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MINERALS YEARBOOK

1956

Volume II of Three Volumes

FUELS

Prepared by the staff of the

BUREAU OF MINES

DIVISION OF PETROLEUM
DIVISION OF BITUMINOUS COAL
DIVISION OF ANTHRACITE

UNITED STATES DEPARTMENT OF THE INTERIOR

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FOREWORD

MINERALS YEARBOOK, 1956, published in three volumes, provides a record of performance of the Nation's mineral industries during the year, with enough background information to interpret the year's developments.

Volume I includes chapters on metal and nonmetal mineral commodities, with the exception of the mineral fuels. Included also are a chapter reviewing these mineral industries, a statistical summary, and chapters on mining technology, metallurgical technology, and employment and injuries.

Volume II includes chapters on each mineral fuel, an employment and injuries presentation, and a mineral-fuels review chapter that summarizes developments in the fuel industries and incorporates all data previously published in the Statistical Summary chapter. Also now included in this review chapter are data on energy production and uses that have previously been included in the Bituminous-Coal chapter.

Volume III is comprised of chapters covering each of the 48 States, plus chapters on the Territory of Hawaii and island possessions in the Pacific Ocean, and the Commonwealth of Puerto Rico and island possessions in the Caribbean Sea, including the Canal Zone. Volume III also has a Statistical Summary chapter, identical with that in volume I, and another presenting employment and injury data.

The data in the Minerals Yearbook are based largely upon information supplied by mineral producers, processors, and users, and acknowledgment is made of this indispensable cooperation given by industry. Information obtained from individuals by means of confidential surveys has been grouped to provide statistical aggregates. Data on individual producers are presented only if available from published or other nonconfidential sources, or when permission of the individuals concerned has been granted.

MARLING J. ANKENY, *Director*.

ACKNOWLEDGMENTS

The chapters in this volume of the MINERALS YEARBOOK were prepared by the staffs of the Division of Anthracite, the Division of Bituminous Coal, and the Division of Petroleum of the Bureau of Mines, and the final printed volume was prepared under editorial supervision by Virgil L. Barr, assistant to the chief, Division of Petroleum, and Thelma Stewart, editorial assistant.

Those chapters dealing with bituminous coal and its products were prepared under the general supervision of T. Reed Scollon, chief, Division of Bituminous Coal, and T. W. Hunter, chief, Branch of Bituminous-Coal Economics and Statistics; the chapters on petroleum and related commodities were prepared under the general supervision of R. A. Cattell, chief, Division of Petroleum, and D. S. Colby, chief, Branch of Petroleum Economics; the anthracite chapter was prepared under the general direction of Joseph A. Corgan, chief, Division of Anthracite; the helium chapter was prepared under the direction of C. W. Seibel, Assistant Director—Helium Activities, and Henry P. Wheeler, Jr., chief, Helium Liaison Office; and data for the Pacific coast were compiled under the direction of E. T. Knudsen, Region II.

Because of the many sources of data presented, it is impossible to give credit to each source individually, but acknowledgment is here made of the ready and willing cooperation of producers and users of fuels who supplied data and of the business press, trade associations, scientific journals, international organizations, and State and Federal agencies. The United States Department of Commerce, Bureau of the Census, furnished data on foreign trade, and the Department of State, United States Foreign Service provided information on foreign production and developments.

The mining and geology and related departments of the respective States and Alaska have been most cooperative and have made available supplementary and verifying information with respect to production and plant operations. For their assistance the Bureau is deeply grateful, and acknowledgment is made to the following State organizations that assisted with the canvasses of bituminous coal and lignite:

Alabama: Division of Safety and Inspection, Birmingham.
Alaska: Territorial Department of Mines, Juneau.
Arizona: State mine inspector, Phoenix.
Arkansas: State mine inspector, Fort Smith.
Colorado: Colorado Coal Mine Inspection Department, Denver.
Georgia: Department of Mines, Mining, and Geology, State Division of Conservation, Atlanta.
Illinois: State Department of Mines and Minerals, Springfield.
Indiana: Bureau of Mines and Mining, Terre Haute.
Iowa: State mine inspectors, Des Moines.
Kansas: State Mine Inspection Division, Pittsburg.
Kentucky: Kentucky Department of Mines and Minerals, Lexington.

Maryland: Maryland Bureau of Mines, Westernport.
Missouri: Division of Mine Inspection, Jefferson City.
New Mexico: State inspector of mines, Albuquerque.
North Dakota: State coal-mine inspector, Bismarck.
Ohio: Division of Mines and Mining, Ohio Department of Industrial Relations, Columbus.
Oklahoma: Chief mine inspector, Oklahoma City.
Pennsylvania: Pennsylvania Department of Mines, Harrisburg.
Tennessee: Tennessee Division of Mines, Knoxville.
Utah: Safety Division, Industrial Commission of Utah, Salt Lake City.
Virginia: Division of Mines, Virginia Department of Labor and Industry, Big Stone Gap.
Washington: Chief coal-mine inspector, Department of Labor and Industries, Seattle.
West Virginia: West Virginia Department of Mines, Charleston.
Wyoming: State coal-mine inspector, Rock Springs.

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Michigan: Department of Conservation, Lansing.
New Jersey: Department of Conservation and Economic Development, Bureau of Geology and Topography, Trenton.
Washington: Department of Conservation and Development, Olympia.

Credit is also due the following State organizations that assisted with the petroleum and natural-gas canvasses:

Arkansas: Arkansas Oil and Gas Commission, El Dorado.
California: California Department of Natural Resources, San Francisco. Public Utilities Commission, State of California, San Francisco.
Illinois: Oil and Gas Division, and State Geological Survey Division, Urbana.
Kansas: State Geological Survey, Lawrence.
Maryland: Department of Geology, Mines, and Water Resources, Baltimore.
Michigan: Geological Survey Division, Department of Conservation, Lansing.
Missouri: Division of Geological Survey and Water Resources, Department of Business and Administration, Rolla.
New York: New York State Science Service, Albany.
North Dakota: North Dakota Geological Survey, Grand Forks.
Ohio: Oil and Gas Section, Department of Natural Resources, Columbus.
Tennessee: Division of Geology, Department of Conservation, Nashville.
Virginia: Geological Survey Division, Department of Conservation and Development, Charlottesville.
West Virginia: Geological and Economic Survey, Morgantown.

Grateful acknowledgment is made to the American Iron and Steel Institute, New York City; the Anthracite Institute, Wilkes-Barre, Pa.; the Association of American Railroads, Washington, D. C.; the Maher Coal Bureau, St. Paul, Minn.; the Ore and Coal Exchange, Cleveland, Ohio; the National Association of Packaged Fuel Manufacturers, Topeka, Kans.; and the many other trade and industry associations that have provided data.

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Contents

PART I. GENERAL REVIEWS

Review of the Mineral-Fuel Industries in 1956

By T. W. Hunter, D. S. Colby, and J. A. Corgan

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GENERAL SUMMARY

TOTAL ENERGY production from mineral fuels and water power in the United States in 1956—41,510 trillion B. t. u.—was the highest in history (6.7 percent over 1955). (See table 1 and fig. 1.) Production of all the major fuels—bituminous coal and lignite, Pennsylvania anthracite, crude petroleum, and natural gas—increased over that in the previous year, as shown in table 2.

The increase in energy production was commensurate with the 5.9-percent rise in gross national product during the year—from 391.7 billion dollars in 1955 to 414.7 billion in 1956. These increases were accompanied by a 2.9-percent increase in the Federal Reserve Board Index of Industrial Production (seasonally adjusted, combined index), which increased from 139 to 143.

Figure 2 indicates the percentages contributed annually by the mineral fuels and waterpower to total energy supplies since 1900, and table 3 shows the calculated consumption of each energy source for 1920–56.

As indicated in table 4, the production of bituminous coal increased to the highest point since the 1952 production of 466.8 million tons, largely because of a 34-percent increase in exports. The output—500.9 million tons—was nearly 8 percent more than in the preceding year, yet was 1.3 percent under the average of 507.5 million tons per year for the postwar period, 1946–54. Anthracite production increased 10.3 percent owing principally to a sharp expansion (303 percent) in exports to overseas destinations. Employment in the coal industry

TABLE 1.—Production of mineral-energy fuels and energy from waterpower (in trillion British thermal units) and percentage contributed by each in continental United States [1]

Year	Bituminous coal and lignite			Anthracite	Crude petroleum	Natural gas, wet	Waterpower	Grand total	Percentage					
	Continental United States	Alaska	Total United States						Bituminous coal and lignite	Anthracite	Crude petroleum	Natural gas, wet	Waterpower	Total
1900	5,563	----------	5,563	1,457	369	254	250	7,893	70.5	18.4	4.7	3.2	3.2	100.0
1901	5,917	----------	5,917	1,714	402	283	264	8,580	68.9	20.0	4.7	3.3	3.1	100.0
1902	6,818	----------	6,818	1,051	515	301	289	8,974	76.0	11.7	5.7	3.4	3.2	100.0
1903	7,408	----------	7,408	1,895	583	319	321	10,526	70.4	18.0	5.5	3.0	3.1	100.0
1904	7,301	----------	7,301	1,858	679	333	354	10,525	69.4	17.6	6.4	3.2	3.4	100.0
1905	8,255	----------	8,255	1,973	781	377	386	11,772	70.1	16.8	6.6	3.2	3.3	100.0
1906	8,983	----------	8,983	1,811	734	418	414	12,360	72.7	14.7	5.9	3.4	3.3	100.0
1907	10,343	----------	10,343	2,174	963	437	441	14,358	72.0	15.1	6.7	3.1	3.1	100.0
1908	8,713	----------	8,713	2,115	1,035	432	476	12,771	68.2	16.6	8.1	3.4	3.7	100.0
1909	9,949	----------	9,949	2,059	1,062	517	513	14,100	70.6	14.6	7.5	3.7	3.6	100.0
1910	10,928	----------	10,928	2,146	1,215	547	539	15,375	71.1	14.0	7.9	3.5	3.5	100.0
1911	10,635	----------	10,635	2,298	1,279	551	565	15,328	69.4	15.0	8.3	3.6	3.7	100.0
1912	11,793	----------	11,793	2,143	1,293	604	585	16,418	71.8	13.0	7.9	3.7	3.6	100.0
1913	12,535	----------	12,535	2,325	1,441	626	609	17,536	71.5	13.2	8.2	3.6	3.5	100.0
1914	11,075	----------	11,075	2,307	1,541	636	636	16,195	68.4	14.3	9.5	3.9	3.9	100.0
1915	11,597	----------	11,597	2,260	1,630	676	659	16,822	69.0	13.4	9.7	4.0	3.9	100.0
1916	13,166	----------	13,166	2,224	1,744	810	681	18,625	70.7	11.9	9.4	4.3	3.7	100.0
1917	14,456	1	14,457	2,530	1,945	855	700	20,487	70.6	12.3	9.5	4.2	3.4	100.0
1918	15,178	2	15,180	2,510	2,064	775	701	21,230	71.5	11.8	9.7	3.7	3.3	100.0
1919	12,204	2	12,206	2,238	2,195	802	718	18,159	67.2	12.3	12.1	4.4	4.0	100.0
1920	14,897	2	14,899	2,276	2,569	883	738	21,365	69.7	10.7	12.0	4.1	3.5	100.0
1921	10,895	2	10,897	2,298	2,739	732	620	17,286	63.0	13.3	15.9	4.2	3.6	100.0
1922	11,061	2	11,063	1,389	3,234	843	643	17,172	64.5	8.1	18.8	4.9	3.7	100.0
1923	14,788	4	14,792	2,371	4,248	1,113	685	23,209	63.7	10.2	18.3	4.8	3.0	100.0
1924	12,670	2	12,672	2,233	4,141	1,263	648	20,957	60.5	10.6	19.8	6.0	3.1	100.0
1925	13,623	2	13,625	1,570	4,430	1,314	668	21,607	63.1	7.2	20.5	6.1	3.1	100.0
1926	15,019	1	15,020	2,145	4,471	1,452	728	23,816	63.1	9.0	18.8	6.1	3.0	100.0
1927	13,563	2	13,565	2,034	5,227	1,598	776	23,200	58.5	8.8	22.5	6.9	3.3	100.0
1928	13,116	4	13,120	1,914	5,229	1,734	854	22,851	57.4	8.4	22.9	7.6	3.7	100.0
1929	14,014	3	14,017	1,875	5,842	2,118	816	24,668	56.8	7.6	23.7	8.6	3.3	100.0
1930	12,246	3	12,249	1,762	5,208	2,148	752	22,119	55.4	8.0	23.5	9.7	3.4	100.0
1931	10,008	3	10,011	1,515	4,936	1,869	668	18,999	52.7	8.0	26.0	9.8	3.5	100.0
1932	8,112	2	8,114	1,266	4,554	1,729	713	16,376	49.5	7.7	27.8	10.6	4.4	100.0
1933	8,739	2	8,741	1,258	5,253	1,733	711	17,696	49.4	7.1	29.7	9.8	4.0	100.0
1934	9,413	2	9,415	1,452	5,267	1,970	698	18,802	50.1	7.7	28.0	10.5	3.7	100.0

1935	9,753	3	9,756	1,325	5,780	2,136	806	19,803	49.2	6.7	29.2	10.8	4.1	100.0
1936	11,501	3	11,504	1,386	6,378	2,411	812	22,491	51.2	6.1	28.4	10.7	3.6	100.0
1937	11,669	4	11,673	1,317	7,419	2,684	871	23,964	48.7	5.5	31.0	11.2	3.6	100.0
1938	9,128	4	9,132	1,171	7,043	2,565	866	20,777	44.0	5.6	33.9	12.3	4.2	100.0
1939	10,341	4	10,345	1,308	7,337	2,763	838	22,591	45.8	5.8	32.5	12.2	3.7	100.0
1940	12,068	4	12,072	1,308	7,849	2,979	880	25,088	48.1	5.2	31.3	11.9	3.5	100.0
1941	13,464	7	13,471	1,432	8,133	3,162	934	27,132	49.6	5.3	30.0	11.7	3.4	100.0
1942	15,260	7	15,267	1,532	8,043	3,436	1,136	29,414	51.9	5.2	27.3	11.7	3.9	100.0
1943	15,455	8	15,463	1,540	8,733	3,839	1,304	30,879	50.1	5.0	28.3	12.4	4.2	100.0
1944	16,224	9	16,233	1,618	9,732	4,176	1,344	33,103	49.0	4.9	29.4	12.6	4.1	100.0
1945	15,126	8	15,134	1,395	9,939	4,423	1,442	32,333	46.8	4.3	30.7	13.7	4.5	100.0
1946	13,979	10	13,989	1,537	10,057	4,550	1,406	31,539	44.3	4.9	31.9	14.4	4.5	100.0
1947	16,513	9	16,522	1,453	10,771	5,012	1,426	35,184	47.0	4.1	30.6	14.2	4.1	100.0
1948	15,697	10	15,707	1,451	11,717	5,615	1,481	35,971	43.7	4.0	32.6	15.6	4.1	100.0
1949	11,461	11	11,472	1,085	10,683	5,911	1,539	30,690	37.4	3.5	34.8	19.3	5.0	100.0
1950	13,517	10	13,527	1,120	11,449	6,841	1,573	34,510	39.2	3.2	33.2	19.8	4.6	100.0
1951	13,969	13	13,982	1,084	13,037	8,106	1,559	37,768	37.0	2.9	34.5	21.5	4.1	100.0
1952	12,213	18	12,231	1,031	13,282	8,705	1,581	36,830	33.2	2.8	36.1	23.6	4.3	100.0
1953	11,958	23	11,981	786	13,671	9,116	1,522	37,076	32.3	2.1	36.9	24.6	4.1	100.0
1954	10,245	17	10,262	739	13,427	9,488	1,449	35,365	29.0	2.1	38.0	26.8	4.1	100.0
1955	12,157	17	12,174	665	14,410	10,204	1,447	38,900	31.3	1.7	37.1	26.2	3.7	100.0
1956	13,104	19	13,123	734	15,181	10,930	1,542	41,510	31.6	1.8	36.6	26.3	3.7	100.0

[1] The unit heat values employed are: Anthracite, 12,700 B. t. u. per pound; bituminous coal and lignite, 13,100 B. t. u. per pound; petroleum, 5,800,000 B. t. u. per barrel; natural gas, total production × 1,075 B. t. u. minus repressuring vent and waste gas × 1,035. Waterpower includes installations owned by manufacturing plants and mines, as well as Government and privately owned public utilities. The fuel equivalent of waterpower is calculated from the kilowatt-hours of power produced wherever available, as it is true of all public-utility plants since 1919. Otherwise, the fuel equivalent is calculated from the reported horsepower of installed water wheels, assuming a capacity factor of 20 percent for factories and mines and 40 percent for public utilities.

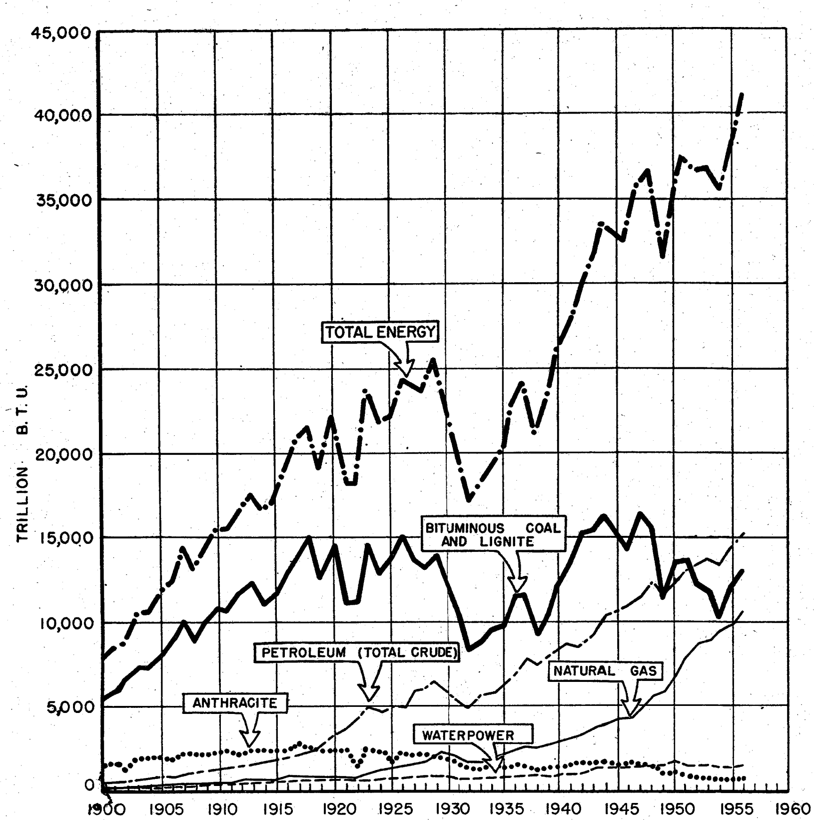

FIGURE 1.—Production of mineral-energy fuels and energy from waterpower in continental United States, 1900–56.

turned upward for the first time in many years, as a result of increased activity in the bituminous-coal industry.

Production of crude oil reached a record high in 1956 (5.3 percent above the level established in 1955). As in 1955, the increased production was from States in the Midcontinent, Rocky Mountain, and Gulf Coast areas. Natural-gas production continued its long-term growth, with a 7.2-percent increase for the year. Drilling effort, as measured by the total number of completions, also increased substantially, with over 57,000.

TABLE 2.—Production of mineral-energy fuels and energy from waterpower in continental United States

Year	Bituminous coal and lignite [1]			Anthracite [1]	Crude petroleum [2]	Natural gas [3]	Electricity from waterpower [4]
	Continental United States	Alaska	Total United States				
1900	212, 315	1	212, 316	57, 368	63, 621	128, 000	2, 786
1901	225, 827	1	225, 828	67, 472	69, 389	180, 000	3, 030
1902	260, 215	2	260, 217	41, 374	88, 767	206, 000	3, 420
1903	282, 748	1	282, 749	74, 607	100, 461	239, 000	3, 927
1904	278, 658	2	278, 660	73, 157	117, 081	257, 000	4, 481
1905	315, 059	4	315, 063	77, 660	134, 717	320, 000	5, 054
1906	342, 869	6	342, 875	71, 282	126, 494	388, 843	5, 613
1907	394, 749	10	394, 759	85, 604	166, 095	406, 622	6, 200
1908	332, 571	3	332, 574	83, 269	178, 527	402, 141	6, 974
1909	379, 741	3	379, 744	81, 070	183, 171	480, 706	7, 848
1910	417, 110	1	417, 111	84, 485	209, 557	509, 155	8, 626
1911	405, 906	1	405, 907	90, 464	220, 449	512, 993	9, 458
1912	450, 105	----------	450, 105	84, 362	222, 935	562, 203	10, 266
1913	478, 433	2	478, 435	91, 525	248, 446	581, 898	11, 229
1914	422, 704	----------	422, 704	90, 822	265, 763	591, 867	12, 229
1915	442, 623	1	442, 624	88, 995	281, 104	628, 579	13, 238
1916	502, 507	13	502, 520	87, 578	300, 767	753, 170	14, 321
1917	551, 737	54	551, 791	99, 612	335, 316	795, 110	15, 399
1918	579, 310	76	579, 386	98, 826	355, 928	721, 001	15, 974
1919	465, 799	61	465, 860	88, 092	378, 367	745, 916	17, 021
1920	568, 606	61	568, 667	89, 598	442, 929	812, 338	18, 779
1921	415, 845	77	415, 922	90, 473	472, 183	673, 770	17, 529
1922	422, 189	79	422, 268	54, 683	557, 531	776, 043	19, 634
1923	564, 445	120	564, 565	93, 339	732, 407	1, 024, 800	21, 788
1924	483, 587	100	483, 687	87, 927	713, 940	1, 161, 726	22, 484
1925	519, 970	83	520, 053	61, 817	763, 743	1, 209, 609	25, 496
1926	573, 280	87	573, 367	84, 437	770, 874	1, 336, 259	29, 249
1027	517, 659	104	517, 763	80, 096	901, 129	1, 471, 012	32, 548
1928	500, 619	126	500, 745	75, 348	901, 474	1, 595, 895	37, 683
1929	534, 888	101	534, 989	73, 828	1, 007, 323	1, 952, 166	37, 524
1930	467, 406	120	467, 526	69, 385	898, 011	1, 978, 911	35, 878
1931	381, 983	106	382, 089	59, 646	851, 081	1, 721, 902	33, 548
1932	309, 607	103	309, 710	49, 855	785, 159	1, 593, 798	36, 529
1933	333, 535	96	333, 631	49, 541	905, 656	1, 596, 673	37, 175
1934	359, 260	108	359, 368	57, 168	908, 065	1, 815, 796	36, 747
1935	372, 254	119	372, 373	52, 159	996, 596	1, 968, 963	42, 727
1936	438, 951	137	439, 088	54, 580	1, 099, 687	2, 225, 477	43, 045
1937	445, 399	132	445, 531	51, 856	1, 279, 160	2, 473, 483	46, 173
1938	348, 390	155	348, 545	46, 099	1, 214, 355	2, 358, 201	47, 219
1939	394, 707	148	394, 855	51, 487	1, 264, 962	2, 538, 383	46, 355
1940	460, 598	174	460, 772	51, 485	1, 353, 214	2, 733, 819	50, 131
1941	513, 910	239	514, 149	56, 368	1, 402, 228	2, 893, 525	53, 207
1942	582, 432	261	582, 693	60, 328	1, 386, 645	3, 145, 694	66, 706
1943	589, 888	289	590, 177	60, 644	1, 505, 613	3, 515, 531	79, 078
1944	619, 228	348	619, 576	63, 701	1, 677, 904	3, 815, 024	78, 905
1945	577, 319	298	577, 617	54, 934	1, 713, 655	4, 042, 002	84, 747
1946	533, 555	367	533, 922	60, 507	1, 733, 939	4, 152, 762	83, 150
1947	630, 263	361	630, 624	57, 190	1, 856, 987	4, 582, 173	83, 066
1948	599, 110	408	599, 518	57, 140	2, 020, 185	5, 148, 020	86, 992
1949	437, 434	434	437, 868	42, 702	1, 841, 940	5, 419, 736	94, 773
1950	515, 899	412	516, 311	44, 077	1, 973, 574	6, 282, 060	100, 885
1951	533, 171	494	533, 665	42, 670	2, 247, 711	7, 457, 359	104, 376
1952	466, 155	686	466, 841	40, 583	2, 289, 836	8, 013, 457	109, 708
1953	456, 429	861	457, 290	30, 949	2, 357, 082	8, 396, 916	109, 617
1954	391, 039	667	391, 706	29, 100	2, 314, 988	8, 742, 546	111, 640
1955	463, 994	640	464, 634	26, 200	2, 484, 428	9, 405, 351	116, 236
1956	500, 147	727	500, 874	28, 900	2, 617, 283	10, 081, 982	125, 227

[1] Thousand net tons.
[2] Thousand barrels; crude petroleum and commingled condensate.
[3] Million cubic feet; total production minus repressuring, vent, and waste.
[4] Million kilowatt-hours; 1920–42 represents fuel equivalent of waterpower converted to kilowatt-hours at the prevaling rate of pounds of coal per kilowatt-hour at central electric stations. Years since 1942 represent production of electricity by waterpower at electric-utility and industrial plants, as published by Federal Power Commission.

TABLE 3.—Calculated consumption of energy fuels and energy from waterpower (in trillion British thermal units) and percentage contributed by each in the continental United States [1]

Year	Bituminous coal and lignite	Anthracite	Crude oil	Petroleum products net: E, exported; I, imported	Natural gas dry	Natural-gas liquids	Waterpower	Grand total	Percentage: Bituminous coal and lignite	Percentage: Anthracite	Percentage: Crude oil	Percentage: Petroleum products net: E, exported; I, imported	Percentage: Natural gas dry	Percentage: Natural-gas liquids	Percentage: Waterpower	Percentage: Total
1920	13,325	2,179	3,027	E 393	827	42	775	19,782	67.4	11.0	15.3	E 2.0	4.2	0.2	3.9	100.0
1921	10,266	2,082	3,016	E 342	682	50	656	16,410	62.6	12.7	18.4	E 2.1	4.1	.3	4.0	100.0
1922	11,185	1,443	3,390	E 319	785	56	675	17,215	65.0	8.4	19.7	E 1.9	4.6	.3	3.9	100.0
1923	13,598	2,208	4,419	E 389	1,032	90	727	21,685	62.7	10.2	20.4	E 1.8	4.8	.4	3.3	100.0
1924	12,681	2,050	4,228	E 464	1,170	103	685	20,453	62.0	10.0	20.7	E 2.3	5.7	.5	3.4	100.0
1925	13,079	1,627	4,641	E 485	1,212	124	701	20,899	62.6	7.8	22.2	E 2.3	5.8	.6	3.3	100.0
1926	13,954	1,961	4,876	E 545	1,335	149	765	22,495	62.0	8.7	21.7	E 2.4	5.9	.7	3.4	100.0
1927	13,095	1,897	5,027	E 650	1,465	179	815	21,828	60.0	8.7	23.0	E 3.0	6.7	.8	3.8	100.0
1928	13,069	1,871	5,474	E 711	1,588	200	890	22,381	58.4	8.4	24.4	E 3.2	7.1	.9	4.0	100.0
1929	13,612	1,815	5,894	E 600	1,942	246	847	23,756	57.3	7.6	24.8	E 2.5	8.2	1.0	3.6	100.0
1930	11,921	1,718	6,148	E 496	1,969	243	785	22,288	53.5	7.7	27.6	E 2.2	8.8	1.1	3.5	100.0
1931	9,743	1,484	5,304	E 339	1,715	200	692	18,799	51.8	7.9	28.2	E 1.8	9.1	1.1	3.7	100.0
1932	8,041	1,283	4,830	E 240	1,594	158	726	16,392	49.1	7.8	29.5	E 1.5	9.7	1.0	4.4	100.0
1933	8,323	1,260	5,143	E 299	1,600	144	729	16,900	49.2	7.5	30.4	E 1.8	9.5	.9	4.3	100.0
1934	9,008	1,410	5,136	E 318	1,819	161	721	17,937	50.2	7.9	28.6	E 1.8	10.2	.9	4.0	100.0
1935	9,336	1,298	5,799	E 300	1,974	169	831	19,107	48.9	6.8	30.4	E 1.6	10.3	.9	4.3	100.0
1936	10,697	1,351	6,426	E 302	2,221	184	841	21,428	49.9	6.3	30.0	E 1.4	10.4	.9	3.9	100.0
1937	11,286	1,280	7,004	E 400	2,468	208	905	22,751	49.6	5.6	30.8	E 1.7	10.8	.9	4.0	100.0
1938	8,811	1,148	6,921	E 456	2,348	209	899	19,880	44.3	5.8	34.8	E 2.3	11.8	1.1	4.5	100.0
1939	9,854	1,262	7,327	E 486	2,539	221	872	21,589	45.6	5.9	33.9	E 2.2	11.8	1.0	4.0	100.0
1940	11,290	1,245	7,662	E 175	2,726	243	917	23,908	47.2	5.2	32.1	E .7	11.4	1.0	3.8	100.0
1941	12,893	1,338	8,343	E 139	2,851	364	975	26,625	48.4	5.0	31.3	E .5	10.7	1.4	3.7	100.0
1942	14,149	1,435	7,987	E 320	3,102	367	1,177	27,897	50.7	5.2	28.6	E 1.1	11.1	1.3	4.2	100.0
1943	15,557	1,450	8,538	E 310	3,481	379	1,347	30,442	51.1	4.8	28.1	E 1.0	11.4	1.2	4.4	100.0
1944	15,447	1,509	9,923	E 662	3,775	442	1,387	31,821	48.5	4.7	31.2	E 2.1	11.9	1.4	4.4	100.0
1945	14,661	1,311	10,199	E 580	3,973	491	1,486	31,541	46.5	4.2	32.3	E 1.8	12.6	1.5	4.7	100.0
1946	13,110	1,369	10,270	E 283	4,089	493	1,446	30,494	43.0	4.5	33.7	E .9	13.4	1.6	4.7	100.0
1947	14,302	1,224	11,065	E 262	4,518	564	1,459	32,870	43.5	3.7	33.7	E .8	13.8	1.7	4.4	100.0
1948	13,622	1,275	12,085	E 147	5,033	619	1,507	33,994	40.1	3.8	35.5	E .4	14.8	1.8	4.4	100.0
1949	11,673	958	11,402	I 57	5,289	660	1,565	31,604	36.9	3.0	36.1	I .2	16.7	2.1	5.0	100.0

1950	11,900	1,013	12,304	I 402	6,150	783	1,601	34,153	34.8	3.0	36.0	I 1.2	18.0	2.3	4.7	100.0
1951	12,285	940	13,867	I 107	7,248	874	1,592	36,913	33.3	2.5	37.6	. .3	19.6	2.4	4.3	100.0
1952	10,971	897	14,248	I 132	7,760	954	1,614	36,576	30.0	2.4	39.0	I .4	21.2	2.6	4.4	100.0
1953	11,182	711	14,912	I 180	8,156	1,006	1,550	37,697	29.7	1.9	39.5	I .5	21.6	2.7	4.1	100.0
1954	9,512	683	14,830	I 260	8,554	1,042	1,479	36,360	26.2	1.9	40.8	I .7	23.5	2.8	4.1	100.0
1955	11,104	599	15,956	I 372	9,232	1,196	1,497	39,956	27.8	1.5	39.9	I .9	23.1	3.0	3.8	100.0
1956	11,338	610	16,994	I 424	9,834	1,209	1,598	42,007	27.0	1.4	40.5	I 1.0	23.4	2.9	3.8	100.0

[1] The heat values employed, which apply to data in table 3 are: Anthracite, 12,700 B. t.u. per pound; bituminous coal and lignite, 13,100 B. t. u. per pound; crude oil, 5,800,000 B. t. u. per barrel; weighted average British thermal units on petroleum products by using 5,248,000 gasoline, 5,670,000 kerosine, 5,825,000 distillate, 6,287,000 residual, 6,064,800 lubricants, 5,537,280 wax, 6,636,000 asphalt, and 5,796,000 miscellaneous; natural gas dry, 1,035 B. t. u. per cubic foot; natural-gas liquids weighted average British thermal units based on production; natural gasoline, 110,000 B. t. u. per gallon; and LP-gas, 95,500 B. t. u. per gallon. Waterpower converted to coal equivalent at the prevailing rate of pounds of coal per kilowatt-hour each year at central electric stations.

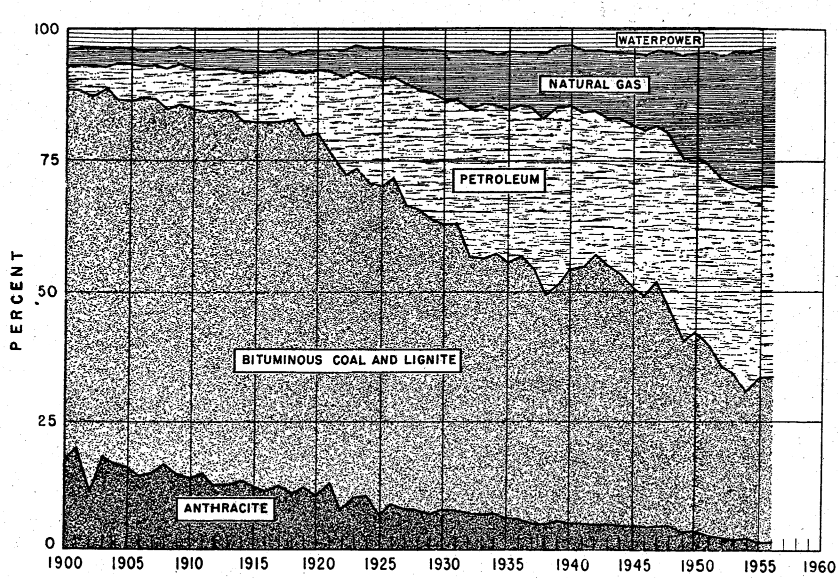

FIGURE 2.—Percentage of total production of British thermal units equivalent of mineral-energy fuels and energy from waterpower in continental United States, 1900–56.

TABLE 4.—Salient statistics of the fuel industries in the United States, 1955–56

	1955	1956	Change from 1955 (percent)
Production:			
Bituminous coal......million net tons..	464.6	500.9	+7.8
Crude petroleum......million bbl..	2,484.4	2,617.3	+5.3
Natural gas, marketed production......billion cubic feet..	9,405.4	10,081.9	+7.2
Anthracite......million net tons..	26.2	28.9	+10.3
Value of production:			
Bituminous coal, f. o. b. mines or plants......million dollars..	2,092.4	2,412.0	+15.3
Crude petroleum, value of production at wells......do....	6,870.4	7,262.9	+5.7
Natural gas, value at wells......do....	978.4	1,083.8	+10.8
Anthracite, f. o. b. mines or plants......do....	206.1	236.8	+14.9
Consumption (apparent):			
Bituminous coal......million net tons..	423.4	432.9	+2.2
Crude petroleum, runs to stills......million bbl..	2,730.2	2,905.1	+6.4
Natural gas......billion cubic feet..	9,070.3	9,706.9	+7.0
Anthracite......million net tons..	23.6	24.0	+1.7
Stocks, year end:			
Bituminous coal......do....	72.6	82.9	+14.2
Crude petroleum......million bbl..	265.6	266.0	+.2
Natural gas......billion cubic feet [1]..	1,368.3	1,502.2	+9.8
Anthracite......million net tons [2]..	1.9	1.8	−5.3
Imports:			
Bituminous coal......do [3]....	.3	.4	+5.5
Crude petroleum......million bbl [4]..	285.4	341.8	+19.8
Natural gas......billion cubic feet [4]..	10.9	10.4	−4.6
Anthracite......thousand net tons [3]..	.2	.05	−75.0
Exports:			
Bituminous coal......do [3]....	51.3	68.5	+33.7
Crude petroleum......million bbl [3]..	11.6	28.6	+146.6
Natural gas......billion cubic feet [4]..	31.0	36.0	+16.1
Anthracite......million net tons [3]..	3.2	5.2	+66.4
Employment:			
Bituminous coal (average number of men working daily), in thousand..	225.1	228.2	+1.4
Crude-petroleum and natural-gas production (annual average in thousand) [5]......	317.1	330.8	+4.3
Anthracite (average number of men working daily), in thousand......	33.5	31.5	−6.0

[1] American Gas Association.
[2] Producers and estimated retail-dealer stocks only.
[3] U. S. Department of Commerce.
[4] Bureau of Mines data.
[5] Bureau of Labor Statistics, U. S. Department of Labor.

CONSUMPTION

Bituminous-coal consumption increased 2.2 percent in 1956, largely because of an increase of over 14 million tons by electric-power utilities and smaller gains at cement mills and other industrial plants. A 5-million-ton decline in consumption at coke plants and railroads and in retail-dealer deliveries tended to retard the upward trend in consumption. Exports of bituminous coal increased 17.2 million tons over the 1955 level.

The anthracite industry gained 2 percent in apparent consumption and over 66 percent in total exports.

The demand for petroleum products continued to increase in 1956 but at a slower rate than in 1955. Refiners, expecting an increase in demand comparable to 1955, maintained high crude runs throughout the year. The demand dropped during the latter half of the year, however; consequently, stocks of refined products at the close of 1956 were 58.1 million barrels higher.

TABLE 5.—Consumption of bituminous coal and lignite in the United States, 1955–56, by major consumer groups

(Thousand net tons)

Year	Electric power utilities [1]	Class 1 railroads [2]	Coke plants	Steel and rolling mills	Cement mills	Other industries	Retail deliveries	Bunker foreign trade [3]	Total
1955	140, 550	15, 473	107, 377	5, 221	8, 728	91, 856	53, 762	445	423, 412
1956	154, 983	12, 308	105, 913	5, 109	9, 270	95, 650	49, 125	500	432, 858

[1] Federal Power Commission.
[2] Association of American Railroads.
[3] Bureau of Census, U. S. Department of Commerce.

TABLE 6.—Sales of fuel oil and natural gas in the United States, 1955–56, by major consumer groups

(Fuel oils—thousand barrels; natural gas—million cubic feet)

	Railroads	Vessels	Gas and electric power-plants	Smelters, mines, and manufactures	Space heating and cooking	Military	Oil-company fuel	Miscellaneous	Total
Distillate fuel oil:									
1955	84, 668	16, 675	5, 884	43, 606	356, 589	10, 945	8, 597	54, 163	581, 127
1956	89, 439	18, 487	5, 403	44, 949	377, 262	11, 326	10, 131	58, 778	615, 775
Residual fuel oil:									
1955	15, 018	115, 128	75, 966	173, 030	86, 262	28, 368	53, 387	9, 804	556, 983
1956	10, 575	117, 445	73, 962	177, 807	87, 601	30, 546	53, 271	10, 331	561, 538
Natural gas:									
1955			[1] 1, 153, 280	3, 939, 464	2, 753, 171		2, 132, 914		8, 825, 549
1956			[1] 1, 239, 311	4, 319, 952	3, 044, 435		2, 099, 893		9, 464, 280

[1] Memorandum entry, not additive; includes gas other than natural. Natural-gas component included under "smelters, mines, and manufactures."

EMPLOYMENT AND WORKING TIME

The average number of employees working daily in the bituminous-coal industry increased for the first time since 1948. The increase over 1955 was 1.38 percent. Employment in the anthracite industry continued to decline and dropped approximately 6 percent from 1955. The average daily working force in the bituminous-coal and lignite industry in 1956 totaled 228,163 men, compared with 225,093 in 1955. In the anthracite industry the decline was from 33,523 men to 31,516. Because of competitive pressures for continually advancing efficiency in coal production, it is significant that the net tons mined per man-day in the bituminous-coal and lignite industry was 10.28, compared with 9.84 in 1955—an increase of 4.5 percent. The output per man-year increased from 2,604 tons to 2,195, the highest in history.

In the anthracite industry the output per man-day established a new record of 4.25 tons, compared with the previous high of 4.02 tons in 1954. The output per man per year was 918 net tons in 1956, compared with 780 in 1955.

Total employment in the petroleum production and refining industry during 1956 was 580,600, about 13 percent more than in the preceding year. Of this total, 330,800 were in the production division and 249,800 were engaged in refining.

Average weekly hours worked in 1956 in the bituminous-coal industry increased slightly—from 37.6 in 1955 to 37.7. For the anthracite industry, the average weekly hours worked in 1956 totaled 33.2, compared with 33.4 in the preceding year. In 1956 the bituminous-coal industry averaged 214 days of work, as against 210 days in 1955, while in the anthracite industry the average number of days worked increased from 197 to 216.

Wages strongly influence total production costs in the fuel industries. Accordingly, wage increases granted by the respective mineral-fuel industries are significant. In 1956, hourly earnings in the bituminous-coal industry increased 9.8 percent from 1955 and in the anthracite industry, 4.3 percent. In petroleum and natural-gas production earnings increased 6.9 percent. Hourly earnings in the anthracite industry in 1956 were \$2.64, in the bituminous-coal industry \$2.81, and in the petroleum and natural-gas industry \$2.48. Weekly earnings in the bituminous-coal industry were the highest of the three, \$106.03, followed by petroleum and natural gas with \$101.77 and anthracite with \$87.65.

TABLE 7.—Hours worked and gross earnings of production workers in the fuel industries, 1952–56 [1]

	1952	1953	1954	1955	1956
Bituminous coal:					
Average weekly earnings	\$78.09	\$85.31	\$80.85	\$96.26	\$106.03
Average weekly hours	34.1	34.4	32.6	37.6	37.7
Average hourly earnings	\$2.29	\$2.48	\$2.48	\$2.56	\$2.81
Anthracite:					
Average weekly earnings	\$71.19	\$72.91	\$75.05	\$84.50	\$87.65
Average weekly hours	31.5	29.4	29.9	33.4	33.2
Average hourly earnings	\$2.26	\$2.48	\$2.51	\$2.53	\$2.64
Petroleum and natural gas production (except contract services):					
Average weekly earnings	\$85.90	\$90.39	\$91.94	\$95.94	\$101.77
Average weekly hours	41.1	40.9	40.5	40.6	41.0
Average hourly earnings	\$2.09	\$2.21	\$2.27	\$2.32	\$2.48

[1] Bureau of Labor Statistics, U. S. Department of Labor.

FUEL PRICES

The index of wholesale prices for all commodities increased from 110.7 in 1955 to 114.3 in 1956 (see table 8). The average value per ton, f. o. b. mines, for bituminous coal increased to $4.82 from $4.50 and for anthracite to $8.19 from $7.86. The average price per barrel at the well for crude petroleum in 1955—$2.77—remained the same in 1956.

For natural gas the 1956 average price per thousand cubic feet at the well—10.8 cents—was 0.4 cent higher than in 1955.

The index of wholesale prices for petroleum and petroleum products in 1956 was 118.2 percent of the 1947–49 base and 4.9 percent above the 1955 figure.

TABLE 8.—Average monthly wholesale price indexes for fuels, 1951–56 [1]

(1947–49=100)

	1951	1952	1953	1954	1955	1956
Gas	100.7	103.7	107.8	108.8	111.6	115.1
Petroleum and petroleum products	110.5	109.3	112.7	110.8	112.7	118.2
Coal	108.4	108.7	112.8	106.3	104.8	114.5
Average index for all commodities	114.8	111.6	110.1	110.3	110.7	114.3

[1] Bureau of Labor Statistics, U. S. Department of Labor.

One of the major factors that affected the competitive relationship between and among the respective mineral fuels significantly is transportation cost. For example, 76.6 percent of all bituminous coal was shipped from the mines via railroads in 1956 at rates that added 72 percent to the coal cost f. o. b. mines. The average railroad freight-rate charge per net ton on bituminous coal and lignite in 1956 was $3.45, an increase of 21 cents per ton over 1955.

TABLE 9.—Comparative fuel prices, 1955–56

Fuel	1955	1956
Bituminous coal:		
Average wholesale prices, dollars per net ton: [1]		
Large domestic sizes, f. o. b. car at mine, to retail dealer	6.82	7.10
Domestic stoker, f. o. b. car at mine, to retail dealers	6.24	6.62
Screenings for industrial use, f. o. b. car at mine, to industrial consumers	4.53	5.08
Metallurgical coal, f. o. b. car at mine, to coke manufacturers	5.62	6.19
Other average prices, dollars per net ton:		
Railroad fuel, f. o. b. mine [2]	4.65	5.03
Average retail price [1]	15.10	15.65
Cost of coal at merchant coke ovens	9.16	9.85
Anthracite, average sales realization per net ton on shipments to points outside regions, excluding dredge coal, dollars:		
Chestnut	11.36	12.07
Pea	8.12	8.95
Buckwheat No. 1	6.49	7.16
Petroleum and petroleum products:		
Crude petroleum, average price per barrel at well ... dollars	2.77	2.77
Gasoline, average dealers' net price (excluding taxes) of gasoline in 50 U. S. cities ... cents per gallon [3]	16.18	16.34
Residual fuel oil:		
No. 6 fuel oil, average of high and low prices in Philadelphia ... dollars per barrel (refinery) [3]	2.60	2.96
Bunker C, average price for all Gulf ports ... do [3]	2.04	2.19
Distillate, fuel oil:		
No. 2 distillate, average of high and low prices at Philadelphia ... cents per gallon (refinery) [3]	9.9	10.4
No. 2 distillate, average for all Gulf ports ... do [3]	8.9	9.2
Natural gas:		
Average U. S. value, at well ... cents per thousand cubic feet	10.4	10.8
Average U. S. value, at points of consumption ... do	40.0	41.5
Average wholesale price index for all commodities [1]	110.7	114.3

[1] Bureau of Labor Statistics, U. S. Department of Labor, Wholesale Prices and Price Indexes.
[2] Interstate Commerce Commission.
[3] Platt's Oil Price Handbook.

A less tangible factor in fuels competition is convenience of use. Much of the advancement made by natural gas has resulted from this important factor.

NATIONAL INCOME ORIGINATED; WAGES AND SALARIES

National income originated during the year increased 6.0 percent. Increases in the respective mineral-fuel industries were as follows: 16.9 percent in the bituminous-coal and lignite industries; 19.4 percent in the anthracite industry; and 7.0 percent in the petroleum and natural-gas industries.

Total United States wages and salaries increased 8.0 percent. Wages and salaries increased 15.0 percent in the bituminous-coal industry, 9.4 percent in the petroleum and natural gas industries, and 4.2 percent in the anthracite industry.

TABLE 10.—National income originated and wages and salaries in the fuel industries, 1953–56 [1]

	Million dollars			
	1953	1954	1955	1956
National income originated:				
Bituminous and other soft-coal mining	1,492	1,143	1,266	1,480
Anthracite	201	159	139	166
Crude petroleum and natural gas	2,404	2,164	2,327	2,491
Total	4,097	3,466	3,732	4,137
United States national income	302,129	298,955	324,068	343,620
Total as a percent of U. S. national income	1.36	1.16	1.15	1.20
Wages and salaries:				
Bituminous and other soft-coal mining	1,206	916	993	1,142
Anthracite	183	142	120	125
Crude petroleum and natural gas	1,374	1,431	1,548	1,694
Total	2,763	2,489	2,661	2,961
Total United States wages and salaries	197,287	195,513	210,339	227,237
Total as a percent of total United States wages and salaries	1.40	1.27	1.27	1.30

[1] Office of Business Economics, U. S. Department of Commerce, Survey of Current Business.

ENERGY FUELS IN INTERNATIONAL TRADE

In 1956 the United States foreign coal trade reached the second highest record in history, as a total of 73.8 million net tons (bituminous and anthracite) was exported, representing an increase of 19.4 million tons (about 36 percent) when compared to 1955.

Europe and Canada, the two ranking importers of United States-produced coal, received 43.9 and 23.1 million net tons, respectively—increases of about 50 and 17 percent over 1955. Exports to South America were approximately 1 million tons higher than in 1955. Exports to Asia and Africa were off approximately 217,000 and 174,000 tons, respectively.

The continued growth of European energy demands throughout 1956 created a sharp upward trend in markets for United States coal. At the close of the year, Europe's requirements for imported coal remained strong, and forecasts by the Organization of European

TABLE 11.—Coal exported from the United States, by continents, 1955–56

	1955		1956	
	Bituminous	Anthracite	Bituminous	Anthracite
	(Thousand net tons)		(Thousand net tons)	
North and Central America	17,286	2,499	20,713	2,427
South America	1,447	1	2,821	18
Europe	28,669	591	41,167	2,723
Asia	3,726	61	3,509	76
Africa	139	0	313	0
Undesignated	3	0	33	0
Total	51,270	3,152	68,556	5,244

Source: Bureau of Census, U. S. Department of Commerce.

Economic Cooperation for 1957 indicate even higher demand levels for United States coal imports. Authoritative sources in Europe report that as long as no significant general economic or military disruptions occur, the United States will continue to be the principal exporter of coal to Europe for many years.

As the coal industry in Europe could not increase production to meet the expanding coal requirements of 1956, imports from the United States became progressively more important. The events leading to closing of the Suez Canal in late 1956 added to the gravity of the European coal-supply situation. The difficulty of obtaining oil supplies was reflected in further increased demand for coal to replace oil.

In 1956 the European Coal and Steel Community (Belgium, France, Italy, Luxembourg, Netherlands, Saar, and West Germany) share of the total European imports of United States coal was 35.5 million net tons. West Germany was the principal consumer of American coal in 1956, taking about 10.3 million tons or 14 percent of total United States exports.

Over 23 million net tons was exported to Canada—the largest individual foreign destination for American coal. Canada received 31.2 percent of the total coal exports from the United States in 1956.

Shipments to Argentina and Brazil represented the major portion of coal exports to South American destinations in 1956. The combined coal exports to these countries amounted to 88 percent of the South American trade and approximately 3 percent of the total United States coal exports.

Japan and the Republic of Korea were the principal Asiatic importers of American coal. Of the 3.6 million net tons exported to this area in 1956, Japan's share amounted to 3.2 million tons, while the Republic of Korea took 280,000 tons. The remaining tonnage exported to Asia went to Indonesia and Vietnam.

Exports to Africa included large shipments to Angola, which received 129,000 net tons of United States coal for transshipment to Northern Rhodesia, where indigenous fuels were in short supply. Algeria, Egypt, and Morocco ranked next, in that order, as importers of coal from the United States.

United States exports of crude petroleum and refined products for the first 10 months of 1956 were below the 1955 average. In November 1956, however, the Egyptian Government closed the Suez Canal, and emergency shipments from the United States to relieve the petroleum shortage in Europe caused the year's total to exceed that in 1955. These emergency shipments were, for the most part, crude oil, gasoline, and distillate fuel oil. Exports from continental United States averaged 429,000 barrels daily in 1956, with daily shipments for the last 2 months averaging 856,000 barrels.

In 1956 imports of petroleum into continental United States continued to increase and were 14.3 percent above 1955, averaging 1.4 million barrels per day. Imports accounted for 15.4 percent of the total supply, compared with 14.4 percent in 1955. Crude oil and residual fuel oil were the principal oils imported and represented 65 and 31 percent of the total, respectively. Net imports (imports minus exports) into continental United States averaged 1,016,000 barrels daily in 1956, compared with 900,000 barrels in 1955.

According to the United States Department of Commerce, crude-petroleum imports averaged 944,000 barrels daily, an 18-percent increase over 1955. Venezuela supplied 51 percent of the crude-oil imports. Receipts from Canada by pipeline more than doubled in 1956, as refineries in the Minnesota-Wisconsin and West Coast districts sharply increased the use of Canadian crude.

Residual fuel-oil imports were 10 million barrels higher than in 1955. and came chiefly from Venezuela and the Netherland Antilles.

WORLD PRODUCTION OF COAL

Estimated world coal production in 1956 was 2,482 million net tons—an increase over 1955 of 129 million tons, or about 5.5 percent. Of the total 1956 coal production, 1,700 million tons was bituminous, 157 million tons anthracite, and 625 million tons lignite.

TABLE 12.—World coal production, by continents, 1956

Continent	Production (million net tons)	Continent	Production (million net tons)
North America	546	Asia:	
South America	7	Free countries	118
Europe:		Communist China and North Vietnam	117
Free countries	683	Africa	44
Soviet Bloc countries	931	Oceania	36
		Total	2,482

The most notable increase in 1956 was reported from the U. S. S. R. where coal production was approximately 42 million net tons greater than in 1955. The next largest increase in output was in the United States, where production was 39 million tons greater.

Of the total world increase (129 million net tons), the Soviet Bloc countries (including Communist China), furnished approximately 50 percent. The increased coal output of these countries (in million net tons) follows: U. S. S. R., 41.8; Communist China, 13.4; Czechoslovakia, 5.1; and Poland, 0.9. The combined 1956 production of Albania, Bulgaria, Hungary, and North Vietnam was about 1 million tons less than in 1955.

The only free countries of Europe to make significant coal-production increases above 1955 were West Germany and Yugoslavia, where production rose 9.5 and 3.2 million tons, respectively. Small declines, varying from 0.2 to 0.5 million tons, were noted in the 1956 output of Belgium, France, and the Saar.

Asia's production in 1956 was approximately 22 million net tons higher than in 1955. Of this amount, Communist China supplied 13.4 million tons of the increase. Other Asiatic countries reporting significantly increased output in 1956 were Japan (up 4.6 million tons) and India (up 1.4 million tons). Other small but significant increases in output were reported from North and South Korea, Taiwan, and Turkey.

The African coal industry reflected a continued strong position in 1956, as production increased about 2 million net tons. The Union of South Africa increased production 1.6 million tons and Southern Rhodesia 0.3 million tons. Algeria, French Morocco, Mozambique, and Nigeria also made small increases in output, whereas in the Belgian Congo it declined 66 thousand tons.

Oceania reported only small gains for the year.

COMPARATIVE STATISTICAL SUMMARY

Tables in this chapter summarize mineral-fuels production in continental United States (defined as the 48 States and the District of Columbia), by individual fuels, both in terms of quantity and in value of production. The total value of all mineral production, including mineral fuels, is also shown to provide an integrated summary of the mineral industries during 1956. For a detailed summary of all minerals other than fuels, see volume I of Minerals Yearbook.

The value of all mineral production, by States, is stated in table 15. Bituminous-coal production includes all marketable production, excluding washery and other refuse, while anthracite production is measured at the sizing and cleaning stage.

Crude petroleum is measured at the time it is removed from the producing property, and natural-gas liquids are measured in the form in which they are shipped from natural-gasoline or cycle plants. For precise description of the stage of measurement, see the individual commodity chapters.

World production and the proportion of the total produced by the United States are listed in table 16.

TABLE 13.—Value of mineral production in continental United States, 1925–56, by mineral groups

(Million dollars)

Year	Mineral fuels	Nonmetallic minerals (except fuels)	Metals	Total
1925	2,910	1,187	715	4,812
1926	3,371	1,219	721	5,311
1927	2,875	1,201	622	4,698
1928	2,666	1,163	655	4,484
1929	2,940	1,166	802	4,980
1930	2,500	973	507	3,980
1931	1,620	671	287	2,578
1932	1,460	412	128	2,000
1933	1,413	432	205	2,050
1934	1,947	520	277	2,744
1935	2,013	564	365	2,942
1936	2,405	685	516	3,606
1937	2,798	711	756	4,265
1938	2,436	622	460	3,518
1939	2,423	754	631	3,808
1940	2,662	784	752	4,198
1941	3,228	989	890	5,107
1942	3,568	1,056	999	5,623
1943	4,028	916	987	5,931
1944	4,574	836	900	6,310
1945	4,569	888	774	6,231
1946	5,090	1,243	729	7,062
1947	7,188	1,338	1,084	9,610
1948	9,502	1,552	1,219	12,273
1949	7,920	1,559	1,101	10,580
1950	8,689	1,822	1,351	11,862
1951	9,779	2,079	1,671	13,529
1952	9,615	2,163	1,614	13,392
1953	10,257	2,350	1,811	14,418
1954	9,918	2,629	1,518	14,065
1955	10,780	2,969	2,055	15,804
1956	11,708	3,276	2,362	17,346

TABLE 14.—Mineral-fuels production in continental United States, 1953–56, by individual fuels

	1953		1954	
	Quantity	Value (thousand dollars)	Quantity	Value (thousand dollars)
Petroleum asphalt: Bituminous limestone and sandstone ---- short tons	1,440,544	4,349	1,337,822	3,686
Gilsonite ---- do	60,505	2,184	75,943	2,724
Carbon dioxide, natural (estimated) ---- thousand cubic feet	670,600	203	638,900	211
Coal:				
Bituminous [1] ---- thousand short tons	454,439	2,241,150	387,463	1,759,290
Lignite ---- do	2,851	6,794	4,243	10,330
Pennsylvania anthracite ---- do	30,949	299,140	29,083	247,870
Helium (shipments) ---- thousand cubic feet	157,652	2,103	189,873	3,202
Natural gas ---- million cubic feet	8,396,916	774,966	8,742,546	882,501
Natural gas liquids:				
Natural gasoline and cycle products ---- thousand gallons	5,327,448	406,242	5,385,282	402,418
LP-gases ---- do	4,692,870	191,598	5,204,304	178,994
Peat ---- short tons	204,209	1,618	244,163	2,258
Petroleum (crude) ---- thousand barrels	2,357,082	6,327,100	2,314,988	6,424,930
Total mineral fuels	----	10,257,000	----	9,918,000
Total all other minerals	----	4,161,000	----	4,147,000
Grand total, mineral production	----	14,418,000	----	14,065,000

	1955		1956	
	Quantity	Value (thousand dollars)	Quantity	Value (thousand dollars)
Petroleum asphalt: Bituminous limestone and sandstone ---- short tons	1,427,207	4,111	1,458,533	4,114
Gilsonite ---- do	82,822	3,117	89,003	3,822
Carbon dioxide, natural (estimated) ---- thousand cubic feet	702,417	234	713,030	235
Coal:				
Bituminous [1] ---- thousand short tons	464,633	2,092,383	500,874	2,412,004
Lignite ---- do				
Pennsylvania anthracite ---- do	26,205	206,097	28,900	236,785
Helium (shipments) ---- thousand cubic feet	235,868	3,881	266,937	4,413
Natural gas ---- million cubic feet	9,405,351	978,357	10,081,923	1,083,812
Natural gas liquids:				
Natural gasoline and cycle products ---- thousand gallons	5,844,904	423,775	5,807,100	431,958
LP-gases ---- do	5,972,698	195,231	6,487,413	265,185
Peat ---- short tons	273,669	2,283	292,097	2,460
Petroleum (crude) ---- thousand barrels	2,484,428	[2] 6,870,380	2,617,432	7,263,463
Total mineral fuels	----	10,780,000	----	11,708,000
Total all other minerals	----	5,024,000	----	5,638,000
Grand total, mineral production	----	15,804,000	----	17,346,000

[1] Includes small quantity of anthracite mined in States other than Pennsylvania; includes Alaska.
[2] Owing to difference in rounding procedure, this total may vary slightly from data shown in Minerals Yearbook, volume III, table 2.

TABLE 15.—Value of mineral production in the United States,[1] 1953–56, by States, in thousand dollars, and principal minerals produced in 1956

State	1953	1954	1955	1956			
				Value	Rank	Percent of U. S. total	Principal minerals in order of value
Alabama	187,087	154,639	186,453	189,186	22	1.09	Coal, cement, iron ore, stone.
Alaska	24,252	24,408	25,412	23,408	42	.13	Gold, coal, sand and gravel, platinum-group metals.
Arizona	258,471	254,479	378,277	485,751	11	2.80	Copper, cement, zinc, uranium.
Arkansas	127,090	131,745	132,822	135,209	26	.78	Petroleum, bauxite, sand and gravel, stone.
California	1,393,987	1,429,627	1,456,513	1,555,263	2	8.97	Petroleum, cement, natural gas, natural-gas liquids.
Colorado	212,690	255,852	286,219	329,451	16	1.90	Petroleum, molybdenum, coal, cement.
Connecticut	7,917	9,581	10,428	11,876	46	.07	Stone, sand and gravel, lime, clays.
Delaware	659	947	1,658	1,232	50	.01	Sand and gravel, stone, clays.
Florida	92,336	106,510	108,957	140,490	24	.81	Phosphate rock, stone, cement, titanium concentrate.
Georgia	51,395	55,828	60,417	67,912	31	.39	Clays, stone, cement, sand and gravel.
Hawaii	3,332	3,596	3,592	6,972	47	.04	Stone, sand and gravel, lime, pumice.
Idaho	67,063	69,689	68,513	75,178	29	.43	Lead, zinc, silver, phosphate rock.
Illinois	462,443	473,077	533,464	572,321	7	3.30	Petroleum, coal, stone, sand and gravel.
Indiana	169,781	165,369	183,479	195,674	21	1.13	Coal, cement, petroleum, stone.
Iowa	51,994	58,798	63,555	66,529	32	.38	Cement, stone, sand and gravel, coal.
Kansas	413,231	449,587	470,830	493,307	10	2.85	Petroleum, natural gas, cement, stone.
Kentucky	381,742	327,503	391,068	443,168	12	2.56	Coal, petroleum, natural gas, stone.
Louisiana	965,237	998,057	1,156,637	1,281,849	3	7.39	Petroleum, natural gas, natutal-gas liquids, sulfur.
Maine	10,503	10,716	12,991	12,179	45	.07	Cement, sand and gravel, stone, slate.
Maryland	27,085	30,743	35,491	40,532	38	.23	Stone, sand and gravel, cement, coal.
Massachusetts	17,191	18,851	22,109	25,085	41	.14	Stone, sand and gravel, lime, clays.
Michigan	286,487	279,940	363,787	394,536	14	2.27	Iron ore, cement, copper, salt.
Minnesota	542,545	351,474	501,151	501,027	9	2.89	Iron ore, sand and gravel, stone, cement.
Mississippi	107,868	110,563	122,620	133,098	27	.77	Petroleum, natural gas, sand and gravel, cement.
Missouri	128,207	131,280	151,626	163,693	23	.94	Lead, cement, stone, lime.

See footnote at end of table.

TABLE 15.—Value of mineral production in the United States,[1] 1953–56, by States, in thousand dollars, and principal minerals produced in 1956—Con.

State	1953	1954	1955	1956			
				Value	Rank	Percent of U. S. total	Principal minerals in order of value
Montana	132,184	126,412	166,993	213,728	19	1.23	Copper, petroleum, zinc, sand and gravel.
Nebraska	33,281	42,393	54,237	71,776	30	.41	Petroleum, cement, sand and gravel, stone.
Nevada	73,523	89,138	113,220	126,233	28	.73	Copper, tungsten concentrate, manganese ore, sand and gravel.
New Hampshire	1,805	2,112	2,605	3,436	48	.02	Sand and gravel, stone, mica, feldspar.
New Jersey	51,945	47,044	57,495	64,279	34	.37	Stone, sand and gravel, iron ore, magnesium compounds.
New Mexico	336,545	373,519	436,494	513,303	8	2.96	Petroleum, potassium salts, copper, natural gas.
New York	186,868	192,738	216,907	237,016	18	1.37	Cement, iron ore, stone, sand and gravel.
North Carolina	38,451	41,651	41,210	39,985	39	.23	Stone, tungsten concentrate, sand and gravel, mica.
North Dakota	19,237	22,223	44,123	53,554	36	.31	Petroleum, coal, sand and gravel, natural-gas liquids.
Ohio	302,242	293,659	340,457	375,488	15	2.16	Coal, stone, cement, lime.
Oklahoma	679,003	650,205	711,089	757,116	6	4.37	Petroleum, natural gas, natural-gas liquids, stone.
Oregon	24,449	32,268	31,736	34,011	40	.20	Sand and gravel, cement, stone, nickel.
Pennsylvania	1,121,622	925,545	969,910	1,088,867	4	6.28	Coal, cement, stone, petroleum.
Rhode Island	1,462	1,461	1,834	1,627	49	.01	Sand and gravel, stone, graphite.
South Carolina	17,771	17,744	20,197	21,342	44	.12	Cement, clays, stone, sand and gravel.
South Dakota	33,823	37,874	40,526	41,797	37	.24	Gold, sand and gravel, stone, cement.
Tennessee	98,050	105,686	119,316	137,846	25	.79	Coal, cement, stone, zinc.
Texas	3,647,913	3,730,705	3,993,310	4,211,284	1	24.28	Petroleum, natural gas, natural-gas liquids, sulfur.
Utah	298,589	255,495	331,929	396,942	13	2.29	Copper, coal, iron ore, uranium.
Vermont	20,302	20,483	23,884	23,131	43	.13	Stone, slate, asbestos, copper.
Virginia	152,979	129,603	172,541	208,807	20	1.20	Coal, stone, cement, sand and gravel.
Washington	54,577	53,300	67,334	61,665	35	.36	Cement, sand and gravel, stone, zinc.
West Virginia	790,110	636,311	755,512	935,074	5	5.39	Coal, natural gas, natural-gas liquids, stone.
Wisconsin	55,212	54,286	65,813	65,860	33	.38	Stone, sand and gravel, iron ore, zinc.
Wyoming	255,906	281,306	297,752	316,897	17	1.83	Petroleum, clays, coal, sodium salts.
Total	14,418,000	14,066,000	15,804,000	17,346,000	------	100.00	Petroleum, coal, natural gas, cement.

[1] Includes Alaska and Hawaii.

TABLE 16.—Comparison of world and United States [1] production of principal mineral fuels, 1955–56

[Compiled under the supervision of Berenice B. Mitchell, Division of Foreign Activities, Bureau of Mines]

Mineral	1955			1956		
	World	United States		World	United States	
	Thousand short tons		Percent of world	Thousand short tons		Percent of world
Coal:						
Bituminous	1,615,480	461,468	29	1,701,720	497,996	29
Lignite	592,720	3,166	(2)	624,680	2,878	(2)
Pennsylvania anthracite	144,600	26,205	18	155,700	28,900	19
Coke (excluding breeze):						
Gashouse [3]	49,500	(4)	(4)	50,800	182	(2)
Oven and beehive	265,900	75,302	28	279,400	74,454	27
Fuel briquets and packaged fuel	114,600	1,699	1	118,400	1,584	1
Natural gas ... million cubic feet	(5)	9,405,351	(5)	(5)	10,081,923	(5)
Peat	65,580	274	(2)	58,340	292	(2)
Petroleum (crude) ... thousand barrels	5,626,225	2,484,428	44	6,125,425	2,617,432	43

[1] Including Alaska and noncontiguous Territories.
[2] Less than 1 percent.
[3] Includes low- and medium-temperature and gashouse coke.
[4] Bureau of Mines not at liberty to publish United States figure separately.
[5] Data not available.

Employment and Injuries in the Fuel Industries

By John C. Machisak

INTRODUCTION

THIS CHAPTER of the Minerals Yearbook contains injury experience and related employment data for the coal-mining, coking, and oil and gas industries for 1956. Injury experience is measured by the number of injuries per million man-hours of exposure to the hazards of the particular industry.

Since the accident hazards for each of the three sections are not comparable, no attempt has been made to combine data for presenting an overall experience for the fuel section of the mineral industries. Discussions and tabulations covering the injury and employment records of the mineral industry as a whole are presented in volume III.

COAL

Injury experience in 1956, based on an incomplete return, was less favorable at the Nation's coal mines than in the preceding year. On the basis of material available at the present time, the combined (fatal and nonfatal) frequency rate of 47.88 injuries per million man-hours of exposure was 3 percent higher than in 1955.

The number of fatal injuries determined to be chargeable to the coal-mining industry was 445 or 7 percent more than in the previous year, and the resulting rate of occurrence (1.10) was 10 percent higher.

No major disasters (a single accident in which 5 or more men are killed) occurred during either year. The last such disaster was on November 13, 1954, when 16 men were killed as a result of an explosion in a West Virginia mine.

Injuries in underground workings resulted in 11 percent more deaths in 1956 than in 1955. Stripping operations reported 4 percent more deaths, while surface works showed a decided improvement in safety of operation—29 percent fewer fatalities than in 1955. The number of nonfatal injuries, or those involving loss of time beyond the day of injury, was 18,934—79 less than in 1955.

The average working force and their accumulated worktime decreased 7 and 3 percent, respectively. Each employee averaged a 7.85-hour shift for an aggregate of 1,696 hours during the year.

Bituminous-Coal Mines.—The safety record of the bituminous-coal-mining industry was not as favorable in 1956 as in 1955 due to an increase in the number of fatalities reported and a decrease in the total man-hours worked. The rate of 45.04 injuries (fatal and non-

TABLE 1.—Employment and injury experience at coal mines in the United States, 1952–56

Industry and year	Average men working daily [1]	Average active mine days [2]	Million man-days worked	Million man-hours worked	Number of injuries		Frequency rates per million man-hours	
					Fatal	Nonfatal	Fatal	Nonfatal
Bituminous-coal mines: [3]								
1952	338,719	186	63.0	497.9	449	23,719	0.90	47.64
1953	295,425	191	56.3	444.3	397	20,112	.89	45.26
1954	241,919	177	42.8	337.7	334	14,746	.99	43.66
1955 [4]	226,683	209	47.5	374.9	357	16,128	.95	43.02
1956 [5]	209,714	216	45.3	358.8	389	15,774	1.08	43.96
Anthracite mines:								
1952	62,610	207	13.0	95.8	99	6,355	1.03	66.35
1953	55,701	169	9.4	69.3	64	4,146	.92	59.85
1954	41,786	164	6.8	50.2	62	2,972	1.23	59.18
1955 [4]	31,320	185	5.8	42.6	60	2,885	1.41	67.76
1956 [5]	28,979	217	6.3	45.9	56	3,160	1.22	68.79
Total coal mines:								
1952	401,329	189	76.0	593.7	548	30,074	.92	50.66
1953	351,126	187	65.7	513.6	461	24,258	.90	47.23
1954	283,705	175	49.6	388.0	396	17,718	1.02	45.67
1955 [4]	258,003	207	53.3	417.5	417	19,013	1.00	45.54
1956 [5]	238,693	216	51.6	404.7	445	18,934	1.10	46.78

[1] Average number of men at work each day mine was active. Because absenteeism and labor turnover are taken into consideration, this number is lower than number of men available for work, as measured by a count of names on payroll.
[2] Average in which operating time of each mine is weighted by average number of workers in mines.
[3] Includes lignite.
[4] Revised preliminary data.
[5] Incomplete data—includes only company reports received in Washington office by June 15, 1957.

fatal) per million man-hours of exposure for the industry was 2 percent higher than the rate of 43.97 for 1955.

In 1956 the record shows that 389 men were killed at bituminous-coal mines, with a resulting frequency rate of 1.08 per million man-hours. This rate was 14 percent higher than the rate of 0.95 established in 1955, when 357 fatal injuries were reported. Of the 389 fatalities occurring in 1956, underground operations reported 340, surface works 24, and strip operations 25. The principal causes of underground injuries (roof falls and haulage) claimed 285 lives in 1956 compared with 254 in 1955—an increase of 12 percent.

Underground accidents resulting in fatal injuries in the remaining agencies such as explosions, explosives, electricity, machinery, mine fires, and "miscellaneous causes," taken as a group, showed an increase of 20 percent in 1956 over the previous year.

At surface operations a 27-percent decrease in the number of fatal injuries was recorded in 1956 from all agencies as a group, and at strip operations an increase of 4 percent was reported compared with the previous year.

The average number of men working daily at bituminous-coal mines in 1956 was 209,714, a 7-percent decline from the 1955 average employment of 226,683 men. The average number of days of employment per man increased from 209 in 1955 to 216 in 1956—an increase of 7 days of employment per man.

The total man-hours of worktime declined 4 percent in 1956. A workyear of 1,711 hours was reported in 1956 as compared with 1,654 in 1955—57 more hours of work per man than in 1955. The figures reported at this time from the bituminous industry are incomplete and will be revised when the canvass is completed.

Anthracite Mines.—The injury rate (fatal and nonfatal) per million man-hours at Pennsylvania anthracite mines increased 1 percent in 1956 owing entirely to a decrease in total man-hours worked. The combined rate of occurrence of injuries was 70.01 in 1956 and 69.17 in 1955. A total of 56 fatalities occurred at anthracite mines in 1956—a decrease of 4 from the preceding year.

The fatality rate per million man-hours in 1956 (1.22) was decreased 13 percent from that in 1955 (1.41). In all, 3,160 nonfatal lost-time injuries occurred at the rate of 68.79 per million man-hours—an increase of 275 in number and 2 percent in frequency compared with similar data for 1955.

Fatal accidents at anthracite mines in 1956 caused the death of 56 men—48 underground, 5 at surface operations, and 3 at strip mines. Falls of roof, face, or rib killed 31 men at underground mines, a decrease of 3 from the previous year. Six fatalities resulted from haulage injuries—the same number as in 1955. Explosions, explosives, electricity, and "miscellaneous causes" resulted in 11 fatalities, an increase of 2 over 1955 from agencies other than roof falls and haulage injuries underground. There was a decline of over one-third in the number of fatalities at surface operations, whereas the number of fatalities at strip mines was the same—three in each year.

The average number of men working daily at Pennsylvania anthracite mines in 1956 was 28,979, a 7-percent decline from the 1955 average employment of 31,320 men. The average number of days of employment per man increased from 185 in 1955 to 217 in 1956—an increase of 32 days of employment per man. In 1956 a workyear of 1,585 hours was recorded—226 more hours of work per man than in 1955.

The data from the Pennsylvania anthracite industry are incomplete and will be revised when the canvass is completed.

COKE

Coke operators reported 9 fatal and 302 disabling work injuries to the Bureau of Mines in 1956. Thus, the fatal injuries paralleled those in 1955, but the nonfatal injuries were fewer by 23. The combined fatal and nonfatal rates were 5.55 injuries per million man-hours worked and 3.92 per million tons of coke and breeze produced. The 26,143 ovens reported in existence January 1, 1956, operated at a reduced rate of capacity owing to dismantling of some ovens and rebuilding of others. The total production of coke, including breeze, decreased 1 percent; man-hours and man-days, 4 percent each; and men working, 2 percent.

Although coke plants operated 5 days less in 1956, the 7.99-hour shift of the 2 preceding years was maintained and the average employee accumulated 2,773 hours of worktime—39 less than in 1955.

Slot-Type Coke Ovens.—Injuries reported by oven-coke operators totaled 278 in 1956. Nine of these were fatalities—the same number as reported in 1955—while the 269 disabling work injuries were 11 less than in 1955. However, the nonfatal-frequency rate was 4.94 per million man-hours worked—as in 1955—because of a 4-percent decrease in man-hours, while the fatal rate increased 6 percent for the same reason.

TABLE 2.—Employment and injury experience at coke plants in the United States, 1952–56

Industry and year	Average men working daily [1]	Average active plant days [2]	Million man-days worked	Million man-hours worked	Number of injuries: Fatal	Number of injuries: Nonfatal	Frequency rates per million man-hours: Fatal	Frequency rates per million man-hours: Nonfatal
Slot-type coke ovens:								
1952	21,919	336	7.4	58.6	7	420	0.12	7.16
1953	21,011	362	7.6	61.1	8	332	.13	5.43
1954	17,944	361	6.5	51.8	8	245	.15	4.73
1955	19,597	362	7.1	56.7	9	280	.16	4.94
1956 [3]	19,129	355	6.8	54.4	9	269	.17	4.94
Beehive-coke ovens:								
1952	3,322	170	.6	4.2	1	126	.24	30.29
1953	2,429	201	.5	3.6	-------	93	-------	25.98
1954	1,265	71	.1	.7	-------	9	-------	13.40
1955	1,084	179	.2	1.5	-------	45	-------	30.96
1956 [3]	1,076	202	.2	1.6	-------	33	-------	20.37
All coke ovens:								
1952	25,241	315	7.9	62.8	8	546	.13	8.69
1953	23,440	345	8.1	64.7	8	425	.12	6.57
1954	19,209	342	6.6	52.5	8	254	.15	4.84
1955	20,681	352	7.3	58.2	9	325	.15	5.59
1956 [3]	20,205	347	7.0	56.0	9	302	.16	5.39

[1] Average number of men at work each day oven was active. Because absenteeism and labor turnover are taken into consideration, this number is lower than the number of men available for work, as measured by a count of names on payroll.
[2] Average in which operating time of each plant is weighted by average number of workers in the plant.
[3] Preliminary data.

Production decreased by 1.7 million tons, man-hours by 2.3 million, and man-days worked by 0.3 million in 1956. Coke ovens averaged 19,129 employees per day who worked an 8-hour shift, accumulating 2,845 hours of worktime each in 355 days—7 less than in 1955.

Beehive-Coke Ovens.—The beehive-coking industry operated its fourth consecutive year without a fatality. The nonfatal injuries reported for 1956 totaled 33 and resulted in a rate of 20.37 per million man-hours of exposure. When compared with data for 1955, a 27-percent decrease in number and 34-percent drop in frequency of occurrence was indicated.

Production increased 41 percent and man-hours and man-days worked 11 and 12 percent, respectively, in 1956.

The average number of employees was reduced by 8 to 1,076 men, who worked 202 days on a shift averaging 7.46 hours and accumulated 1,505 hours of worktime—a 12-percent increase over 1955.

OIL AND GAS

The injury experience of the oil and gas industry in 1956 was 8 percent better than in 1955, and the combined frequency rate (fatal and nonfatal) of 9.32 injuries per million man-hours was the lowest it has been in the 15-year period for which the Bureau of Mines has been collecting these data. The severity rate of 1.11 days lost for each 1,000 hours worked was slightly higher in 1956 because of a 5-percent decrease in man-hours from 1955. A total of 147 fatal and permanent total injuries was reported, as well as 522 permanent partial and 10,850 temporary disabilities. Compared with data for 1955, 7 of the 11 phases of the industry showed lower frequency rates—those recording higher rates than in the previous year were natural gasoline, pipeline oil, marine transportation (inland waters), and miscellaneous. The pipeline-gas segment of the industry attained the greatest improvement in frequency of occurrence of injuries (25 percent); however, severity of injuries increased slightly (2 percent). Drilling improved in both frequency and severity of injuries, as did refining—the only two departments having this distinction.

A total of 585,486 workers averaged 2,110 hours each in 1956, or 1 hour less than in 1955.

TABLE 3.—Employment and injury experience in the oil and gas industry of the United States, 1952–56

Year	Average men working daily	Million man-hours worked	Number of injuries		Frequency rates per million man-hours	
			Fatal [1]	Nonfatal	Fatal	Nonfatal
1952	586, 138	1, 228	150	15, 465	0. 12	12. 59
1953	594, 398	1, 264	179	14, 452	. 14	11. 43
1954	580, 783	1, 229	122	12, 796	. 10	10. 41
1955	617, 274	1, 303	135	13, 038	. 10	10. 01
1956	585, 486	1, 236	147	11, 372	. 12	9. 20

[1] Fatal and permanent total injuries combined.

CONCLUSION

Fatal injuries suffered by each phase of the fuels industry occurred at a higher rate per million man-hours of exposure in 1956 than in the previous year. However, because of a decrease of almost 2,000 in the number of nonfatal injuries in the coke and oil and gas industries, the overall safety record in these two segments showed improvement.

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PART II. COMMODITY REVIEWS

A. Coal and Related Products

Coal—Bituminous and Lignite

By W. H. Young, R. L. Anderson, and E. M. Hall

Contents

GENERAL SUMMARY

THE BITUMINOUS-COAL AND LIGNITE INDUSTRY generally improved sharply in 1956 compared with 1955. Production, average value, consumption, exports, sales of mechanical equipment, men working, days worked, and tons per man per day increased. The percentages mined by stripping and by auger were also greater in 1956 than in 1955. Only the percentages mechanically loaded and mechanically cleaned declined slightly.

Production.—The output of bituminous coal and lignite in 1956—500.9 million tons—was 8 percent greater than the 464.6 million tons produced in 1955. The higher production in 1956 was due largely to increased consumption in the United States as a result of a general increase in business activity and a sharp rise in exports.

Production fluctuated less in 1956 than it had for many years. The only major fluctuation resulted from the miners' vacation period of 10 days in midsummer. According to the Bureau of Labor Statistics, United States Department of Commerce, time lost on account of strikes amounted to 377,000 man-days in 1956, compared with 273,000 in 1955.

Trend of Employment.—Employment increased slightly, owing largely to increased production.

Index to Capacity.—As it is impossible for all mines to operate every working day in the year, a conservative figure of 280 days for calculating potential capacity was suggested some years ago by the coal committee of the American Institute of Mining and Metallurgical Engineers. (See Minerals Yearbook, 1935, pp. 631–632.) The average output per day worked in 1956 was 2.3 million tons, which, if applied to 280 days, gives an annual potential output of 655 million tons, compared with the actual production of 500.9 million tons.

Mechanization.—A slightly smaller proportion—84 percent—of coal was loaded mechanically at underground mines in the United States in 1956 than in the preceding year. Sales of continuous-mining machines increased in 1956. Production at auger mines increased 32 percent over 1955.

Mechanical Cleaning.—Approximately 58 percent of the bituminous coal and lignite mined in the United States in 1956 was mechanically cleaned. The general trend toward mechanical cleaning has closely paralleled the growth of mechanical mining, partly because in mechanical mining more refuse is loaded with the coal, and thus more mechanical cleaning is required. Moreover, the bituminous-coal and lignite industry has attempted to meet consumers' demands for cleaner coal. A large part of the remaining 42 percent was handpicked and screened into various sizes at tipples with no mechanical cleaning facilities.

TABLE 1.—Salient statistics of the bituminous-coal and lignite industry in the United States, 1955–56

	1955	1956	Change from 1955 (percent)
Production ... net tons	464, 633, 408	500, 874, 077	+7.8
Consumption in the United States ... do	423, 412, 000	432, 858, 000	+2.2
Stocks at end of year:			
Industrial consumers and retail yards ... do	68, 423, 000	78, 008, 000	+14.0
Stocks on upper Lake docks ... do	4, 138, 387	4, 881, 617	+18.0
Imports and exports: [1]			
Imports ... do	337, 145	355, 701	+5.5
Exports ... do	[2] 51, 277, 256	68, 546, 290	+33.7
Price indicators (average per net ton):			
Average cost of railroad fuel purchased, f. o. b. mines [3]	$4.65	$5.03	+8.2
Average cost of coking coal at merchant coke ovens	$9.16	$9.85	+7.5
Average retail price [4]	$15.10	$15.65	+3.6
Average railroad freight charge per net ton [3]	$3.24	$3.45	+6.5
Average value f. o. b. mines	[2] $4.50	$4.82	+7.1
Equipment sold:			
Mobile loading machines	120	239	+99.2
Continuous-mining machines	109	154	+41.3
Augers	65	89	+36.9
Shuttle cars	348	560	+60.9
Conveyors:			
"Mother"	78	137	+75.6
Room or transfer	143	232	+62.2
Method of mining:			
Hand-loaded underground ... net tons	52, 793, 925	58, 372, 495	+10.6
Mechanically loaded underground ... do	290, 671, 314	307, 401, 548	+5.8
Percentage of total underground production mechanically loaded	84.6	84.0	−.7
Mined by stripping ... net tons	115, 092, 769	127, 055, 382	+10.4
Mined at auger mines ... do	6, 075, 400	8, 044, 652	+32.4
Mechanically cleaned ... do	272, 715, 484	292, 365, 384	+7.2
Number of mines	7, 856	8, 520	+8.5
Average number of days worked [5]	210	214	+1.9
Average number of men working daily [5]	225, 093	228, 163	+1.4
Production per man per day [5] ... net tons	9.84	10.28	+4.5
Fuel-efficiency indicator: Pound of coal per kilowatt-hour at electric powerplants [6]	0.95	0.94	−1.1

[1] Bureau of the Census, U. S. Department of Commerce.
[2] Revised.
[3] Interstate Commerce Commission.
[4] Bureau of Labor Statistics, U. S. Department of Labor.
[5] Accident Analysis Branch, Federal Bureau of Mines.
[6] Federal Power Commission.

Consumption.—Consumption of bituminous coal and lignite in the United States increased 2 percent in 1956 over the preceding year. All classes of consumers except railroads, oven coke plants and steel and rolling mills used more coal in 1956 than in 1955. Deliveries to retail dealers declined.

Trends of Fuel Efficiency.—As for many years past, electric public-utility powerplants scored new records in fuel efficiency.

Competition With Oil and Gas.—Although consumption of energy has increased steadily since 1920, the proportion supplied by bituminous coal and lignite has decreased consistently, indicating serious competition from oil and gas. Of the total energy consumed in 1956, bituminous coal and lignite represented 27 percent; anthracite, 1; oil, 42; gas, 26; and waterpower, 4.

Electric-power utilities consumed 10 percent more bituminous coal and 7 percent more gas in 1956 than in 1955. Three percent less fuel oil was consumed in 1956 than in 1955.

Class I railroads decreased their consumption of coal 20 percent from 1955 to 1956, and increased their purchases of fuel oil and diesel fuel 7 percent.

Stocks.—The reserve supply of bituminous coal and lignite in the hands of industrial consumers and retail coalyards increased from 68.4 million tons at the beginning of 1956 to 78 million tons at the end of the year. Stocks increased from a 47- to a 62-day supply. Stocks on upper Lake docks increased 743,230 tons from January 1 to December 31, 1956.

SCOPE OF REPORT

These data include all coal produced in Alaska and the United States except Pennsylvania anthracite and Texas lignite. Alaska production is included in total production of the United States.

Throughout the chapter all tonnage figures represent net tons of marketable coal and exclude washery and other refuse. "Tons" refers to net short tons of 2,000 pounds.

Statistics for 1956 are final and are based upon detailed annual reports of production and mine operation furnished by producers. All but a small percentage of the output was covered by the reports submitted. For production not directly reported, chiefly that of small mines, it has been possible to obtain reasonably accurate data from the records of the various State mine departments, which have statutory authority to require such reports, or, in a few instances, from railroad carloadings. Thus, the report represents complete coverage of all mines having an output of 1,000 tons a year or more. The report does not attempt to include many small mines that produce less than 1,000 tons a year.

In 1955 and 1956 the annual production form did not request information on employment. The figures on men working daily, days worked, man-days worked, and tons per man per day were obtained from the Accident Analysis Branch of the Bureau of Mines.

Additional details on statistical procedures are given in the following sections; Production by Months and Weeks, Number and Size of Mines, Mechanical Cleaning, Production by States and Counties, Consumption, Relative Rate of Growth of Mineral Fuels and Waterpower, and Stocks.

RESERVES*

TABLE 2.—Coal reserves of the United States, Jan. 1, 1953, by States

(In million short tons)

State	Estimated original reserves					Reserves depleted to Jan. 1, 1953		Remaining reserves Jan. 1, 1953	Recoverable reserves Jan. 1, 1953, assuming 50-percent recovery
	Bituminous coal	Subbituminous coal	Lignite	Anthracite and semianthracite	Total	Production [1]	Production plus loss in mining, assuming past losses equal production		
Alabama [2]	67,570				67,570	861	1,722	65,848	32,924
Arkansas	1,396		90	230	1,716	94	188	1,528	764
COLORADO [3]	90,258	9,437		713	100,408	484	968	99,440	49,719
GEORGIA	100				100	12	24	76	38
ILLINOIS	[4] 137,321				[4] 137,321	[5] 156	[5] 312	137,009	68,504
INDIANA	37,293				37,293	1,039	2,078	35,215	17,607
Iowa	29,160				29,160	348	696	28,464	14,232
KANSAS	[4] 20,774		(6)		20,774	[5] 6	[5] 12	20,762	10,381
Kentucky	123,327				123,327	2,177	4,354	118,973	59,487
MARYLAND	[4] 1,200				[4] 1,200	[5] 2	[5] 4	1,196	598
MICHIGAN	297				297	[7] 46	[8] 77	220	110
Missouri	79,362				79,362	267	534	78,828	39,414
MONTANA	2,363	132,151	87,533		222,047	164	328	221,719	110,860
NEW MEXICO	10,948	50,801		6	61,755	123	246	61,509	30,754
NORTH CAROLINA	112				112	1	2	110	55
NORTH DAKOTA			350,910		350,910	77	154	350,756	175,378
Ohio	86,584				86,584	1,806	3,612	82,972	41,486
Oklahoma	54,951				54,951	166	332	54,619	27,309
PENNSYLVANIA	75,093			22,805	97,898	12,761	25,522	72,376	36,189
SOUTH DAKOTA			2,033		2,033	1	2	2,031	1,015
Tennessee	25,665				25,665	340	680	24,985	12,493
Texas	8,000		23,000		31,000	62	124	30,876	15,438
Utah	88,184	5,156			93,340	218	436	92,904	46,452
VIRGINIA	11,696			355	12,051	609	1,218	10,833	5,417
Washington	11,413	52,442		23	63,878	145	290	63,588	31,794
WEST VIRGINIA	116,618				116,618	5,428	10,856	105,762	52,881
WYOMING	13,235	[9] 108,319	(9)		121,554	383	766	120,788	60,395
Other States	[10] 820	[11] 15,500	[12] 50		16,370	9	18	16,352	8,176
Total	1,093,740	373,806	463,616	24,132	1,955,294	[13] 27,785	55,555	1,899,739	949,870

*Averitt, Paul, Berryhill, Louise R., and Taylor, Dorothy A., Coal Resources of the United States: Geol. Survey Circ. 293, 1954, p. 5.

[1] Production, 1800–85, from Eavenson, H. N., The First Century and a Quarter of American Coal Industry, Pittsburgh, 1942, pp. 432–434; production, 1886–1952, from Geol. Survey Mineral Resources volumes and Bureau of Mines Minerals Yearbooks unless otherwise indicated.

[2] Reserve estimates of States in lower case letters were prepared by, or under the direction of, M. R. Campbell before 1928.

[3] Reserve estimates of States in capital letters supersede earlier estimates by M. R. Campbell. [4] Remaining reserves, January 1, 1950.

[5] Production, 1950–52. [6] See discussion in text.

[7] Production, 1860–1949, Michigan Geological Survey Division, as cited in Cohee, G. V., Burns, R. N., Brown, Andrew, Brant, R. A., and Wright, Dorothy, Coal Resources of Michigan: Geol. Survey Circ. 77, 1950, p. 56.

[8] Past losses assumed to be 40 percent of coal originally in the ground.

[9] Small reserves and production of lignite included under subbituminou coal.

[10] Includes Arizona, California, Idaho, and Oregon.

[11] Includes Arizona, California, and Oregon.

[12] Includes California and Louisiana.

[13] Somewhat less than total recorded production. See footnote 5.

THICKNESS OF BITUMINOUS-COAL AND LIGNITE SEAMS

The Bureau of Mines has compiled and published detailed data on thickness of seams for coal mines in 1955.[2] Because of the importance of seam thickness in mining operations, the data for 1955 follow.

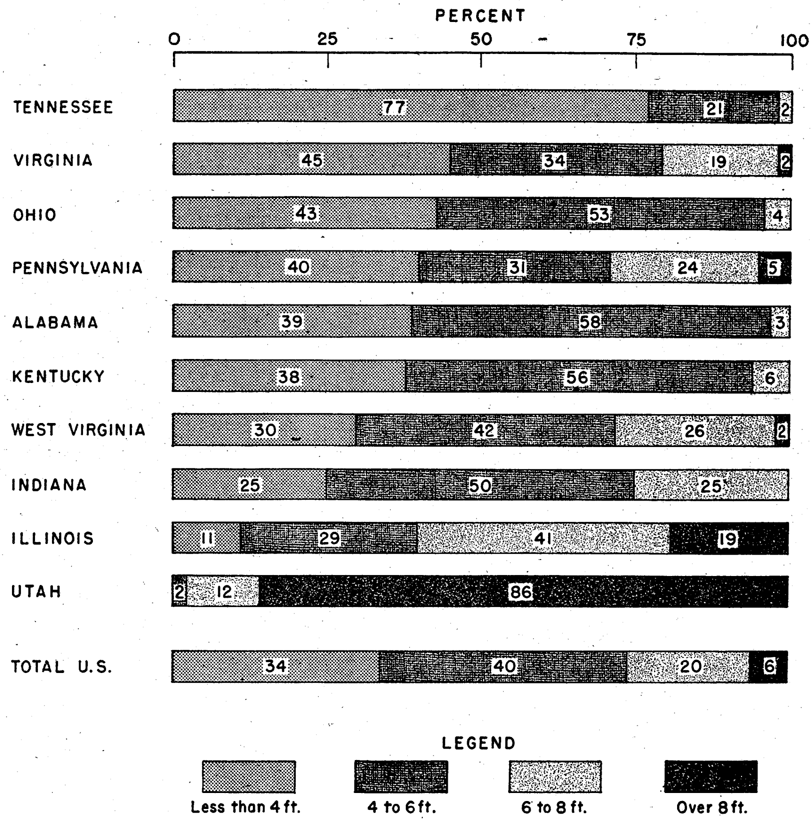

FIGURE 1.—Percentage of bituminous coal and lignite produced in the 10 largest coal-producing States and total United States, 1955, by thickness of seams mined.

[2] Young, W. H., and Anderson, R. L., Thickness of Bituminous-Coal and Lignite Seams at All Mines, and Thickness of Overburden at Strip Mines in the United States in 1955: Bureau of Mines Inf. Circ. 7812, 1957, 11 pp.

TABLE 3.—Number and production of bituminous-coal and lignite mines in the United States, 1955, classified by thickness of seams mined

Item	Less than 2 feet	2 to 3 feet	3 to 4 feet	4 to 5 feet	5 to 6 feet	6 to 7 feet	7 to 8 feet	8 feet and over	Total
Number of mines:									
Underground	32	1,289	2,467	1,243	438	251	152	163	6,035
Strip	117	484	503	267	113	47	23	63	1,617
Auger		35	78	67	14	7		3	204
Total	149	1,808	3,048	1,577	565	305	175	229	7,856
Percentage of mines:									
Underground	.5	21.4	40.9	20.6	7.2	4.2	2.5	2.7	100.0
Strip	7.2	30.0	31.1	16.5	7.0	2.9	1.4	3.9	100.0
Auger		17.2	38.2	32.8	6.9	3.4		1.5	100.0
Total	1.9	23.0	38.8	20.1	7.2	3.9	2.2	2.9	100.0
Production (thousand tons):									
Underground	269	17,610	81,934	69,650	65,621	50,397	35,107	22,877	343,465
Strip	4,232	19,303	31,516	29,016	17,579	5,923	1,077	6,447	115,093
Auger		423	1,627	2,774	661	525		65	6,075
Total	4,501	37,336	115,077	101,440	83,861	56,845	36,184	29,389	464,633
Percentage of production:									
Underground	.1	5.1	23.9	20.2	19.1	14.7	10.2	6.7	100.0
Strip	3.7	16.8	27.4	25.2	15.2	5.2	.9	5.6	100.0
Auger		7.0	26.8	45.7	10.9	8.6		1.0	100.0
Total	1.0	8.0	24.8	21.8	18.1	12.2	7.8	6.3	100.0

TABLE 4.—Number of mines, production, output per man per day, and average thickness of seams mined, at underground, strip, and auger bituminous-coal and lignite mines in the United States, by States, in 1955

State	Underground mines				Strip mines				Auger mines				Total, all mines			
	Number of mines	Production (net tons)	Average output per man per day (tons)	Average thickness of seams mined (feet)	Number of mines	Production (net tons)	Average output per man per day (tons)	Average thickness of seams mined (feet)	Number of mines	Production (net tons)	Average output per man per day (tons)	Average thickness of seams mined (feet)	Number of mines	Production (net tons)	Average output per man per day (tons)	Average thickness of seams mined (feet)
Alabama	195	10,970,610	6.25	4.4	39	2,110,979	14.64	3.2	1	6,888	20.00	8.0	235	13,088,477	6.89	4.6
Alaska	6	239,571	5.64	20.7	7	400,125	16.94	23.7					13	639,696	9.68	22.6
Arizona	2	8,898	2.78	5.5									2	8,898	2.78	5.5
Arkansas	19	317,001	4.36	2.6	8	260,725	11.65	1.7					27	577,726	6.08	2.2
California (lignite)					1	7,650	15.30	8.0					1	7,650	15.30	8.0
Colorado	110	3,211,125	5.84	7.1	7	356,805	24.41	6.2					117	3,567,930	6.32	7.0
Georgia	6	12,471	2.70	1.5									6	12,471	2.70	1.5
Illinois	103	27,256,495	14.23	7.3	68	18,675,619	23.87	4.8					171	45,932,114	17.02	6.3
Indiana	44	4,967,089	10.66	6.2	56	11,182,221	27.14	4.4					100	16,149,310	18.39	5.0
Iowa	30	297,490	4.33	4.5	30	960,867	16.35	3.9					60	1,258,357	9.87	4.1
Kansas	5	14,819	3.17	2.7	19	727,463	11.97	1.6					24	742,282	11.34	1.6
Kentucky	1,852	54,440,144	8.38	4.4	118	13,643,240	25.36	4.8	34	936,526	19.17	4.4	2,004	69,019,910	9.75	4.4
Maryland	58	275,454	3.82	3.8	26	237,015	12.22	4.7					84	512,469	5.60	4.2
Missouri	19	157,103	2.99	3.6	28	3,075,382	20.69	2.5					47	3,232,485	16.06	2.6
Montana (bituminous and lignite)	19	439,285	7.95	5.8	5	807,968	67.25	23.5					24	1,247,253	18.54	17.3
New Mexico	28	174,299	3.86	5.8	3	27,280	14.44	6.3					31	201,579	4.28	5.9
North Dakota (lignite)	5	21,357	7.99	10.1	40	3,080,730	35.90	12.1					45	3,102,087	35.06	12.1
Ohio	233	12,632,165	8.47	4.8	259	23,958,329	22.83	3.8	38	1,279,297	35.38	4.1	530	37,869,791	14.70	4.2
Oklahoma	14	694,323	4.57	3.7	21	1,469,213	17.75	2.3					35	2,163,536	9.22	2.8
Pennsylvania	797	64,904,231	7.19	5.5	585	20,518,113	14.99	3.2	29	291,112	13.50	3.0	1,411	85,713,456	8.23	4.9
South Dakota (lignite)					2	25,782	10.31	4.5					2	25,782	10.31	4.5
Tennessee	409	5,340,664	5.72	3.9	87	1,635,052	16.72	2.5	8	77,128	11.62	3.3	504	7,052,844	6.79	3.6
Utah	50	6,295,524	9.75	11.1									50	6,295,524	9.75	11.1
Virginia	1,007	22,241,262	7.19	4.5	31	981,782	13.78	5.0	21	284,465	14.06	4.5	1,059	23,507,509	7.38	4.5
Washington	12	578,076	5.01	7.6	1	31,714	25.66	5.5					13	609,790	5.24	7.5
West Virginia	996	126,588,262	8.86	5.1	168	9,379,643	22.96	5.8	73	3,199,984	22.92	4.7	1,237	139,167,889	9.38	5.1
Wyoming	16	1,387,521	9.35	8.0	8	1,539,072	36.32	33.1					24	2,926,593	15.34	21.2
Total	6,035	343,465,239	8.28	5.3	1,617	115,092,769	21.12	4.9	204	6,075,400	22.22	4.4	7,856	464,633,408	9.84	5.2

DOMESTIC PRODUCTION

TABLE 5.—Growth of the bituminous-coal and lignite-mining industry in the United States, 1890–1956

Year	Production (net tons)	Value of production		Number of mines	Capacity at 280 days (million tons)	Foreign trade [1]	
		Total	Average per ton			Exports (net tons)	Imports (net tons)
1890	111,302,322	$110,420,801	$0.99	(2)	137	1,272,396	1,047,416
1891	117,901,238	117,188,400	.99	(2)	148	1,651,694	1,181,677
1892	126,856,567	125,124,381	.99	(2)	162	1,904,556	1,491,800
1893	128,385,231	122,751,618	.96	(2)	174	1,986,383	1,234,499
1894	118,820,405	107,653,501	.91	(2)	196	2,439,720	1,286,268
1895	135,118,193	115,779,771	.86	2,555	196	2,659,987	1,411,323
1896	137,640,276	114,891,515	.83	2,599	202	2,515,838	1,393,095
1897	147,617,519	119,595,224	.81	2,454	213	2,670,157	1,442,534
1898	166,593,623	132,608,713	.80	2,862	221	3,004,304	1,426,108
1899	193,323,187	167,952,104	.87	3,245	230	3,897,994	1,409,838
1900	212,316,112	220,930,313	1.04	(2)	255	6,060,688	1,911,925
1901	225,828,149	236,422,049	1.05	(2)	281	6,455,085	2,214,507
1902	260,216,844	290,858,483	1.12	(2)	316	6,048,777	2,174,393
1903	282,749,348	351,687,933	1.24	(2)	350	5,835,561	4,043,519
1904	278,659,689	305,397,001	1.10	4,650	386	7,206,879	2,179,882
1905	315,062,785	334,658,294	1.06	5,060	417	7,512,723	1,704,810
1906	342,874,867	381,162,115	1.11	4,430	451	8,014,263	2,039,169
1907	394,759,112	451,214,842	1.14	4,550	473	9,869,812	1,892,653
1908	332,573,944	374,135,268	1.12	4,730	482	11,071,152	2,219,243
1909	379,744,257	405,486,777	1.07	5,775	510	10,101,131	1,375,201
1910	417,111,142	469,281,719	1.12	5,818	538	11,663,052	1,819,766
1911	405,907,059	451,375,819	1.11	5,887	538	13,259,791	1,972,555
1912	450,104,982	517,983,445	1.15	5,747	566	16,475,029	1,456,333
1913	478,435,297	565,234,952	1.18	5,776	577	18,013,073	1,767,656
1914	422,703,970	493,309,244	1.17	5,592	608	17,589,562	1,520,962
1915	442,624,426	502,037,688	1.13	5,502	610	18,776,640	1,703,785
1916	502,519,682	665,116,077	1.32	5,726	613	21,254,627	1,713,837
1917	551,790,563	1,249,272,837	2.26	6,939	636	23,839,558	1,448,453
1918	579,385,820	1,491,809,940	2.58	8,319	650	22,350,730	1,457,073
1919	465,860,058	1,160,616,013	2.49	8,994	669	20,113,536	1,011,550
1920	568,666,683	2,129,933,000	3.75	8,921	725	38,517,084	1,244,990
1921	415,921,950	1,199,983,600	2.89	8,038	781	23,131,166	1,257,589
1922	422,268,099	1,274,820,000	3.02	9,299	832	12,413,085	5,059,999
1923	564,564,662	1,514,621,000	2.68	9,331	885	21,453,579	1,882,306
1924	483,686,538	1,062,626,000	2.20	7,586	792	17,100,347	417,226
1925	520,052,741	1,060,402,000	2.04	7,144	748	17,461,560	601,737
1926	573,366,985	1,183,412,000	2.06	7,177	747	35,271,937	485,666
1927	517,763,352	1,029,657,000	1.99	7,011	759	18,011,744	549,843
1928	500,744,970	933,774,000	1.86	6,450	691	16,164,485	546,526
1929	534,988,593	952,781,000	1.78	6,057	679	17,429,298	495,219
1930	467,526,299	795,483,000	1.70	5,891	700	15,877,407	240,886
1931	382,089,396	588,895,000	1.54	5,642	669	12,126,299	206,303
1932	309,709,872	406,677,000	1.31	5,427	594	8,814,047	186,909
1933	333,630,533	445,788,000	1.34	5,555	559	9,036,947	197,429
1934	359,368,022	628,383,000	1.75	6,258	565	10,868,552	179,661
1935	372,373,122	658,063,000	1.77	6,315	582	9,742,430	201,871
1936	439,087,903	770,955,000	1.76	6,875	618	10,654,959	271,798
1937	445,531,449	864,042,000	1.94	6,548	646	13,144,678	257,996
1938	348,544,764	678,653,000	1.95	5,777	602	10,490,269	241,305
1939	394,855,325	728,348,366	1.84	5,820	621	11,590,478	355,115
1940	460,771,500	879,327,227	1.91	6,324	639	16,465,928	371,571
1941	514,149,245	1,125,362,836	2.19	6,822	666	20,740,471	390,049
1942	582,692,937	1,373,990,608	2.36	6,972	663	22,943,305	498,103
1943	590,177,069	1,584,644,477	2.69	6,620	626	25,836,208	757,634
1944	619,576,240	1,810,900,542	2.92	6,928	624	26,032,348	633,689
1945	577,617,327	1,768,204,320	3.06	7,033	620	27,956,192	467,473
1946	533,922,068	1,835,539,476	3.44	7,333	699	41,197,378	434,680
1947	630,623,722	2,622,634,946	4.16	8,700	755	68,666,963	290,141
1948	599,518,229	2,993,267,021	4.99	9,079	774	45,930,133	291,337
1949	437,868,036	2,136,870,571	4.88	8,559	781	27,842,056	314,980
1950	516,311,053	2,500,373,779	4.84	9,429	790	25,468,403	346,706
1951	533,664,732	2,626,030,137	4.92	8,009	736	56,721,547	292,378
1952	466,840,782	2,289,180,401	4.90	7,275	703	47,643,150	262,268
1953	457,290,449	2,247,828,694	4.92	6,671	670	33,760,263	226,900
1954	391,706,300	1,769,619,723	4.52	6,130	603	31,040,564	198,799
1955	464,633,408	2,092,382,737	4.50	7,856	620	51,277,256	337,145
1956	500,874,077	2,412,004,151	4.82	8,520	655	68,546,290	355,701

1 Figures for 1890–1914 represent fiscal year ended June 30.
2 Data not available.

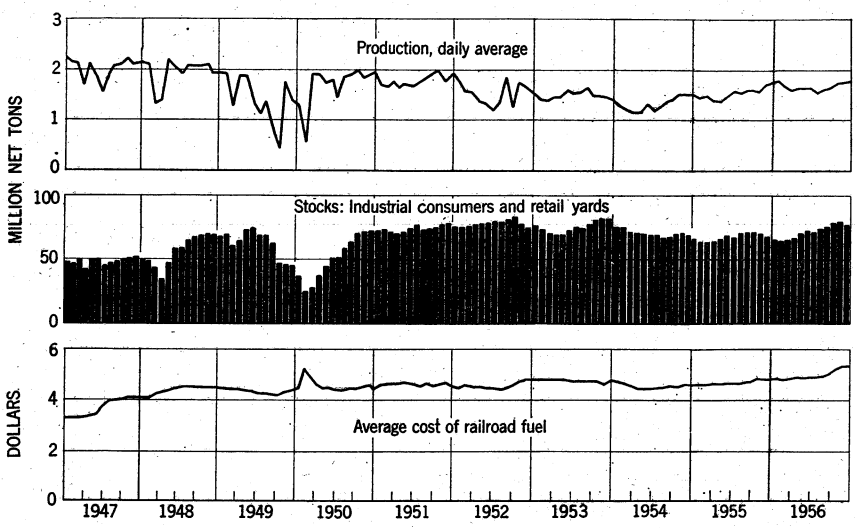

FIGURE 2.—Trends of production, stocks, and railroad-fuel prices of bituminous coal and lignite in the United States, 1947–56.

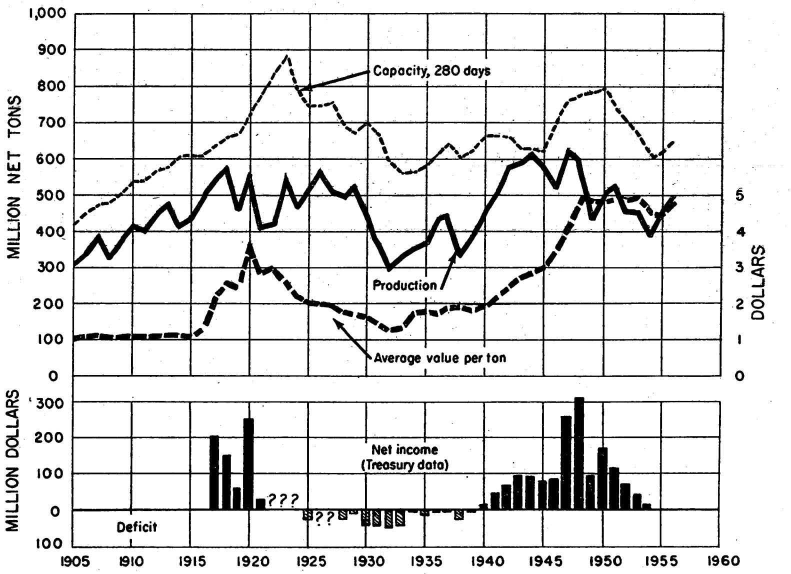

FIGURE 3.—Trends of bituminous-coal and lignite production, realization, mine capacity, and net income or deficit in the United States, 1905–56.

PRODUCTION BY MONTHS AND WEEKS

The figures on monthly and weekly production are estimates based upon (1) railroad carloadings of coal reported daily and weekly by all important carriers, (2) shipments on the Allegheny and Monongahela Rivers reported by the United States Army Engineers, (3) direct reports from mining companies, and (4) monthly production statements compiled by certain local operators' associations and State mine departments. In computing the estimates, allowance is made for commercial truck shipments, local sales, colliery fuel, and small truck mines producing over 1,000 tons a year. Preliminary estimates are made currently and published in the Weekly Coal

FIGURE 4.—Production of bituminous coal and lignite in the United States, 1955–56, by weeks.

Reports. These preliminary estimates have proved very reliable and for many years have been within approximately 1 percent of the final figure of total production, based upon complete coverage of all mines producing over 1,000 tons a year. The preliminary estimates are revised later to agree with the final total production based on the canvass. Thus, the monthly and weekly estimates of production, summarized in tables 6–9, represent final figures and vary slightly from the preliminary figures of production published in the Weekly Coal Reports.

TABLE 6.—Production of bituminous coal and lignite in the United States, 1955–56, with estimates by months

Month	Production (thousand net tons)		Maximum number of working days		Average production per working day (thousand net tons)	
	1955	1956	1955	1956	1955	1956
January	36, 255	45, 215	25	25	1, 450	1, 809
February	35, 248	42, 334	24	25	1, 469	1, 693
March	36, 857	43, 331	27	27	1, 365	1, 605
April	34, 220	40, 183	25. 4	24. 2	1, 347	1, 660
May	37, 898	43, 968	25. 5	26. 5	1, 486	1, 659
June	35, 576	39, 283	22. 6	23. 5	1, 574	1, 672
July	36, 078	30, 642	23. 3	19. 9	1, 548	1. 540
August	42, 484	43, 986	27	27	1, 573	1, 629
September	40, 324	40, 246	25	24	1, 613	1, 677
October	41, 332	47, 909	26	27	1, 590	1, 774
November	43, 135	44, 282	24. 9	24. 8	1, 732	1, 786
December	45, 226	39, 495	25. 6	22	1, 767	1, 795
Total	464, 633	500, 874	301. 3	295. 9	1, 542	1, 693

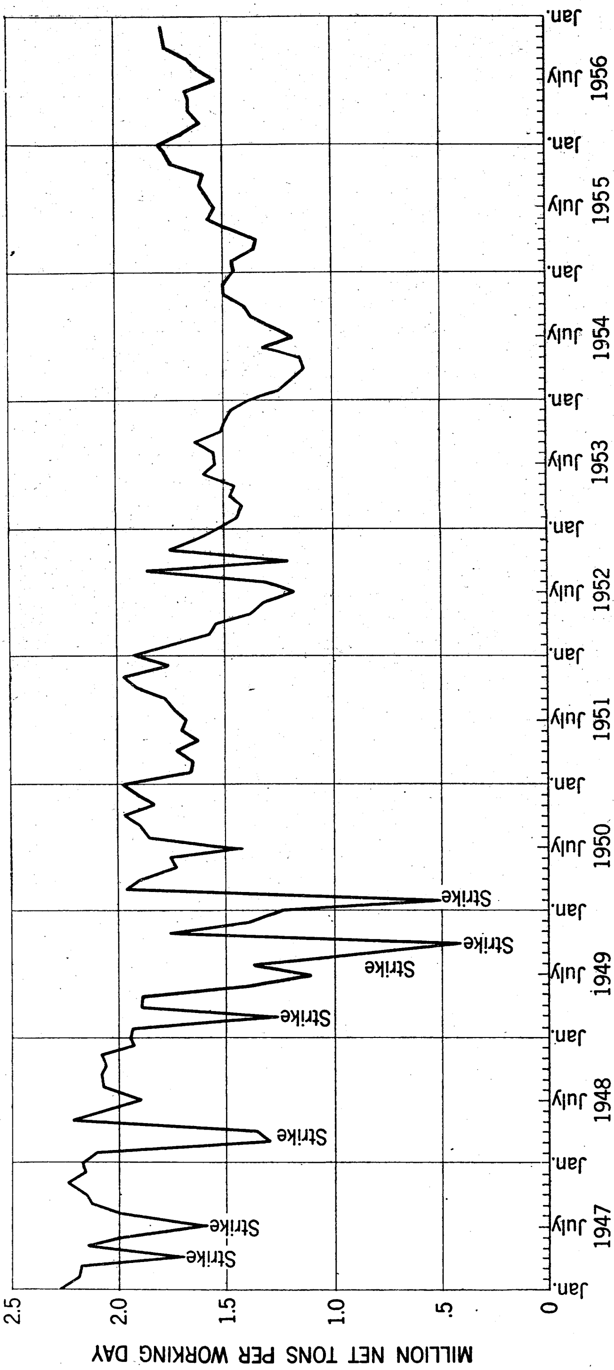

FIGURE 5.—Average production of bituminous coal and lignite in the United States per working day in each month, 1947–56.

TABLE 7.—Production of bituminous coal and lignite in the United States in 1956, by States, with estimates by months, in thousand net tons

[Totals for year are based on final complete returns from all operators known to have produced 1,000 tons or more per year. In most instances monthly apportionment is based on current records of railroad carloadings and shipments on the Allegheny and Monongahela Rivers, supplemented by direct reports from local sources]

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
Alabama	1,216	1,135	1,193	1,049	924	915	627	1,159	1,086	1,343	1,081	935	12,663
Alaska	69	60	65	52	51	34	52	53	61	69	76	85	727
Arkansas	58	51	53	45	51	46	29	45	54	58	50	50	590
Colorado	379	414	328	235	209	179	52	194	256	371	455	430	3,502
Illinois	4,930	4,636	4,250	3,678	3,790	3,452	2,965	3,786	3,706	4,525	4,253	4,131	48,102
Indiana	1,762	1,620	1,589	1,322	1,312	1,239	1,044	1,439	1,203	1,551	1,537	1,471	17,089
Iowa	169	166	124	88	90	91	82	86	86	118	124	134	1,358
Kansas	95	92	73	60	65	54	47	72	73	86	88	79	884
Kentucky:													
Eastern	4,140	3,679	3,437	3,311	4,058	3,693	2,851	4,189	3,758	4,503	3,916	3,456	44,991
Western	2,684	2,384	2,581	2,429	2,546	2,328	2,144	2,706	2,292	2,593	2,609	2,268	29,564
Total Kentucky	6,824	6,063	6,018	5,740	6,604	6,021	4,995	6,895	6,050	7,096	6,525	5,724	74,555
Maryland	58	57	60	47	40	45	45	39	46	75	87	70	669
Missouri	349	308	280	238	235	248	197	267	246	293	314	308	3,283
Montana:													
Bituminous	94	88	71	55	54	45	59	59	79	84	59	73	820
Lignite	3	3	3	1	1	1	2	1	2	3	3	3	26
Total Montana	97	91	74	56	55	46	61	60	81	87	62	76	846
New Mexico	22	21	20	14	9	8	6	11	12	12	11	13	159
North Dakota (lignite)	308	258	230	181	148	141	132	176	216	339	367	319	2,815
Ohio	3,292	2,835	3,264	3,298	3,539	3,441	2,812	3,453	3,181	3,815	3,364	2,640	38,934
Oklahoma	193	189	180	155	154	147	114	181	160	166	188	180	2,007
Pennsylvania	8,178	7,834	8,321	7,755	8,354	7,533	4,154	7,217	7,261	8,591	7,931	7,158	90,287
South Dakota (lignite)	2	2	2	2	2	2	2	2	2	2	3	2	25
Tennessee	730	615	747	669	778	713	664	874	778	884	780	616	8,848
Utah	671	627	614	403	505	424	243	612	556	616	626	625	6,522
Virginia	2,292	2,191	2,247	2,163	2,482	2,294	2,096	2,739	2,303	2,737	2,342	2,177	28,063
Washington	55	54	53	32	35	26	19	36	34	45	48	36	473
West Virginia:													
Southern [1]	8,883	8,525	8,925	8,644	10,107	8,706	6,650	10,143	8,706	10,462	9,341	8,099	107,191
Northern [2]	4,339	4,236	4,437	4,130	4,327	3,386	3,473	4,201	3,839	4,259	4,260	3,812	48,699
Total West Virginia	13,222	12,761	13,362	12,774	14,434	12,092	10,123	14,344	12,545	14,721	13,601	11,911	155,890
Wyoming	239	251	181	125	101	90	80	244	249	306	366	321	2,553
Other States [3]	5	3	3	2	1	2	1	2	1	3	3	4	30
Total	45,215	42,334	43,331	40,183	43,968	39,283	30,642	43,986	40,246	47,909	44,282	39,495	500,874

[1] Includes operations on the C. & O., N. & W., T. & O. C., Virginian, and the B. & O. in Clay, Greenbrier, Kanawha, Mason, Nicholas, and Pocahontas Counties.

[2] Rest of State, including the Panhandle district and Grant, Mineral, and Tucker Counties.

[3] Includes Arizona, California, and Georgia.

TABLE 8.—Production of bituminous coal and lignite in the United States in 1956, by districts, with estimates by months, in thousand net tons

[Districts as defined in the Bituminous Coal Act of Apr. 26, 1937 (50 Stats. 72, 91-94), and modifications thereto]

[Totals for year are based on final complete returns from all operators known to have produced 1,000 tons or more per year. In most instances monthly apportionment is based on current records of railroad carloadings and shipments on the Allegheny and Monongahela Rivers, supplemented by direct reports from local sources]

District	January	February	March	April	May	June	July	August	September	October	November	December	Total
1. Eastern Pennsylvania	3,621	3,598	3,514	3,275	3,521	3,359	2,601	3,309	3,192	3,775	3,627	3,366	40,758
2. Western Pennsylvania	4,645	4,323	4,897	4,554	4,903	4,242	1,621	3,977	4,140	4,921	4,421	3,889	50,533
3. Northern West Virginia	4,047	3,951	4,138	3,853	4,036	3,159	3,240	3,918	3,582	3,973	3,973	3,554	45,424
4. Ohio	3,292	2,835	3,264	3,298	3,539	3,441	2,812	3,453	3,181	3,815	3,364	2,640	38,934
5. Michigan													
6. Panhandle	262	255	269	250	261	204	210	253	232	256	257	231	2,940
7. Southern Numbered 1	4,196	4,085	4,245	4,122	4,800	4,124	3,196	4,838	4,128	4,972	4,424	3,817	50,947
8. Southern Numbered 2	11,556	10,678	10,811	10,397	12,313	10,996	8,798	12,756	11,105	13,259	11,641	10,284	134,594
9. West Kentucky	2,684	2,384	2,581	2,429	2,546	2,328	2,144	2,706	2,292	2,593	2,609	2,268	29,564
10. Illinois	4,930	4,636	4,250	3,678	3,790	3,452	2,965	3,786	3,706	4,525	4,253	4,131	48,102
11. Indiana	1,762	1,620	1,589	1,322	1,312	1,239	1,044	1,439	1,203	1,551	1,537	1,471	17,089
12. Iowa	169	166	124	88	90	91	82	86	86	118	124	134	1,358
13. Southeastern	1,511	1,383	1,494	1,317	1,236	1,201	894	1,510	1,398	1,699	1,396	1,184	16,223
14. Arkansas-Oklahoma	151	142	140	119	124	117	84	132	131	137	141	137	1,555
15. Southwestern	544	498	446	379	381	378	303	433	402	466	499	480	5,209
16. Northern Colorado	86	114	71	34	17	15	10	12	27	60	127	125	698
17. Southern Colorado	303	310	266	207	197	168	45	187	234	316	333	311	2,877
18. New Mexico	15	13	13	10	5	6	4	8	8	9	8	9	108
19. Wyoming	239	251	181	125	101	90	80	244	249	306	366	321	2,553
20. Utah	671	627	614	403	505	424	243	612	556	616	626	625	6,522
21. North-South Dakota	310	260	232	183	150	143	134	178	218	341	370	321	2,840
22. Montana	97	91	74	56	55	46	61	60	81	87	62	76	846
23. Washington	124	114	118	84	86	60	71	89	95	114	124	121	1,200
Total	45,215	42,334	43,331	40,183	43,968	39,283	30,642	43,986	40,246	47,909	44,282	39,495	500,874

TABLE 9.—Production of bituminous coal and lignite in the United States, 1955–56, with estimates by weeks

1955				1956			
Week ended—	Production (thousand net tons)	Maximum number of working days	Average production per working day (thousand net tons)	Week ended—	Production (thousand net tons)	Maximum number of working days	Average production per working day (thousand net tons)
Jan. 1	[1] 26	(1)	[2] 1,486	Jan. 7	9,385	5	1,877
Jan. 8	8,547	6	1,425	Jan. 14	10,759	6	1,793
Jan. 15	8,720	6	1,453	Jan. 21	10,652	6	1,775
Jan. 22	8,583	6	1,431	Jan. 28	10,528	6	1,755
Jan. 29	8,871	6	1,479	Feb. 4	9,852	6	1,642
Feb. 5	8,733	6	1,456	Feb. 11	10,276	6	1,713
Feb. 12	8,733	6	1,456	Feb. 18	10,173	6	1,696
Feb. 19	8,977	6	1,496	Feb. 25	10,098	6	1,683
Feb. 26	8,829	6	1,472	Mar. 3	9,979	6	1,663
Mar. 5	7,733	6	1,289	May 10	9,578	6	1,596
Mar. 12	8,315	6	1,386	Mar. 17	9,289	6	1,548
Mar. 19	7,986	6	1,331	Mar. 24	9,985	6	1,664
Mar. 26	7,843	6	1,307	Mar. 31	10,326	6	1,721
Apr. 2	7,294	5.4	1,351	Apr. 7	8,518	5.2	1,638
Apr. 9	8,126	6	1,354	Apr. 14	9,955	6	1,659
Apr. 16	8,330	6	1,388	Apr. 21	9,803	6	1,634
Apr. 23	8,459	6	1,410	Apr. 28	10,058	6	1,676
Apr. 30	8,475	6	1,413	May 5	9,845	6	1,641
May 7	8,467	6	1,411	May 12	9,873	6	1,646
May 14	8,642	6	1,440	May 19	9,667	6	1,611
May 21	9,031	6	1,505	May 26	9,961	6	1,660
May 28	9,132	6	1,522	June 2	8,557	5.5	1,556
June 4	8,552	5.5	1,555	June 9	9,707	6	1,618
June 11	9,080	6	1,513	June 16	10,132	6	1,689
June 18	9,367	6	1,561	June 23	10,150	6	1,692
June 25	9,425	5.6	1,683	June 30	7,208	3.5	2,059
July 2	2,217	1.3	1,705	July 7	1,324	.7	1,891
July 9	7,281	5	1,456	July 14	7,337	5.2	1,411
July 16	9,566	6	1,594	July 21	9,082	6	1,514
July 23	9,314	6	1,552	July 28	9,129	6	1,522
July 30	9,478	6	1,580	Aug. 4	9,222	6	1,537
Aug. 6	8,978	6	1,496	Aug. 11	9,395	6	1,566
Aug. 13	9,114	6	1,519	Aug. 18	9,779	6	1,630
Aug. 20	9,259	6	1,543	Aug. 25	9,850	6	1,642
Aug. 27	9,516	6	1,586	Sept. 1	9,891	6	1,649
Sept. 3	9,322	6	1,554	Sept. 8	8,712	5	1,742
Sept. 10	8,425	5	1,685	Sept. 15	10,613	6	1,769
Spet. 17	9,800	6	1,633	Sept. 22	10,061	6	1,677
Sept. 24	9,398	6	1,566	Sept. 29	10,479	6	1,747
Oct. 1	9,457	6	1,576	Oct. 6	10,409	6	1,735
Oct. 8	9,724	6	1,621	Oct. 13	10,232	6	1,705
Oct. 15	9,694	6	1,616	Oct. 20	10,540	6	1,757
Oct. 22	9,657	6	1,610	Oct. 27	10,442	6	1,740
Oct. 29	9,869	6	1,645	Nov. 3	10,560	6	1,760
Nov. 5	10,084	6	1,681	Nov. 10	10,218	6	1,703
Nov. 12	9,764	5.9	1,655	Nov. 17	10,338	5.8	1,782
Nov. 19	10,366	6	1,728	Nov. 24	9,088	5	1,818
Nov. 26	8,965	5	1,793	Dec. 1	10,888	6	1,815
Dec. 3	10,319	6	1,720	Dec. 8	10,794	6	1,799
Dec. 10	10,809	6	1,802	Dec. 15	10,860	6	1,810
Dec. 17	10,560	6	1,760	Dec. 22	11,360	6	1,893
Dec. 24	10,323	5.6	1,843	Dec. 29	5,183	3	1,728
Dec. 31	9,098	5	1,820	Jan. 5	[1] 774	(1)	[2] 1,854
Total	464,633	301.3	1,542	Total	500,874	295.9	1,693

[1] Figures represent output and number of working days in that part of the week included in the calendar year shown. Total production for the week ended Jan. 1, 1955, was 7,430,000 net tons, and for Jan. 5, 1957, 7,415,000 net tons.
[2] Average daily output for the entire week and not for working days in the calendar year shown.

SUMMARY BY STATES

TABLE 10.—Bituminous coal and lignite produced in the United States, by States, 1947–56, with production of maximum year and cumulative production from earliest record to end of 1956, in thousand net tons

State	Maximum production		Production, by years										Total production from earliest record to end of 1956
	Year	Quantity	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	
Alabama	1926	21,001	19,048	18,801	12,934	14,422	13,597	11,383	12,532	10,282	13,088	12,663	910,245
Arkansas	1907	2,670	1,871	1,662	962	1,169	1,107	873	775	477	578	590	96,945
Colorado	1917	12,483	6,358	5,631	4,636	4,259	4,103	3,623	3,575	2,900	3,568	3,502	496,651
Illinois	1918	89,291	67,860	65,342	47,208	56,291	54,200	45,790	46,010	41,971	45,932	48,102	3,469,579
Indiana	1918	30,679	25,449	23,849	16,550	19,957	19,451	16,350	15,812	13,400	16,149	17,089	1,103,496
Iowa	1917	8,966	1,684	1,670	1,725	1,891	1,630	1,381	1,388	1,197	1,258	1,358	347,836
Kansas	1918	7,562	2,745	2,538	2,031	2,125	1,961	2,029	1,715	1,372	742	884	276,879
Kentucky	1947	84,241	84,241	82,084	62,583	78,495	74,972	66,114	65,060	56,964	69,020	74,555	2,440,954
Maryland	1907	5,533	2,051	1,661	668	648	589	588	530	422	512	669	263,783
Missouri	1917	5,671	4,236	4,023	3,647	2,963	3,269	2,955	2,393	2,514	3,232	3,283	278,077
Montana	1944	4,844	3,178	2,898	2,766	2,520	2,345	2,070	1,873	1,491	1,247	846	169,655
New Mexico	1918	4,023	1,443	1,364	1,004	727	783	760	514	123	201	158	124,706
North Dakota	1950	3,261	2,760	2,961	2,967	3,261	3,224	2,984	2,803	(1)	3,102	2,815	[2] 85,829
Ohio	1920	45,878	37,548	38,708	30,961	37,761	37,949	36,209	34,737	32,469	37,870	38,934	1,953,611
Oklahoma	1920	4,849	3,421	3,462	3,022	2,679	2,223	2,193	2,168	1,915	2,164	2,007	174,124
Pennsylvania	1918	178,551	147,079	134,542	89,215	105,870	108,164	89,181	93,331	72,010	85,713	90,287	8,010,347
Tennessee	1956	8,848	6,258	6,483	4,172	5,070	5,401	5,265	5,467	6,429	7,053	8,848	367,845
Utah	1947	7,429	7,429	6,813	6,160	6,670	6,136	6,140	6,544	5,008	6,296	6,522	241,182
Virginia	1956	28,063	20,171	17,999	14,584	17,667	21,400	21,579	19,119	16,387	23,508	28,063	701,846
Washington	1918	4,082	1,118	1,220	899	874	857	844	690	619	610	473	147,416
West Virginia	1947	176,157	176,157	168,862	122,610	144,116	163,310	141,713	134,105	115,996	139,168	155,891	5,956,042
Wyoming	1945	9,847	8,051	6,412	6,001	6,348	6,430	6,088	5,245	2,831	2,927	2,553	395,883
Other States [3]	-------	---------	468	533	563	528	564	729	904	4,929	695	782	182,394
Total	1947	630,624	630,624	599,518	437,868	516,311	533,665	466,841	457,290	391,706	464,633	500,874	28,195,325

[1] North Dakota included in "Other States" in 1954 to avoid disclosing individual operations.

[2] Excludes production of North Dakota in 1954 to avoid disclosing individual operations.

[3] Production, if any, in Alaska, Arizona, California, Georgia, Idaho, Michigan, North Carolina, Oregon, South Dakota, or Texas included in "Other States."

TABLE 11.—Number of mines, production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States

State	Number of active mines	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
		Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
Alabama	225	10, 294, 387	838, 661	1, 530, 296	12, 663, 344	$6. 26	8, 439	206	1, 736, 584	7. 29
Alaska	10	708, 360	13, 464	4, 977	726, 801	8. 77	316	245	77, 509	9. 38
Arizona	2		10, 060		10, 060	6. 56	21	176	3, 703	2. 72
Arkansas	22	579, 112	10, 976	3	590, 091	7. 80	664	164	108, 735	5. 43
California (lignite)	1			12, 000	12, 000	10. 00	3	178	535	22. 43
Colorado	112	2, 658, 915	798, 866	44, 382	3, 502, 163	5. 66	2, 802	199	556, 830	6. 29
Georgia	5		8, 471		8, 471	5. 00	16	123	1, 975	4. 29
Illinois	179	42, 271, 959	5, 602, 952	227, 130	48, 102, 041	3. 84	12, 317	213	2, 621, 768	18. 35
Indiana	101	14, 825, 818	1, 624, 461	639, 154	17, 089, 433	3. 75	4, 057	216	875, 644	19. 52
Iowa	64	816, 210	541, 522	518	1, 358, 250	3. 48	647	197	127, 197	10. 68
Kansas	19	758, 419	125, 191	267	883, 877	4. 36	267	248	66, 340	13. 32
Kentucky	2, 044	67, 992, 229	6, 465, 818	96, 981	74, 555, 028	4. 44	37, 039	193	7, 164, 459	10. 41
Maryland	93	334, 679	334, 196		668, 875	4. 01	605	172	104, 207	6. 42
Missouri	43	2, 821, 661	459, 483	1, 834	3, 282, 978	4. 03	976	221	215, 934	15. 20
Montana:										
Bituminous	18	749, 848	64, 432	5, 985	820, 265	4. 11	359	169	60, 755	13. 50
Lignite	8		25, 835	34	25, 869	3. 70	31	119	3, 679	7. 03
Total Montana	26	749, 848	90, 267	6, 019	846, 134	4. 10	390	165	64, 434	13. 13
New Mexico	26	82, 940	75, 119	385	158, 444	5. 82	197	203	39, 949	3. 97
North Dakota (lignite)	44	2, 159, 662	387, 420	268, 092	2, 815, 174	2. 34	398	204	81, 328	34. 62
Ohio	493	26, 869, 907	10, 535, 931	1, 527, 719	38, 933, 557	3. 82	10, 981	240	2, 640, 374	14. 75
Oklahoma	35	1, 922, 112	76, 635	8, 240	2, 006, 987	6. 15	1, 250	176	219, 890	9. 13
Pennsylvania	1, 710	74, 416, 960	12, 272, 306	3, 597, 426	90, 286, 692	5. 31	48, 325	218	10, 524, 717	8. 58
South Dakota (lignite)	1		24, 519		24, 519	3. 66	9	279	2, 510	9. 77
Tennessee	533	6, 769, 883	2, 067, 445	10, 442	8, 847, 770	4. 02	6, 406	178	1, 138, 064	7. 77
Utah	49	5, 942, 968	330, 054	249, 142	6, 522, 164	5. 28	2, 880	223	642, 313	10. 15
Virginia	1, 089	24, 853, 877	2, 992, 688	216, 210	28, 062, 775	4. 92	15, 857	209	3, 312, 513	8. 47
Washington	13	384, 053	80, 128	8, 439	472, 620	7. 26	431	211	91, 115	5. 19
West Virginia	1, 558	150, 183, 209	3, 855, 581	1, 851, 659	155, 890, 449	5. 29	71, 996	224	16, 146, 284	9. 65
Wyoming	23	2, 349, 711	146, 037	57, 632	2, 553, 380	3. 89	874	191	167, 261	15. 27
Total	8, 520	440, 746, 879	49, 768, 251	10, 358, 947	500, 874, 077	4. 82	228, 163	214	48, 732, 172	10. 28

[1] Includes coal loaded at mines directly into railroad cars or river barges, hauled by trucks to railroad sidings, and hauled by trucks to waterways.
[2] Includes coal transported from mines to point of use by conveyor belts or trams, used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, made into beehive coke at mines, and all other uses at mines.
[3] Value received or charged for coal, f. o. b. mines. Includes a value, estimated by producer, for coal not sold.

TABLE 12.—Number of mines, production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by districts

[Districts as defined in the Bituminous Coal Act of Apr. 26, 1937 (50 Stats. 72, 91-94), and modifications thereto]

District	Number of active mines	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
		Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
1. Eastern Pennsylvania	1,240	33,989,113	5,195,885	1,572,767	40,757,765	$4.94	23,001	212	4,880,979	8.35
2. Western Pennsylvania	587	41,023,078	7,485,252	2,024,672	50,533,002	5.58	26,237	221	5,810,471	8.70
3. Northern West Virginia	487	43,630,173	1,620,552	173,295	45,424,020	4.60	18,070	213	3,846,783	11.81
4. Ohio	493	26,869,907	10,535,931	1,527,719	38,933,557	3.82	10,981	240	2,640,374	14.75
5. Michigan										
6. Panhandle	21	2,031,269	205,633	702,910	2,939,812	4.43	1,176	218	255,988	11.48
7. Southern Numbered 1	812	49,196,136	1,243,081	508,012	50,947,229	6.26	28,061	226	6,353,391	8.02
8. Southern Numbered 2	3,455	123,312,326	10,503,809	777,978	134,594,113	5.00	73,699	206	15,214,313	8.85
9. West Kentucky	141	28,168,200	1,384,014	12,083	29,564,297	3.37	7,148	216	1,541,598	19.18
10. Illinois	179	42,271,959	5,602,952	227,130	48,102,041	3.84	12,317	213	2,621,768	18.35
11. Indiana	101	14,825,818	1,624,461	639,154	17,089,433	3.75	4,057	216	875,644	19.52
12. Iowa	64	816,210	541,522	518	1,358,250	3.48	647	197	127,197	10.68
13. Southeastern	514	13,494,929	1,196,940	1,531,297	16,223,166	5.81	11,291	197	2,225,280	7.29
14. Arkansas-Oklahoma	40	1,533,719	20,919	91	1,554,729	7.00	1,048	179	187,645	8.29
15. Southwestern	79	4,547,585	651,366	10,253	5,209,204	4.44	2,109	201	423,254	12.31
16. Northern Colorado	11	404,483	284,264	9,435	698,182	4.53	342	202	69,250	10.08
17. Southern Colorado	110	2,308,291	533,439	35,037	2,876,767	5.95	2,526	199	503,034	5.72
18. New Mexico	20	29,081	66,342	12,295	107,718	6.14	155	185	28,733	3.75
19. Wyoming	23	2,439,711	146,037	57,632	2,553,380	3.89	874	191	167,261	15.27
20. Utah	49	5,942,968	330,054	249,142	6,522,164	5.28	2,880	223	642,313	10.15
21. North-South Dakota	45	2,159,662	411,939	268,092	2,839,693	2.35	407	206	83,838	33.87
22. Montana	26	749,848	90,267	6,019	846,134	4.10	390	165	64,434	13.13
23. Washington	23	1,092,413	93,592	13,416	1,199,421	8.18	747	226	168,624	7.11
Total	8,520	440,746,879	49,768,251	10,358,947	500,874,077	4.82	228,163	214	48,732,172	10.28

[1] Includes coal loaded at mines directly into railroad cars or river barges, hauled by trucks to railroad sidings, and hauled by trucks to waterways.

[2] Includes coal transported from mines to point of use by conveyor belts or trams, used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, made into beehive coke at mines, and all other uses at mines.

[3] Value received or charged for coal, f. o. b. mines. Includes a value, estimated by producer, for coal not sold.

NUMBER AND SIZE OF MINES

The unit in the statistical record is the mine, and operating companies are requested to make a separate report for each mine because its location is definitely known and can be related to a specific district or county; its identity can be followed through successive changes of

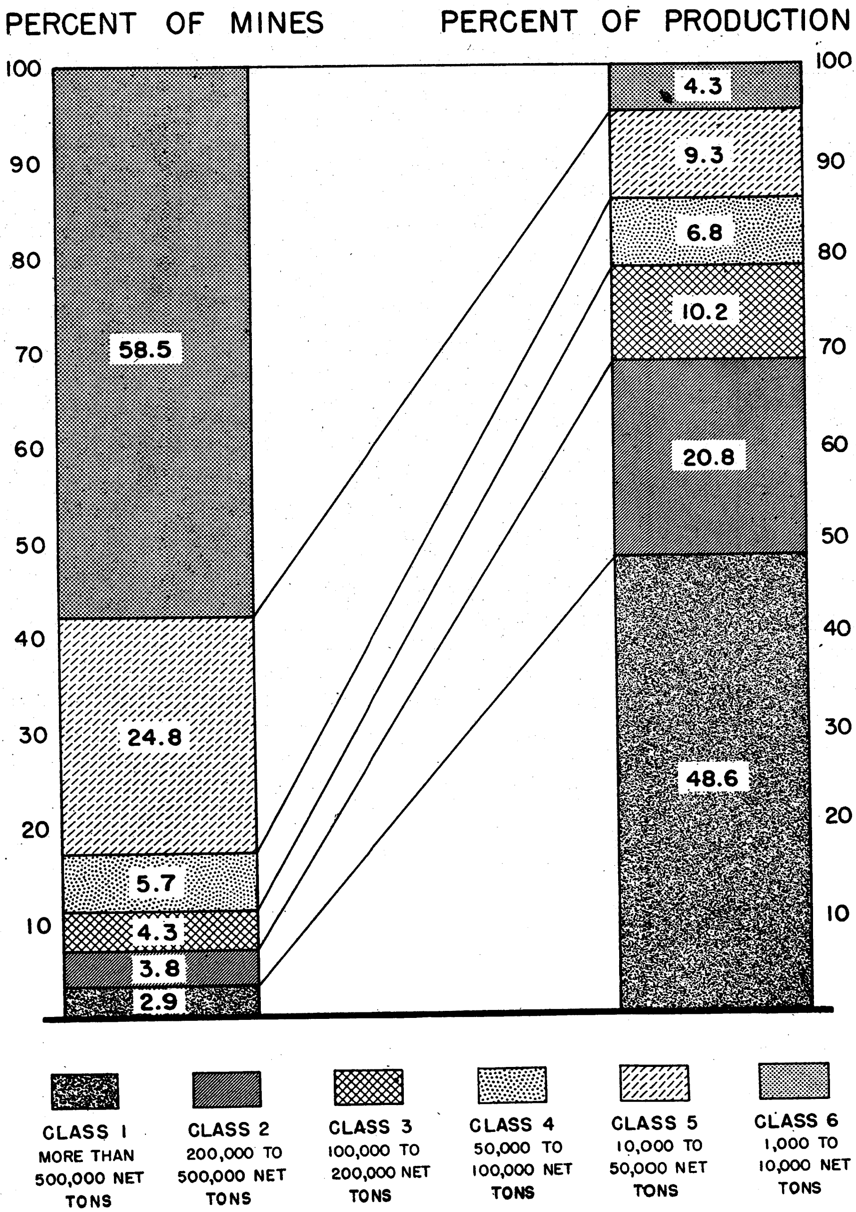

FIGURE 6.—Percentage of number of mines and of production of bituminous-coal and lignite mines in the United States, 1956, by size of output.

TABLE 13.—Number and production of bituminous-coal and lignite mines in the United States, 1956, by States and size of output

State	Class 1—500,000 tons and over				Class 2—200,000 to 500,000 tons				Class 3—100,000 to 200,000 tons			
	Mines		Production		Mines		Production		Mines		Production	
	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage
Alabama	6	2.7	5,877,846	46.4	11	4.9	3,312,854	26.2	9	4.0	1,270,408	10.0
Alaska					1	10.0	254,465	35.0	2	20.0	258,956	35.6
Arizona												
Arkansas									2	9.1	250,464	42.4
California (lignite)												
Colorado	1	.9	703,115	20.1	2	1.8	675,719	19.3	4	3.6	604,484	17.3
Georgia												
Illinois	39	21.8	40,705,098	84.6	11	6.1	3,783,976	7.9	10	5.6	1,348,054	2.8
Indiana	12	11.9	10,655,391	62.4	12	11.9	4,466,035	26.1	4	4.0	602,058	3.5
Iowa					1	1.5	323,642	23.8				
Kansas					1	5.3	496,290	56.1	2	10.5	294,354	33.3
Kentucky	37	1.8	34,096,087	45.7	41	2.0	12,699,036	17.1	55	2.7	7,932,523	10.6
Maryland												
Missouri	1	2.3	669,642	20.4	7	16.3	2,155,750	65.6	1	2.3	138,010	4.2
Montana (bituminous and lignite)					2	7.7	650,875	76.9				
New Mexico												
North Dakota (lignite)					7	15.9	2,359,964	83.8				
Ohio	18	3.7	19,771,696	50.8	19	3.9	5,402,647	13.9	45	9.1	6,059,594	15.5
Oklahoma					4	11.4	997,944	49.7	2	5.7	237,892	11.9
Pennsylvania	43	2.5	43,242,472	47.9	44	2.6	15,113,308	16.7	74	4.3	10,445,328	11.6
South Dakota (lignite)												
Tennessee	1	.2	779,260	8.8	7	1.3	1,965,223	22.2	9	1.7	1,145,992	13.0
Utah	4	8.2	2,291,526	35.1	8	16.3	2,727,767	41.8	5	10.2	680,389	10.4
Virginia	9	.8	8,293,416	29.6	15	1.4	4,456,864	15.9	20	1.9	2,733,051	9.7
Washington									2	15.4	248,007	52.5
West Virginia	74	4.7	75,618,649	48.5	126	8.1	40,901,697	26.2	118	7.6	16,941,987	10.9
Wyoming	1	4.4	579,314	22.7	4	17.4	1,473,383	57.7	1	4.4	108,355	4.2
Total	246	2.9	243,283,512	48.6	323	3.8	104,217,439	20.8	365	4.3	51,299,906	10.2

State	Class 4—50,000 to 100,000 tons				Class 5—10,000 to 50,000 tons				Class 6—less than 10,000 tons				Total		
	Mines		Production		Mines		Production		Mines		Production		Mines	Production (net tons)	
	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage		Total	Average per mine
Alabama	12	5.3	801,753	6.3	34	15.1	804,066	6.4	153	68.0	596,417	4.7	225	12,663,344	56,282
Alaska	1	10.0	88,531	12.2	4	40.0	122,061	16.8	2	20.0	2,788	.4	10	726,801	72,680
Arizona									2	100.0	10,060	100.0	2	10,060	5,030
Arkansas	3	13.6	194,527	33.0	5	22.7	92,721	15.7	12	54.6	52,379	8.9	22	590,091	26,822
California (lignite)					1	100.0	12,000	100.0					1	12,000	12,000
Colorado	10	8.9	700,716	20.0	24	21.4	546,870	15.6	71	63.4	271,259	7.7	112	3,502,163	31,269
Georgia									5	100.0	8,471	100.0	5	8,471	1,694
Illinois	16	8.9	1,118,927	2.3	39	21.8	909,069	1.9	64	35.8	236,917	.5	179	48,102,041	268,726
Indiana	9	8.9	589,990	3.4	28	27.7	593,289	3.5	36	35.6	182,670	1.1	101	17,089,433	169,202
Iowa	5	7.8	358,449	26.4	25	39.1	520,179	38.3	33	51.6	155,980	11.5	64	1,358,250	21,223
Kansas					2	10.5	43,246	4.9	14	73.7	49,987	5.7	19	883,877	46,520
Kentucky	75	3.7	5,009,212	6.7	456	22.3	9,165,098	12.3	1,380	67.5	5,653,072	7.6	2,044	74,555,028	36,475
Maryland	1	1.1	70,159	10.5	20	21.5	369,410	55.2	72	77.4	229,306	34.3	93	668,875	7,192
Missouri	1	2.3	65,190	2.0	8	18.6	156,548	4.8	25	58.2	97,838	3.0	43	3,282,978	76,348
Montana (bituminous and lignite)	1	3.9	80,997	9.6	1	3.8	20,398	2.4	22	84.6	93,864	11.1	26	846,134	32,544
New Mexico	1	3.8	55,951	35.3	2	7.7	24,014	15.2	23	88.5	78,479	49.5	26	158,444	6,094
North Dakota (lignite)	2	4.6	150,856	5.4	10	22.7	209,300	7.4	25	56.8	95,054	3.4	44	2,815,174	63,981
Ohio	45	9.1	3,066,903	7.9	157	31.8	3,767,388	9.7	209	42.4	865,329	2.2	493	38,933,557	78,973
Oklahoma	8	22.9	590,662	29.4	4	11.4	111,214	5.5	17	48.6	69,275	3.5	35	2,006,987	57,342
Pennsylvania	110	6.4	7,710,465	8.5	429	25.1	9,996,710	11.1	1,010	59.1	3,778,409	4.2	1,710	90,286,692	52,799
South Dakota (lignite)					1	100.0	24,519	100.0					1	24,519	24,519
Tennessee	21	3.9	1,440,647	16.3	107	20.1	2,071,644	23.4	388	72.8	1,445,004	16.3	533	8,847,770	16,600
Utah	6	12.3	428,987	6.6	13	26.5	349,618	5.4	13	26.5	43,877	.7	49	6,522,164	133,105
Virginia	34	3.1	2,399,189	8.6	289	26.5	5,875,144	20.9	722	66.3	4,305,111	15.3	1,089	28,062,775	25,769
Washington	1	7.7	64,734	13.7	7	53.8	149,940	31.7	3	23.1	9,939	2.1	13	472,620	36,355
West Virginia	123	7.9	8,944,142	5.7	441	28.3	10,369,876	6.7	676	43.4	3,114,098	2.0	1,558	155,890,449	100,058
Wyoming	3	13.0	234,954	9.2	5	21.7	121,517	4.8	9	39.1	35,857	1.4	23	2,553,380	111,017
Total	488	5.7	34,165,941	6.8	2,112	24.8	46,425,839	9.3	4,986	58.5	21,481,440	4.3	8,520	500,874,077	58,788

ownership; and it is the natural operating unit from the standpoint of cost, mechanical equipment, mining practice, and output per man per day.

EMPLOYMENT AND PRODUCTIVITY

The bituminous-coal and lignite industry has become highly mechanized in recent years. Mechanization has strongly affected production per man per day and the number of employees. In the past 20 years productivity has virtually doubled, and number of employees declined 50 percent.

TABLE 14.—Growth of the bituminous-coal- and lignite-mining industry in the United States, 1890–1956

Year	Men employed	Average number of days worked	Average days lost per man on strike	Net tons per man—		Percentage of underground production—		Percentage of total production—	
				Per day	Per year	Cut by machines [1]	Mechanically loaded	Mechanically cleaned [2]	Mined by stripping
1890	192,204	226	(3)	2.56	579	(3)	(3)	(3)	(3)
1891	205,803	223	(3)	2.57	573	5.3	(3)	(3)	(3)
1892	212,893	219	(3)	2.72	596	(3)	(3)	(3)	(3)
1893	230,365	204	(3)	2.73	557	(3)	(3)	(3)	(3)
1894	244,603	171	(3)	2.84	486	(3)	(3)	(3)	(3)
1895	239,962	194	(3)	2.90	563	(3)	(3)	(3)	(3)
1896	244,171	192	(3)	2.94	564	11.9	(3)	(3)	(3)
1897	247,817	196	(3)	3.04	596	15.3	(3)	(3)	(3)
1898	255,717	211	(3)	3.09	651	19.5	(3)	(3)	(3)
1899	271,027	234	46	3.05	713	22.7	(3)	(3)	(3)
1900	304,375	234	43	2.98	697	24.9	(3)	(3)	(3)
1901	340,235	225	35	2.94	664	25.6	(3)	(3)	(3)
1902	370,056	230	44	3.06	703	26.8	(3)	(3)	(3)
1903	415,777	225	28	3.02	680	27.6	(3)	(3)	(3)
1904	437,832	202	44	3.15	637	28.2	(3)	(3)	(3)
1905	460,629	211	23	3.24	634	32.8	(3)	(3)	(3)
1906	478,425	213	63	3.36	717	34.7	(3)	2.7	(3)
1907	513,258	234	14	3.29	769	35.1	(3)	2.9	(3)
1908	516,264	193	38	3.34	644	37.0	(3)	3.6	(3)
1909	543,152	209	29	3.34	699	37.5	(3)	3.8	(3)
1910	555,533	217	89	3.46	751	41.7	(3)	3.8	(3)
1911	549,775	211	27	3.50	738	43.9	(3)	(3)	(3)
1912	548,632	223	35	3.68	820	46.8	(3)	3.9	(3)
1913	571,882	232	36	3.61	837	50.7	(3)	4.6	(3)
1914	583,506	195	80	3.71	724	51.8	(3)	4.8	0.3
1915	557,456	203	61	3.91	794	55.3	(3)	4.7	.6
1916	561,102	230	26	3.90	896	56.9	(3)	4.6	.8
1917	603,143	243	17	3.77	915	56.1	(3)	4.6	1.0
1918	615,305	249	7	3.78	942	56.7	(3)	3.8	1.4
1919	621,998	195	37	3.84	749	60.0	(3)	3.6	1.2

See footnotes at end of table.

TABLE 14.—Growth of the bituminous-coal- and lignite-mining industry in the United States, 1890–1956—Continued

Year	Men employed	Average number of days worked	Average days lost per man on strike	Net tons per man—		Percentage of underground production—		Percentage of total production—	
				Per day	Per year	Cut by machines [1]	Mechanically loaded	Mechanically cleaned [2]	Mined by stripping
1920	639,547	220	22	4.00	881	60.7	([3])	3.3	1.5
1921	663,754	149	23	4.20	627	66.4	([3])	3.4	1.2
1922	687,958	142	117	4.28	609	64.8	([3])	([3])	2.4
1923	704,793	179	20	4.47	801	68.3	0.3	3.8	2.1
1924	619,604	171	73	4.56	781	71.5	.7	([3])	2.8
1925	588,493	195	30	4.52	884	72.9	1.2	([3])	3.2
1926	593,647	215	24	4.50	966	73.8	1.9	([3])	3.0
1927	593,918	191	153	4.55	872	74.9	3.3	5.3	3.6
1928	522,150	203	83	4.73	959	76.9	4.5	5.7	4.0
1929	502,993	219	11	4.85	1,064	78.4	7.4	6.9	3.8
1930	493,202	187	43	5.06	948	81.0	10.5	8.3	4.3
1931	450,213	160	35	5.30	849	83.2	13.1	9.5	5.0
1932	406,380	146	120	5.22	762	84.1	12.3	9.8	6.3
1933	418,703	167	30	4.78	797	84.7	12.0	10.4	5.5
1934	458,011	178	15	4.40	785	84.1	12.2	11.1	5.8
1935	462,403	179	[4] 7	4.50	805	84.2	13.5	12.2	6.4
1936	477,204	199	21	4.62	920	84.8	16.3	13.9	6.4
1937	491,864	193	[4] 19	4.69	906	([3])	20.2	14.6	7.1
1938	441,333	162	13	4.89	790	87.5	26.7	18.2	8.7
1939	421,788	178	36	5.25	936	87.9	31.0	20.1	9.6
1940	439,075	202	8	5.19	1,049	88.4	35.4	22.2	9.2
1941	456,981	216	27	5.20	1,125	89.0	40.7	22.9	10.7
1942	461,991	246	7	5.12	1,261	89.7	45.2	24.4	11.5
1943	416,007	264	[4] 15	5.38	1,419	90.3	48.9	24.7	13.5
1944	393,347	278	[4] 5	5.67	1,575	90.5	52.9	25.6	16.3
1945	383,100	261	[4] 9	5.78	1,508	90.8	56.1	25.6	19.0
1946	[5] 396,434	214	[4] 23	6.30	1,347	90.8	58.4	26.0	21.1
1947	[5] 419,182	234	[4] 5	6.42	1,504	90.0	60.7	27.7	22.1
1948	[5] 441,631	217	[4] 16	6.26	1,358	90.7	64.3	30.2	23.3
1949	[5] 433,698	157	[4] 15	6.43	1,010	91.4	67.0	35.1	24.2
1950	[5] 415,582	183	[4] 56	6.77	1,239	91.8	69.4	38.5	23.9
1951	[5] 372,897	203	[4] 4	7.04	1,429	93.4	73.1	45.0	22.0
1952	[5] 335,217	186	[4] 6	7.47	1,389	92.8	75.6	48.7	23.3
1953	[5] 293,106	191	[4] 3	8.17	1,560	92.3	79.6	52.9	23.1
1954	[5] 227,397	182	[4] 4	9.47	1,724	88.8	84.0	59.4	25.1
1955	[5] 225,093	210	[4] 4	9.84	2,064	88.1	84.6	58.7	24.8
1956	[5] 228,163	214	[4] 4	10.28	2,195	84.6	84.0	58.4	25.4

[1] Percentages for 1890–1913 are of total production, as separation of strip and underground production is not available for those years.
[2] Percentages for 1906–26 are exclusive of coal cleaned at central washeries operated by consumers.
[3] Data not available.
[4] Bureau of Labor Statistics, U. S. Department of Labor.
[5] Average number of men working daily.

TABLE 15.—Production and average output per man per day of bituminous-coal and lignite mines in the United States, 1956, by States and by underground, strip, and auger mining

State	Production (net tons)				Percentage of total production				Average tons per man per day			
	Underground	Strip	Auger	Total	Underground	Strip	Auger	Total	Underground	Strip	Auger	Total
Alabama	10, 397, 824	2, 260, 108	5, 412	12, 663, 344	82. 1	17. 8	0. 1	100. 0	6. 52	16. 08	20. 00	7. 29
Alaska	264, 006	462, 795		726, 801	36. 3	63. 7		100. 0	5. 42	16. 07		9. 38
Arizona	10, 060			10, 060	100. 0			100. 0	2. 72			2. 72
Arkansas	335, 582	254, 509		590, 091	56. 9	43. 1		100. 0	3. 90	11. 18		5. 43
California (lignite)		12, 000		12, 000		100. 0		100. 0		22. 43		22. 43
Colorado	3, 143, 844	358, 319		3, 502, 163	89. 8	10. 2		100. 0	5. 81	22. 15		6. 29
Georgia	6, 177	2, 294		8, 471	72. 9	27. 1		100. 0	3. 28	24. 93		4. 29
Illinois	28, 426, 705	19, 675, 336		48, 102, 041	59. 1	40. 9		100. 0	15. 26	25. 92		18. 35
Indiana	5, 175, 037	11, 914, 396		17, 089, 433	30. 3	69. 7		100. 0	11. 67	27. 56		19. 52
Iowa	273, 721	1, 084, 529		1, 358, 250	20. 2	79. 8		100. 0	4. 11	17. 88		10. 68
Kansas	13, 023	870, 854		883, 877	1. 5	98. 5		100. 0	2. 60	14. 20		13. 32
Kentucky	56, 987, 349	16, 463, 639	1, 104, 040	74, 555, 028	76. 4	22. 1	1. 5	100. 0	8. 69	29. 19	25. 17	10. 41
Maryland	338, 791	330, 084		668, 875	50. 7	49. 3		100. 0	4. 15	14. 68		6. 42
Missouri	139, 948	3, 143, 030		3, 282, 978	4. 3	95. 7		100. 0	2. 93	18. 69		15. 20
Montana:												
Bituminous	378, 599	441, 666		820, 265	46. 2	53. 8		100. 0	7. 51	42. 74		13. 50
Lignite	17, 471	8, 398		25, 869	67. 5	32. 5		100. 0	7. 52	6. 19		7. 03
Total Montana	396, 070	450, 064		846, 134	46. 8	53. 2		100. 0	7. 51	38. 50		13. 13
New Mexico	146, 768	11, 676		158, 444	92. 6	7. 4		100. 0	3. 85	6. 24		3. 97
North Dakota (lignite)	9, 012	2, 806, 162		2, 815, 174	. 3	99. 7		100. 0	4. 73	35. 33		34. 62
Ohio	13, 423, 771	24, 156, 255	1, 353, 531	38, 933, 557	34. 5	62. 0	3. 5	100. 0	9. 53	20. 41	27. 64	14. 75
Oklahoma	491, 133	1, 515, 854		2, 006, 987	24. 5	75. 5		100. 0	4. 00	15. 59		9. 13
Pennsylvania	66, 488, 562	23, 606, 082	192, 048	90, 286, 692	73. 6	26. 1	. 3	100. 0	7. 40	15. 51	16. 33	8. 58
South Dakota (lignite)		24, 519		24, 519		100. 0		100. 0		9. 77		9. 77
Tennessee	6, 555, 108	1, 966, 635	326, 027	8, 847, 770	74. 1	22. 2	3. 7	100. 0	6. 47	17. 27	31. 30	7. 77
Utah	6, 522, 164			6, 522, 164	100. 0			100. 0	10. 15			10. 15
Virginia	25, 488, 766	1, 968, 514	605, 495	28, 062, 775	90. 8	7. 0	2. 2	100. 0	8. 07	17. 02	15. 90	8. 47
Washington	442, 207	30, 413		472, 620	93. 6	6. 4		100. 0	4. 90	32. 21		5. 19
West Virginia	139, 272, 650	12, 159, 700	4, 458, 099	155, 890, 449	89. 3	7. 8	2. 9	100. 0	9. 03	22. 18	26. 19	9. 65
Wyoming	1, 025, 765	1, 527, 615		2, 553, 380	40. 2	59. 8		100. 0	8. 42	33. 63		15. 27
Total	365, 774, 043	127, 055, 382	8, 044, 652	500, 874, 077	73. 0	25. 4	1. 6	100. 0	8. 62	21. 18	24. 85	10. 28

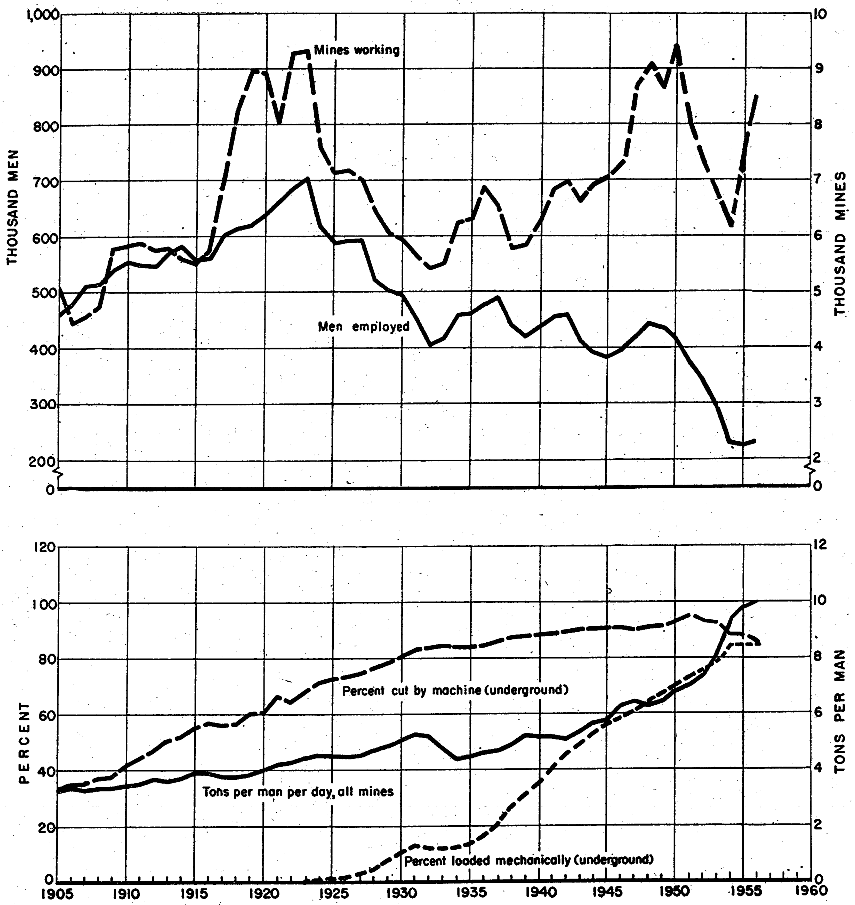

FIGURE 7.—Trends of employment, mechanization, and output per man at bituminous-coal and lignite mines in the United States, 1905–56.

UNDERGROUND MINING

Three-fourths of the output of bituminous coal and lignite is mined underground. The major tasks underground are cutting, drilling shot holes, loading, and haulage. Loading is discussed later in the section on Mechanical Loading. For many years approximately 90 percent of the underground production has been cut by machine. The use of power drills for shot holes has increased rapidly in the past 15 years; 84 percent of the underground production in 1956 came from mines using power drills. Trolley locomotives are the principal method of underground haulage; however, in recent years the use of conveyor haulage has steadily increased.

TABLE 16.—Underground production of bituminous coal and lignite in the United States, 1956, by States and mining methods

State	Cut by hand and shot from solid		Cut by machines				Mined by continuous mining machines		Total underground (net tons)
	Net tons	Percentage of total underground	Net tons	Percentage of total underground	Number of coal-cutting machines	Average output per machine (net tons)	Net tons	Percentage of total underground	
Alabama	449,316	4.3	8,792,787	84.6	249	35,312	1,155,721	11.1	10,397,824
Alaska	247,641	93.8					16,365	6.2	264,006
Arizona	4,500	44.7	5,560	55.3	1	5,560			10,060
Arkansas	7,625	2.3	299,713	89.3	37	8,100	28,244	8.4	335,582
Colorado	712,869	22.7	2,335,446	74.3	267	8,747	95,529	3.0	3,143,844
Georgia	6,177	100.0							6,177
Illinois	37,540	.1	23,618,812	83.1	216	109,346	4,770,353	16.8	28,426,705
Indiana	4,273	.1	5,069,807	97.9	93	54,514	100,957	2.0	5,175,037
Iowa	92,996	34.0	180,725	66.0	24	7,530			273,721
Kansas	3,306	25.4	9,717	74.6	3	3,239			13,023
Kentucky	4,501,641	7.9	51,220,977	89.9	1,663	30,800	1,264,731	2.2	56,987,349
Maryland	145,759	43.0	193,032	57.0	34	5,677			338,791
Missouri			139,948	100.0	22	6,361			139,948
Montana:									
Bituminous	15,089	4.0	363,510	96.0	30	12,117			378,599
Lignite	17,471	100.0							17,471
Total Montana	32,560	8.2	363,510	91.8	30	12,117			396,070
New Mexico	38,115	26.0	108,653	74.0	11	9,878			146,768
North Dakota (lignite)	5,269	58.5	3,743	41.5	2	1,872			9,012
Ohio	47,962	.3	11,367,974	84.7	349	32,573	2,007,835	15.0	13,423,771
Oklahoma	8,934	1.8	482,199	98.2	67	7,197			491,133
Pennsylvania	1,914,569	2.9	47,087,113	70.8	1,816	25,929	17,486,880	26.3	66,488,562
Tennessee	915,185	14.0	5,615,210	85.7	306	18,350	24,713	.3	6,555,108
Utah	12,988	.2	5,926,107	90.9	138	42,943	583,069	8.9	6,522,164
Virginia	4,074,051	16.0	20,457,500	80.3	813	25,163	957,215	3.7	25,488,766
Washington	129,466	29.3	82,530	18.7	12	6,878	230,211	52.0	442,207
West Virginia	2,949,921	2.1	125,184,417	89.9	2,926	42,783	11,138,312	8.0	139,272,650
Wyoming	2,428	.2	977,149	95.3	139	7,030	46,188	4.5	1,025,765
Total	16,345,091	4.5	309,522,629	84.6	9,218	33,578	39,906,323	10.9	365,774,043

TABLE 17.—Use of power drills in underground bituminous-coal and lignite mines in the United States, 1956, by States

State	Number of mines using power drills	Number of power drills				Production in working places where shot holes are power drilled (net tons)			
		Face or coal drills		Roof or rock drills		Hand-held and post-mounted drills	Mobile drills	Total	Percentage of total underground
		Hand-held and post-mounted	Mobile	Rotary	Percussion				
Alabama	105	359		23	79	8,964,889		8,964,889	86.2
Alaska	3	38				214,870		214,870	81.4
Arizona	1	1				5,560		5,560	55.3
Arkansas	5	17		1	8	199,923		199,923	59.6
Colorado	86	311	23	6	91	2,809,145	179,610	2,988,755	95.1
Illinois	85	138	150	103	2	2,346,290	21,277,685	23,623,975	83.1
Indiana	38	56	57	28	2	1,528,664	3,526,040	5,054,704	97.7
Iowa	18	33		3		218,942		218,942	80.0
Kansas	1	1				5,115		5,115	39.3
Kentucky	1,129	1,971	154	165	84	36,837,921	14,126,368	50,964,289	89.4
Maryland	14	21		1		146,254		146,254	43.2
Missouri	11	12		1	1	117,838		117,838	84.2
Montana:									
Bituminous	11	26	1			354,483	7,894	362,377	95.7
Lignite	3	10				17,471		17,471	100.0
Total Montana	14	36	1			371,954	7,894	379,848	95.9
New Mexico	7	10	1	3	1	77,932	27,975	105,907	72.2
North Dakota (lignite)	3	3				6,780		6,780	75.2
Ohio	153	320	53	27	3	7,405,151	3,730,869	11,136,020	83.0
Oklahoma	8	62				479,292		479,292	97.6
Pennsylvania	416	1,591	141	231	537	34,605,576	9,992,794	44,598,370	67.1
Tennessee	213	398	1	18	13	5,679,517	3,050	5,682,567	86.7
Utah	46	56	93	4	75	700,075	5,085,867	5,785,942	88.7
Virginia	727	1,072	28	42	75	19,940,146	2,582,386	22,522,532	88.4
Washington	8	53				197,873		197,873	44.7
West Virginia	930	3,343	173	348	450	104,185,765	18,112,393	122,298,158	87.8
Wyoming	12	244		18		976,706		976,706	95.2
Total	4,033	10,146	875	1,022	1,421	228,022,178	78,652,931	306,675,109	83.8

TABLE 18.—Number of underground bituminous-coal and lignite mines and number of haulage units in use in the United States, in selected years [1]

Units	1924	1946	1948	1949	1950	1951	1952	1953	1954	1955	1956
Underground mines	7,352	5,888	7,108	6,798	7,559	6,225	5,632	5,034	4,653	6,035	6,542
Locomotives:											
Trolley	[2] 12,765	14,110	14,617	14,090	13,822	13,327	12,545	11,311	10,155	9,538	9,445
Battery	1,515	1,011	904	928	949	900	812	678	762	658	861
Other types	443	110	74	59	62	51	41	45	38	40	102
Total	14,723	15,231	15,595	15,077	14,833	14,278	13,398	12,034	10,955	10,236	10,408
Rope haulage units:											
Portable	(3)	4,084	3,886	3,904	4,225	3,875	3,584	2,838	1,926	1,327	1,420
Stationary	(3)	1,009	1,044	1,073	1,037	916	852	727	781	577	575
Total	649	5,093	4,930	4,977	5,262	4,791	4,436	3,565	2,707	1,904	1,995
Shuttle cars:											
Cable reel	(3)	(3)	(3)	2,144	2,782	3,191	3,382	3,797	4,400	4,413	5,047
Battery	(3)	(3)	(3)	623	512	567	462	425	431	241	260
Total	(3)	(3)	(3)	2,767	3,294	3,758	3,844	4,222	4,831	4,654	5,307
"Mother" conveyors	(3)	457	755	860	1,013	1,094	1,066	1,042	1,081	1,002	1,114
Animals	36,352	10,185	10,834	10,313	10,033	7,478	6,555	5,354	5,409	6,440	6,097

[1] Exclusive of lignite and Virginia semianthracite mines in 1946, 1948, and 1949.
[2] Includes combination trolley and battery locomotives.
[3] Data not available.

TABLE 19.—Number of haulage units in use in underground bituminous-coal and lignite mines in the United States, 1955–56, by States

State	Locomotives						Shuttle cars				Rope-haulage units				"Mother" conveyor units		Animals	
	Trolley		Battery		Other types		Cable reel		Battery		Portable		Stationary					
	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956
Alabama	357	352	6	6	6	1	161	174	3	3	9	58	12	20	33	37	227	168
Alaska	2	2	14	15					1	1	1			1				
Arizona																	3	4
Arkansas	4	3	14	9							7		10	8	9	5	11	7
Colorado	96	90	56	53			43	60	18	21	32	42	63	59	4	13	146	105
Georgia																	4	1
Illinois	371	385	76	81			313	346	21	24	3		24	22	96	101	113	95
Indiana	133	131	3	3			80	104	8	1	1	1	6	11		6	42	44
Iowa	3	4	1	2		2		5					7	16		1	74	76
Kansas													3	1			5	6
Kentucky	1,463	1,465	18	32	2	6	747	1,077	24	27	157	103	65	49	177	171	2,299	1,816
Maryland	5	5	1	4				3			1		6	10			76	81
Missouri	2	2	3	3									2	1			27	27
Montana:																		
Bituminous	27	19	1	1			6	6			3	3	4	5			9	11
Lignite									2	2							5	4
Total Montana	27	19	1	1			6	6	2	2	3	3	4	5			14	15
New Mexico	4	3	4	6				3				4	11	5	1		31	36
North Dakota (lignite)							1						2				7	5
Ohio	329	323	19	22		2	143	148		2	7	14	19	20	39	35	169	150
Oklahoma	10	9	7	5			4	4			1	2	4	3	4	3	4	5
Pennsylvania	2,491	2,483	115	122	7	17	863	996	63	77	826	813	161	185	170	203	699	863
Tennessee	154	157	10	8	1	5	32	47			2	5	2	5	11	13	489	467
Utah	161	157	21	14			144	151	8	7	5	7	29	28	22	29	20	15
Virginia	688	571	114	277	7	53	263	210	2	5	44	33	39	33	31	36	1,005	1,111
Washington	34	23	1								5	14	25	19			3	4
West Virginia	3,104	3,162	170	194	17	16	1,584	1,680	91	90	159	257	59	50	398	453	967	993
Wyoming	100	99	4	4			29	33			64	64	24	24	7	8	5	3
Total	9,538	9,445	658	861	40	102	4,413	5,047	241	260	1,327	1,420	577	575	1,002	1,114	6,440	6,097

TABLE 20.—Number and production of underground bituminous-coal and lignite mines using "mother" conveyors and number and length of units in use, in the United States, 1945–56 [1]

Year	Number of mines	Production (net tons)	Number of units in use	Average length (feet)	Total length (miles)
1945	117	40, 189, 857	359	1, 438	97.6
1946	161	46, 022, 710	457	1, 484	128.5
1947	199	70, 690, 920	594	1, 470	165.3
1948	270	81, 821, 361	755	1, 460	208.8
1949	314	69, 947, 713	860	1, 514	246.7
1950	374	92, 413, 644	1, 013	1, 538	294.9
1951	372	99, 643, 003	1, 094	1, 568	325.0
1952	358	92, 168, 992	1, 066	1, 526	308.2
1953	322	100, 155, 249	1, 042	1, 541	303.9
1954	291	83, 211, 284	1, 081	1, 626	332.9
1955	314	97, 677, 313	1, 002	1, 682	319.6
1956	314	126, 717, 518	1, 114	1, 656	349.4

[1] Includes all belt conveyors 500 feet or more long used for underground transportation of coal, except main slope conveyors. Excludes lignite and Virginia semianthracite mines in 1945–49.

TABLE 21.—Number and production of underground bituminous-coal and lignite mines using "mother" conveyors, and number and length of units in use in the United States, 1955–56, by States [1]

State	Number of mines		Production (net tons)		Number of units in use		Average length (feet)		Total length (miles)	
	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956
Alabama	6	6	2, 380, 340	4, 264, 585	33	37	1, 677	1, 706	10.5	12.0
Arkansas	3	2	89, 523	72, 759	9	5	713	724	1.2	.7
Colorado	3	3	102, 295	807, 612	4	13	1, 573	1, 608	1.2	4.0
Illinois	17	16	13, 846, 060	16, 526, 302	96	101	1, 974	2, 334	35.9	44.6
Indiana	-----	2	----------	615, 856	-----	6	-------	750	------	.9
Kentucky	53	44	19, 775, 419	19, 749, 555	177	171	1, 584	1, 598	53.1	51.8
New Mexico	1	-----	3, 788	----------	1	-----	900	-------	.2	------
Ohio	13	13	4, 387, 737	6, 517, 124	39	36	1, 603	1, 617	11.8	11.0
Oklahoma	2	1	426, 278	53, 833	4	3	1, 438	1, 250	1.1	.7
Pennsylvania	44	51	16, 318, 000	18, 445, 600	170	203	1, 645	1, 676	53.0	64.4
Tennessee	5	5	802, 544	817, 716	11	13	1, 318	1, 562	2.7	3.8
Utah	11	13	1, 599, 950	1, 578, 770	22	29	1, 091	1, 129	4.5	6.2
Virginia	10	14	2, 171, 170	4, 964, 639	31	36	1, 339	1, 731	7.9	11.8
West Virginia	142	141	35, 032, 207	51, 916, 336	398	453	1, 788	1, 579	134.8	135.5
Wyoming	4	3	742, 002	386, 831	7	8	1, 314	1, 350	1.7	2.0
Total	314	314	97, 677, 313	126, 717, 518	1, 002	1, 114	1, 682	1, 656	319.6	349.4

[1] Includes all mines using belt conveyors, other than main-slope conveyors, 500 feet or more long for underground transportation of coal.

STRIP MINING

Strip mines have two substantial advantages over underground mines. First, the output per man per day in strip mines is more than double that in underground mines; and, second, the average value of strip coal, f. o. b. mines, is about one-third lower than that of coal from underground mines.

The rapid growth of strip mining was made possible by development of larger and improved stripping and drilling equipment and trucks. The most notable change recently in stripping equipment has been the

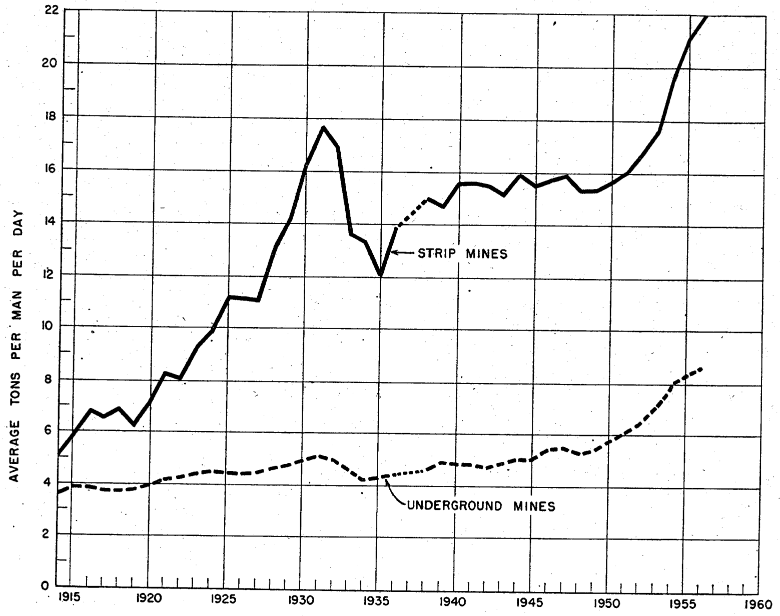

FIGURE 8.—Average tons per man per day at bituminous-coal and lignite mines in the United States, 1914–56, by underground mines and strip mines.

replacement of virtually all steam shovels by diesel-powered and large electric shovels and draglines.

An increase in the average capacity of trucks used in strip mines has reduced the number required. The average hauling distance from strip mines to tipples or ramps has remained approximately 4 miles.

The average thickness of overburden at all bituminous-coal and lignite strip mines in the United States was 42 feet in 1955.[3] Several strip mines handled an average of more than 60 feet of overburden in 1955, and a few handled more than 70 feet.

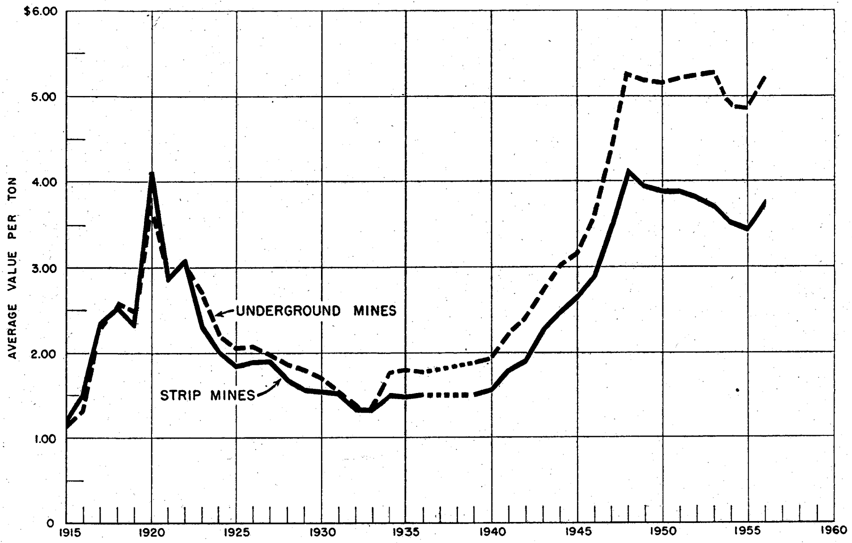

FIGURE 9.—Average value per ton, f. o. b. mines, of bituminous coal and lignite produced in the United States, 1915–56, by underground mines and strip mines.

[3] Work cited in footnote 2.

TABLE 22.—Growth of strip mining at bituminous-coal and lignite mines in the United States, 1914–56, compared with underground and auger mining

Year	Production (thousand net tons)				Percentage of total mined by stripping	Average tons per man per day				Average value per ton, f. o. b. mine				Number of strip mines	Number of power shovels and draglines
	Underground mines	Strip mines [1]	Auger mines	Total		Underground mines	Strip mines [1]	Auger mines	Total	Underground mines	Strip mines [1]	Auger mines	Total		
1914	421,423	1,281	---------	422,704	0.3	3.71	5.06	---------	3.71	[2]	[2]	---------	$1.17	[3] 35	48
1915	439,792	2,832	---------	442,624	.6	3.90	5.81	---------	3.91	$1.13	$1.18	---------	1.13	[3] 60	87
1916	498,587	3,933	---------	502,520	.8	3.88	6.67	---------	3.90	1.32	1.51	---------	1.32	[3] 79	111
1917	546,001	5,790	---------	551,791	1.0	3.75	6.52	---------	3.77	2.26	2.34	---------	2.26	[3] 126	182
1918	571,098	8,288	---------	579,386	1.4	3.76	6.81	---------	3.78	2.58	2.54	---------	2.58	[3] 165	276
1919	460,225	5,635	---------	465,860	1.2	3.82	6.21	---------	3.84	2.49	2.33	---------	2.49	[3] 168	287
1920	559,807	8,860	---------	568,667	1.5	3.97	7.20	---------	4.00	3.74	4.12	---------	3.75	[3] 174	312
1921	410,865	5,057	---------	415,922	1.2	4.18	8.28	---------	4.20	2.89	2.87	---------	2.89	[3] 155	279
1922	412,059	10,209	---------	422,268	2.4	4.24	8.09	---------	4.28	3.02	3.07	---------	3.02	272	379
1923	552,625	11,940	---------	564,565	2.1	4.43	9.32	---------	4.47	2.69	2.31	---------	2.68	263	442
1924	470,080	13,607	---------	483,687	2.8	4.50	9.91	---------	4.56	2.20	2.00	---------	2.20	234	420
1925	503,182	16,871	---------	520,053	3.2	4.45	11.18	---------	4.52	2.05	1.84	---------	2.04	227	389
1926	556,444	16,923	---------	573,367	3.0	4.42	11.13	---------	4.50	2.07	1.89	---------	2.06	237	410
1927	499,385	18,378	---------	517,763	3.6	4.47	11.06	---------	4.55	1.99	1.90	---------	1.99	255	455
1928	480,956	19,789	---------	500,745	4.0	4.61	13.02	---------	4.73	1.87	1.69	---------	1.86	250	415
1929	514,721	20,268	---------	534,989	3.8	4.73	14.08	---------	4.85	1.79	1.57	---------	1.78	200	411
1930	447,684	19,842	---------	467,526	4.3	4.93	16.21	---------	5.06	1.71	1.54	---------	1.70	218	341
1931	363,157	18,932	---------	382,089	5.0	5.12	17.68	---------	5.30	1.54	1.51	---------	1.54	235	314
1932	290,069	19,641	---------	309,710	6.3	4.99	16.95	---------	5.22	1.31	1.32	---------	1.31	255	332
1933	315,360	18,270	---------	333,630	5.5	4.60	13.59	---------	4.78	1.34	1.33	---------	1.34	289	389
1934	338,578	20,790	---------	359,368	5.8	4.23	13.28	---------	4.40	1.76	1.49	---------	1.75	344	458
1935	348,726	23,647	---------	372,373	6.4	4.32	12.01	---------	4.50	1.79	1.47	---------	1.77	368	507
1936	410,962	28,126	---------	439,088	6.4	4.42	13.91	---------	4.62	1.77	1.49	---------	1.76	381	562
1937	413,780	31,751	---------	445,531	7.1	[2]	[2]	---------	4.69	[2]	[2]	---------	1.94	449	[2]
1938	318,138	30,407	---------	348,545	8.7	4.60	15.00	---------	4.89	[2]	[2]	---------	1.95	465	737
1939	357,133	37,722	---------	394,855	9.6	4.92	14.68	---------	5.25	1.88	1.49	---------	1.84	537	914
1940	417,604	43,167	---------	460,771	9.4	4.86	15.63	---------	5.19	1.94	1.56	---------	1.91	638	1,071
1941	459,078	55,071	---------	514,149	10.7	4.83	15,59	---------	5.20	2.23	1.79	---------	2.19	769	1,321
1942	515,490	67,203	---------	582,693	11.5	4.74	15.52	---------	5.12	2.41	1.90	---------	2.36	834	1,438
1943	510,492	79,685	---------	590,177	13.5	4.89	15.15	---------	5.38	2.75	2.28	---------	2.69	1,004	1,839
1944	518,678	100,898	---------	619,576	16.3	5.04	15.89	---------	5.67	3.01	2.48	---------	2.92	1,240	2,312

1945	467,630	109,987	----------	577,617	19.0	5.04	15.46	----------	5.78	3.16	2.65	----------	3.06	1,370	2,439
1946	420,958	112,964	----------	533,922	21.1	5.43	15.73	----------	6.30	3.59	2.87	----------	3.44	1,445	2,744
1947	491,229	139,395	----------	630,624	22.1	5.49	15.93	----------	6.42	4.35	3.47	----------	4.16	1,750	3,254
1948	460,012	139,506	----------	599,518	23.3	5.31	15.28	----------	6.26	5.26	4.11	----------	4.99	1,971	3,712
1949	331,823	106,045	----------	437,868	24.2	5.42	15.33	----------	6.43	5.18	3.94	----------	4.88	1,761	3,576
1950	392,844	123,467	----------	516,311	23.9	5.75	15.66	----------	6.77	5.15	3.87	----------	4.84	1,870	3,877
1951	416,047	117,618	----------	533,665	22.0	6.08	16.02	----------	7.04	5.21	3.88	----------	4.92	1,784	3,810
1952	356,425	108,910	1,506	466,841	23.3	6.37	16.77	20.07	7.47	5.24	3.81	4.31	4.90	1,643	3,527
1953	349,551	105,448	2,291	457,290	23.1	7.01	17.62	25.30	8.17	5.27	3.75	4.15	4.92	1,554	3,390
1954	289,112	98,134	4,460	391,706	25.1	7.99	19.64	24.12	9.47	4.87	3.52	3.41	4.52	1,329	3,409
1955	343,465	115,093	6,075	464,633	24.8	8.28	21.12	22.22	9.84	4.86	3.48	3.60	4.50	1,617	3,265
1956	365,774	127,055	8,045	500,874	25.4	8.62	21.18	24.85	10.28	5.20	3.74	4.17	4.82	1,728	3,705

[1] Includes power strip pits proper and excludes horse stripping operations and mines combining stripping and underground in the same operation for the period 1914–42. The years 1943–56 include data on all strip mines.

[2] Data not available.

[3] Exclusive of horse stripping operations.

TABLE 23.—Number and production of bituminous-coal and lignite strip mines, and units of stripping and loading equipment in use in the United States, 1932–56

Year	Number of strip mines	Production (thousand net tons)	Number of power shovels and dragline excavators: By type of power					By capacity (in cubic yards) of dipper or bucket				By type of machine		Total	Number of carryall scrapers	Number of bulldozers
			Electric	Diesel-electric	Diesel	Gasoline	Steam	Less than 3	3–5, inclusive	6–12, inclusive	More than 12	Power shovels	Dragline excavators			
1932	255	19,641	[1] 105	(2)	[3] 61	(4)	166	(5)	(5)	(5)	(5)	(5)	(5)	332	(5)	(5)
1933	289	18,270	[1] 117	(2)	[3] 103	(4)	169	(5)	(5)	(5)	(5)	(5)	(5)	389	(5)	(5)
1934	344	20,790	[1] 121	(2)	[3] 149	(4)	188	(5)	(5)	(5)	(5)	(5)	(5)	458	(5)	(5)
1935	368	23,647	[1] 139	(2)	[3] 194	(4)	174	(5)	(5)	(5)	(5)	(5)	(5)	507	(5)	(5)
1936	381	28,126	[1] 151	(2)	[3] 223	(4)	188	(5)	(5)	(5)	(5)	(5)	(5)	562	(5)	(5)
1937	449	31,751	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
1938	465	30,407	[1] 155	(2)	[3] 440	(4)	142	(5)	(5)	(5)	(5)	(5)	(5)	737	(5)	(5)
1939	537	37,722	[1] 184	(2)	[3] 524	(4)	206	(5)	(5)	(5)	(5)	(5)	(5)	914	(5)	(5)
1940	638	43,167	[1] 194	(2)	[3] 697	(4)	180	(5)	(5)	(5)	(5)	(5)	(5)	1,071	(5)	(5)
1941	769	55,071	[1] 210	(2)	[3] 911	(4)	200	1,009	153	95	64	(5)	(5)	1,321	(5)	(5)
1942	834	67,203	[1] 219	(2)	[3] 1,020	(4)	199	1,114	159	97	68	(5)	(5)	1,438	(5)	(5)
1943	1,004	79,685	[1] 234	(2)	[3] 1,433	(4)	172	1,488	173	106	72	(5)	(5)	1,839	(5)	(5)
1944	1,240	100,898	[1] 244	(2)	[3] 1,902	(4)	166	1,900	225	113	74	(5)	(5)	2,312	(5)	(5)
1945	1,370	109,987	[1] 256	(2)	[3] 2,042	(4)	141	2,004	243	117	75	(5)	(5)	2,439	(5)	(5)
1946	1,445	112,964	[1] 261	(2)	1,619	753	111	2,256	302	112	74	2,406	338	2,744	263	(5)
1947	1,750	139,395	[1] 301	(2)	2,279	591	83	2,685	362	123	84	2,822	432	3,254	275	(5)
1948	1,971	139,506	[1] 337	(2)	2,675	646	54	3,048	446	130	88	3,177	535	3,712	362	(5)
1949	1,761	106,045	[1] 352	(2)	2,646	527	51	2,931	367	168	110	3,011	565	3,576	320	(5)
1950	1,870	123,467	[1] 348	(2)	2,880	607	42	3,182	416	170	109	3,247	630	3,877	286	(5)
1951	1,784	117,618	[1] 346	(2)	2,905	533	26	3,088	420	187	115	3,164	646	3,810	220	(5)
1952	1,643	108,910	[1] 321	(2)	2,642	545	19	2,800	425	183	119	2,892	635	3,527	218	(5)
1953	1,554	105,448	[1] 317	(2)	2,629	446	17	2,692	413	193	111	2,793	616	3,409	244	1,954
1954	1,329	98,134	[1] 381	(2)	2,617	374	18	2,480	579	211	120	2,605	785	3,390	269	2,599
1955	1,617	115,093	[1] 315	(2)	2,603	337	10	2,381	550	223	111	2,592	673	3,265	187	2,106
1956	1,728	127,055	285	136	2,914	365	5	2,693	634	249	129	2,899	806	3,705	226	2,381

[1] Includes diesel electric shovels.
[2] Included with electric shovels.
[3] Includes gasoline shovels.
[4] Included with diesel shovels.
[5] Data not available.

TABLE 24.—Number and production of bituminous-coal and lignite strip mines and units of stripping and loading equipment in use in the United States, 1956, by States

State	Number of strip mines	Production (net tons)	Number of power shovels and dragline excavators												Number of carryall scrapers	Number of bull-dozers
			By type of power					By capacity (in cubic yards) of dipper or bucket				By type of machine		Total		
			Elec-tric	Diesel-elec-tric	Diesel	Gas	Steam	Less than 3	3–5, inclu-sive	6–12, inclu-sive	More than 12	Power shovels	Drag-line exca-vators			
Alabama	35	2,260,108	5	7	70	5		61	15	7	4	69	18	87	9	37
Alaska	5	462,795		5	4	1		9	1			9	1	10	4	28
Arkansas	7	254,509	1	2	10	1		7	5	1	1	7	7	14		8
California (lignite)	1	12,000		1	1			1	1			1	1	2		3
Colorado	6	358,319	1		6			3	3	1		5	2	7	3	11
Georgia	1	2,294				1		1				1		1		1
Illinois	85	19,675,336	82	11	69	18		55	45	43	37	111	69	180	5	112
Indiana	58	11,914,396	44	8	59	34		72	34	19	20	85	60	145	5	89
Iowa	31	1,084,529	4		43	18		43	20	1	1	35	30	65	6	33
Kansas	15	870,854	5	4	12	2	2	15	3	4	3	15	10	25	4	18
Kentucky:																
Eastern	74	2,063,466			102	6		98	10			107	1	108		55
Western	64	14,400,173	30	2	124	9		80	43	25	17	125	40	165	3	91
Total Kentucky	138	16,463,639	30	2	226	15		178	53	25	17	232	41	273	3	146
Maryland	25	330,084		1	24	10		32	3			30	5	35		21
Missouri	28	3,143,030	21	5	11	6	1	16	11	7	10	29	15	44	1	29
Montana:																
Bituminous	2	441,666	7		1	2		3	1	2	4	6	4	10	1	2
Lignite	5	8,398			1	3		4				3	1	4	2	4
Total Montana	7	450,064	7		2	5		7	1	2	4	9	5	14	3	6
New Mexico	2	11,676			2	1		3				3		3		3
North Dakota (lignite)	39	2,806,162	19	2	14	17		32	9	10	1	41	11	52	25	35
Ohio	245	24,156,255	43	35	467	80		446	115	47	17	507	118	625	53	472
Oklahoma	21	1,515,854	7	3	25			11	12	8	4	19	16	35		19
Pennsylvania	680	23,606,082	9	44	1,274	116		1,178	195	63	7	1,072	371	1,443	56	887
South Dakota (lignite)	1	24,519			2	1		2	1			1	2	3	1	1
Tennessee	72	1,966,635			127	8		118	15	2		131	4	135		48
Virginia	32	1,968,514	2		70	3		65	10			75		75	10	55
Washington	1	30,413				1		1				1		1		2
West Virginia	185	12,159,700	1	7	384	19	1	328	74	7	3	396	16	412	24	301
Wyoming	8	1,527,615	4		11	3	1	9	8	2		15	4	19	14	16
Total	1,728	127,055,382	285	137	2,913	365	5	2,693	634	249	129	2,899	806	3,705	226	2,381

TABLE 25.—Summary of operations at bituminous-coal and lignite strip mines using power drills in bank or overburden in the United States, 1946–56

Year	Number of mines	Production at mines using power drills: Quantity (net tons)	Production at mines using power drills: Percentage of total strip production	Number of power drills
1946	514	75, 375, 841	66. 7	764
1947	598	95, 915, 346	68. 8	875
1948	728	98, 809, 393	72. 3	1, 195
1949	756	78, 146, 655	73. 7	1, 256
1950	692	87, 205, 280	70. 6	1, 201
1951	650	85, 331, 204	72. 5	1, 125
1952	629	79, 252, 284	73. 0	1, 070
1953	603	80, 259, 365	76. 1	1, 048
1954	541	70, 107, 205	71. 4	983
1955	564	85, 623, 050	74. 4	953
1956	696	96, 278, 779	75. 8	1, 041

TABLE 26.—Summary of operations at bituminous-coal and lignite strip mines using power drills in bank or overburden in the United States, 1955–56, by States

State	Number of mines		Production at mines using power drills				Number of power drills					
			Quantity (net tons)		Percentage of total strip production		Horizontal		Vertical		Total	
	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956
Alabama	18	20	1,482,670	1,978,689	70.2	87.5	17	19	16	18	33	37
Alaska	5	4	398,824	449,238	99.7	97.1	5	3	10	8	15	11
Arkansas	5	4	225,992	207,931	86.7	81.7	9	8	1		10	8
Colorado	4	3	344,341	338,122	96.5	94.4	2	2	3	5	5	7
Illinois	34	44	16,092,686	16,511,784	86.2	83.9	33	39	24	30	57	69
Indiana	35	38	10,004,968	11,158,830	89.5	93.7	42	39	25	22	67	61
Iowa	24	22	859,366	972,015	89.4	89.6	24	24	17	12	41	36
Kansas	9	7	670,604	823,902	92.2	94.6	10	11	5		15	11
Kentucky:												
Eastern	14	24	940,430	1,059,571	49.4	51.3	14	21	8	5	22	26
Western	23	32	10,506,152	13,444,080	89.5	93.4	25	31	24	28	49	59
Total Kentucky	37	56	11,446,582	14,503,651	83.9	88.1	39	52	32	33	71	85
Maryland	1	2	13,649	10,423	5.8	3.2	1	1			1	1
Missouri	12	12	2,513,868	2,738,011	81.7	87.1	18	16	4	2	22	18
Montana:												
Bituminous	1	1	795,955	440,166	99.3	99.7		1	2	3	2	4
Lignite		1		1,232		14.7				1		1
Total Montana	1	2	795,955	441,398	99.3	98.1		1	2	4	2	5
New Mexico	1	1	20,976	10,513	76.9	90.0			2	2	2	2
North Dakota (lignite)	2	3	388,603	382,570	12.6	13.6	2	2	1	2	3	4
Ohio	98	112	19,338,748	19,615,789	80.7	81.2	94	97	57	61	151	158
Oklahoma	7	15	878,165	1,320,128	59.8	87.1	10	13	3	9	13	22
Pennsylvania	169	193	10,818,270	12,297,787	52.7	52.1	160	179	98	95	258	274
South Dakota (lignite)	1	1	23,982	24,519	93.0	100.0	1	1			1	1
Tennessee	15	19	1,084,242	610,825	66.3	31.1	23	17	8	9	31	26
Virginia	5	16	732,993	1,330,014	74.7	67.6	9	16	5	8	14	24
Washington	1		31,714		100.0				2		2	
West Virginia	75	116	6,108,210	9,050,181	65.1	74.4	77	106	53	66	130	172
Wyoming	5	6	1,347,642	1,502,459	87.6	98.4	6	6	3	3	9	9
Total	564	696	85,623,050	96,278,779	74.4	75.8	582	652	371	389	953	1,041

TABLE 27.—Summary of method of haulage from bituminous-coal and lignite strip mines to tipple or ramp, in the United States, 1948–56 [1]

Year	Strip mines reporting method of haulage							Strip mines not reporting method of haulage—production (net tons)	Total strip production (net tons)
	Strip mines using trucks				Strip mines using rail, rail and truck, truck and tram—production (net tons)	Production of strip mines reporting			
	Production (net tons)	Number of trucks	Average capacity per truck (net tons)	Average distance hauled (miles)		Quantity (net tons)	Percentage of total strip production		
1948	97, 450, 399	7, 214	9. 4	3. 7	6, 327, 989	103, 778, 388	74. 4	35, 727, 532	139, 505, 920
1949	73, 229, 556	6, 694	10. 1	3. 7	5, 365, 432	78, 594, 988	74. 1	27, 450, 311	106, 045, 299
1950	88, 666, 733	6, 564	10. 3	3. 8	4, 364, 333	93, 031, 066	75. 3	30, 435, 498	123, 466, 564
1951	87, 427, 029	6, 173	10. 6	4. 0	2, 424, 994	89, 852, 023	76. 4	27, 765, 653	117, 617, 676
1952	88, 589, 637	5, 799	11. 3	4. 0	2, 296, 744	90, 886, 381	83. 5	18, 023, 375	108, 909, 756
1953	84, 764, 694	5, 287	12. 2	4. 0	2, 104, 609	86, 869, 303	82. 4	18, 579, 266	105, 448, 569
1954	73, 794, 489	4, 250	13. 2	3. 9	1, 203, 753	74, 998, 242	76. 4	23, 136, 008	98, 134, 250
1955	94, 150, 171	4, 798	13. 3	3. 9	2, 290, 600	96, 440, 771	83. 9	18, 651, 998	115, 092, 769
1956	103, 127, 374	5, 432	13. 3	4. 4	1, 056, 627	104, 184, 001	82. 0	22, 871, 381	127, 055, 382

[1] Excludes lignite in 1948 and 1949.

TABLE 28.—Summary of method of haulage from bituminous-coal and lignite strip mines to tipple or ramp, in the United States, 1956, by States

State	Strip mines reporting method of haulage							Strip mines not reporting method of haulage—production (net tons)	Total strip production (net tons)
	Strip mines using trucks				Strip mines using rail, rail and truck, truck and tram—production (net tons)	Production of strip mines reporting			
	Production (net tons)	Number of trucks	Average capacity per truck (net tons)	Average distance hauled (miles)		Quantity (net tons)	Percentage of total strip production		
Alabama	1,723,111	113	12.5	4.3	----------	1,723,111	76.2	536,997	2,260,108
Alaska	449,238	33	12.5	3.5	----------	449,238	97.1	13,557	462,795
Arkansas	246,524	30	8.6	5.6	----------	246,524	96.9	7,985	254,509
California (lignite)	12,000	3	12.0	5.0	----------	12,000	100.0	----------	12,000
Colorado	340,571	16	17.1	2.7	----------	340,571	95.0	17,748	358,319
Georgia	----------	----------	----------	----------	----------	----------	----------	2,294	2,294
Illinois	19,423,082	368	25.3	3.2	----------	19,423,082	98.7	252,254	19,675,336
Indiana	11,001,535	260	21.5	3.3	616,461	11,617,996	97.5	296,400	11,914,396
Iowa	981,755	65	9.7	2.9	----------	981,755	90.5	102,774	1,084,529
Kansas	829,225	26	19.1	1.8	----------	829,225	95.2	41,629	870,854
Kentucky	11,460,188	328	15.3	3.2	----------	11,460,188	69.6	5,003,451	16,463,639
Maryland	129,273	16	12.2	8.7	----------	129,273	39.2	200,811	330,084
Missouri	2,771,912	75	27.0	3.0	----------	2,771,912	88.2	371,118	3,143,030
Montana:									
Bituminous	1,500	4	6.0	.2	440,166	441,666	100.0	----------	441,666
Lignite	4,258	4	4.5	.2	----------	4,258	50.7	4,140	8,398
Total Montana	5,758	8	5.3	.2	440,166	445,924	99.1	4,140	450,064
New Mexico	11,676	4	4.5	.3	----------	11,676	100.0	----------	11,676
North Dakota (lignite)	2,739,265	89	13.6	2.5	----------	2,739,265	97.6	66,897	2,806,162
Ohio	20,676,989	880	13.1	5.8	----------	20,676,989	85.6	3,479,266	24,156,255
Oklahoma	1,144,361	95	9.1	3.9	----------	1,144,361	75.5	371,493	1,515,854
Pennsylvania	16,996,412	2,076	10.4	5.3	----------	16,996,412	72.0	6,609,670	23,606,082
South Dakota (lignite)	24,519	4	6.0	1.0	----------	24,519	100.0	----------	24,519
Tennessee	553,890	133	10.0	10.0	----------	553,890	28.2	1,412,745	1,966,635
Virginia	1,256,318	87	10.3	4.4	----------	1,256,318	63.8	712,196	1,968,51
Washington	30,413	6	10.0	1.0	----------	30,413	100.0	----------	30,413
West Virginia	8,795,030	680	12.8	6.1	----------	8,795,030	72.3	3,364,670	12,159,700
Wyoming	1,524,329	37	14.6	2.1	----------	1,524,329	99.8	3,286	1,527,615
Total	103,127,374	5,432	13.3	4.4	1,056,627	104,184,001	82.0	22,871,381	127,055,382

TABLE 29.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1956, by States and counties

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Alabama:						
Blount	2	213,568	87	165	14,324	14.91
Cullman	2	31,060	31	82	2,517	12.34
De Kalb	1	54,895	25	193	4,811	11.41
Jefferson	8	602,209	131	235	30,819	19.54
Marion	(1)	(1)	(1)	(1)	(1)	(1)
St. Clair	1	3,000	3	134	402	7.46
Tuscaloosa	9	660,394	201	210	42,198	15.65
Walker	9	652,387	204	211	42,977	15.18
Winston	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	3	42,595	13	190	2,472	17.23
Total Alabama	35	2,260,108	695	202	140,520	16.08
Alaska	5	462,795	129	223	28,799	16.07

For footnote, see end of table.

TABLE 29.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1956, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Arkansas:						
Franklin	1	6,873	4	248	992	6.93
Johnson	5	215,916	77	218	16,686	12.94
Sebastian	1	31,720	31	164	5,083	6.24
Total Arkansas	7	254,509	112	203	22,761	11.18
California: Amador	1	12,000	3	178	535	22.43
Colorado:						
El Paso	1	5,027	1	214	214	23.50
Fremont	1	10,670	5	96	469	22.76
Jackson	1	2,051	3	219	657	3.12
Routt	3	340,571	77	193	14,840	22.95
Total Colorado	6	358,319	86	188	16,180	22.15
Georgia: Walker	1	2,294	1	92	92	24.93
Illinois:						
Bureau	1	765,398	119	274	32,681	23.42
Fulton	13	5,296,651	776	252	195,520	27.09
Gallatin	9	116,587	36	186	6,681	17.45
Greene	1	5,108	2	240	480	10.63
Grundy	1	217,991	51	224	11,510	18.94
Hancock	1	28,691	10	187	1,874	15.31
Jackson	4	591,803	104	245	25,443	23.26
Johnson	(1)	(1)	(1)	(1)	(1)	(1)
Kankakee	1	621,087	146	224	32,792	18.94
Knox	(1)	(1)	(1)	(1)	(1)	(1)
La Salle	(1)	(1)	(1)	(1)	(1)	(1)
Livingston	1	2,595	4	66	249	10.44
Peoria	5	393,054	73	223	16,175	24.30
Perry	5	3,694,565	446	284	126,743	29.15
Randolph	2	114,735	11	310	3,367	34.08
St. Clair	3	1,616,025	185	279	51,630	31.30
Saline	9	1,081,694	353	180	63,629	17.00
Schuyler	2	7,574	6	169	991	7.64
Vermilion	2	929,709	116	283	32,800	28.34
Will	1	155,154	43	231	9,997	15.52
Williamson	17	2,377,223	310	222	68,785	34.56
Other counties	7	1,659,692	344	226	77,617	21.38
Total Illinois	85	19,675,336	3,135	242	758,964	25.92
Indiana:						
Clay	8	849,183	177	251	44,413	19.12
Daviess	2	69,825	50	223	11,208	6.23
Fountain	1	45,894	28	149	4,165	11.02
Gibson	1	161,138	55	193	10,620	15.17
Greene	10	1,443,439	242	188	45,448	31.76
Knox	1	339,686	67	249	16,654	20.40
Martin	1	10,075	6	164	957	10.53
Owen	(1)	(1)	(1)	(1)	(1)	(1)
Parke	3	20,649	14	177	2,552	8.09
Pike	8	2,419,625	470	260	122,142	19.81
Spencer	(1)	(1)	(1)	(1)	(1)	(1)
Sullivan	4	448,975	74	160	11,809	38.02
Vermillion	2	248,898	51	251	12,810	19.43
Vigo	3	545,230	85	225	19,131	28.50
Warrick	10	5,078,176	446	252	112,498	45.14
Other counties	4	233,603	89	201	17,849	13.09
Total Indiana	58	11,914,396	1,854	233	432,256	27.56
Iowa:						
Appanoose	1	13,671	18	192	3,496	3.91
Davis	2	48,959	13	261	3,360	14.57
Mahaska	9	142,144	44	230	10,175	13.97
Marion	9	684,673	117	259	30,215	22.66
Monroe	3	63,425	11	284	3,016	21.03
Polk	1	9,886	4	290	1,160	8.52
Van Buren	2	25,971	18	182	3,360	7.73
Wapello	4	95,800	26	223	5,881	16.29
Total Iowa	31	1,084,529	251	242	60,663	17.88

For footnote, see end of table.

TABLE 29.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1956, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Kansas:						
Bourbon	1	5,496	5	146	736	7.47
Cherokee	6	552,806	116	284	32,905	16.80
Coffey	2	2,424	6	126	755	3.21
Crawford	5	309,067	94	281	26,552	11.64
Osage	1	1,061	3	140	392	2.71
Total Kansas	15	870,854	224	274	61,340	14.20
Kentucky, Eastern:						
Bell	10	310,117	79	179	14,154	21.91
Boyd	1	204,078	86	294	25,288	8.07
Carter	1	38,990	17	195	3,321	11.74
Clay	6	354,015	86	217	18,642	18.99
Harlan	3	60,464	8	255	2,109	28.67
Jackson	4	17,038	18	126	2,275	7.49
Knott	3	11,110	13	45	585	19.00
Knox	8	146,036	39	200	7,755	18.83
Laurel	4	105,975	51	178	9,019	11.75
Leslie	1	10,450	7	105	738	14.16
Letcher	2	31,829	12	117	1,378	23.09
McCreary	5	196,394	43	230	9,995	19.65
Morgan	5	69,603	43	119	5,122	13.59
Pulaski	6	204,313	97	209	20,370	10.03
Rockcastle	3	117,900	56	178	10,034	11.75
Wayne	2	27,300	13	178	2,323	11.75
Whitley	10	157,854	54	177	9,625	16.40
Total Eastern Kentucky	74	2,063,466	722	198	142,733	14.46
Kentucky, Western:						
Butler	1	2,150	6	53	338	6.37
Daviess	4	1,054,242	81	290	23,611	44.65
Hancock	1	2,000	2	54	131	15.21
Hopkins	29	5,990,721	772	227	175,167	34.20
Muhlenberg	9	3,369,224	506	202	102,222	32.96
Ohio	8	2,787,432	317	269	85,269	32.69
Webster	12	1,194,404	152	227	34,500	34.62
Total Western Kentucky	64	14,400,173	1,836	229	421,238	34.19
Total Kentucky	138	16,463,639	2,558	220	563,971	29.19
Maryland:						
Allegany	11	138,677	54	176	9,421	14.72
Garrett	14	191,407	66	199	13,065	14.65
Total Maryland	25	330,084	120	187	22,486	14.68
Missouri:						
Barton	3	239,798	82	271	22,306	10.75
Bates	2	671,392	123	230	28,293	23.73
Boone	2	5,355	6	169	1,028	5.21
Callaway	1	138,010	42	299	12,581	10.97
Dade	1	15,713	9	285	2,563	6.13
Henry	8	946,165	191	257	48,973	19.32
Macon	1	387,878	62	234	14,620	26.53
Putnam	2	21,756	12	132	1,583	13.74
Ralls	1	4,695	6	150	899	5.22
Randolph	1	302,233	49	234	11,392	26.53
St. Clair	2	323,779	59	299	17,511	18.49
Vernon	4	86,256	29	222	6,413	13.45
Total Missouri	28	3,143,030	670	251	168,162	18.69
Montana (bituminous): Rosebud	2	441,666	49	211	10,334	42.74

For footnote, see end of table.

TABLE 29.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1956, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Montana (lignite):						
Dawson	3	4,140	3	102	320	12.94
Sheridan	2	4,258	10	106	1,036	4.11
Total Montana (lignite)	5	8,398	13	104	1,356	6.19
Total Montana	7	450,064	62	189	11,690	38.50
New Mexico: McKinley	2	11,676	9	208	1,871	6.24
North Dakota (lignite):						
Adams	1	38,589	8	175	1,397	27.62
Bowman	1	211,948	18	242	4,349	48.73
Burke	2	459,507	61	233	14,306	32.12
Burleigh	1	18,867	3	160	480	39.31
Divide	1	286,874	44	217	9,566	29.99
Dunn	3	12,609	7	142	1,046	12.06
Grant	3	23,770	5	192	959	24.78
Hettinger	3	11,508	12	136	1,637	7.03
McKenzie	1	1,625	4	81	324	5.00
McLean	4	123,772	25	193	4,883	25.35
Mercer	5	993,690	103	214	22,107	44.95
Morton	4	29,751	13	167	2,237	13.30
Oliver	3	9,739	5	88	412	23.63
Stark	3	79,933	16	167	2,665	29.99
Ward	4	503,980	58	225	13,053	38.61
Total North Dakota (lignite)	39	2,806,162	382	208	79,421	35.33
Ohio:						
Athens	6	140,537	54	112	6,058	23.20
Belmont	21	1,210,939	238	216	51,442	23.54
Carroll	8	468,790	112	277	31,083	15.08
Columbiana	35	1,382,936	324	260	84,120	16.44
Coshocton	10	916,301	186	273	50,765	18.05
Gallia	4	509,416	109	259	28,348	17.97
Guernsey	4	484,753	86	286	24,644	19.67
Harrison	11	6,896,893	941	331	311,372	22.15
Hocking	4	36,789	17	151	2,515	14.63
Holmes	2	28,344	8	262	2,162	13.11
Jackson	14	623,050	120	268	32,066	19.43
Jefferson	19	2,379,057	428	248	106,208	22.40
Lawrence	6	314,050	82	193	15,773	19.91
Mahoning	12	645,976	141	265	37,340	17.30
Meigs	5	492,525	116	217	25,167	19.57
Morgan	4	1,477,098	166	249	41,422	35.66
Muskingum	9	803,366	152	248	37,593	21.37
Noble	7	1,133,996	128	257	32,936	34.43
Perry	13	1,362,711	281	261	73,225	18.61
Portage	1	135,034	25	312	7,796	17.32
Stark	17	807,696	238	264	62,954	12.83
Tuscarawas	25	1,375,190	349	255	88,894	15.47
Vinton	5	109,796	64	98	6,285	17.47
Washington	(1)	(1)	(1)	(1)	(1)	(1)
Wayne	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	3	421,012	80	292	23,393	18.00
Total Ohio	245	24,156,255	4,445	266	1,183,561	20.41
Oklahoma:						
Craig	4	39,132	21	302	6,192	6.32
Haskell	5	398,043	102	252	25,763	15.45
Latimer	(1)	(1)	(1)	(1)	(1)	(1)
Le Flore	4	192,604	68	103	6,991	27.55
McIntosh	(1)	(1)	(1)	(1)	(1)	(1)
Okmulgee	2	5,051	9	27	247	20.44
Rogers	2	341,189	109	236	25,692	13.28
Sequoyah	1	267,890	52	355	18,324	14.62
Wagoner	1	1,234	4	82	346	3.57
Other counties	2	270,711	51	269	13,703	19.76
Total Oklahoma	21	1,515,854	416	237	97,258	15.59

For footnote, see end of table.

TABLE 29.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1956, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Pennsylvania:						
Allegheny	40	668,412	256	180	46,066	14.51
Armstrong	41	1,047,077	341	168	57,311	18.27
Beaver	15	398,601	152	213	32,407	12.30
Bedford	4	37,409	17	118	2,004	18.67
Blair	3	89,620	32	218	6,942	12.92
Bradford	(1)	(1)	(1)	(1)	(1)	(1)
Butler	44	1,771,295	380	269	102,092	17.35
Cambria	22	635,655	371	191	70,786	8.98
Cameron	(1)	(1)	(1)	(1)	(1)	(1)
Centre	24	1,441,475	385	234	90,092	16.00
Clarion	36	3,341,519	741	257	190,400	17.55
Clearfield	119	5,293,287	1,528	228	348,471	15.19
Clinton	7	554,047	124	244	30,210	18.34
Elk	13	225,173	140	138	19,345	11.64
Fayette	39	458,896	144	159	22,888	20.05
Fulton	1	40,529	41	60	2,464	16.45
Greene	4	15,463	14	103	1,455	10.63
Huntingdon	5	125,355	74	159	11,793	10.63
Indiana	43	1,281,341	454	211	95,837	13.37
Jefferson	36	1,004,009	394	212	83,528	12.02
Lawrence	23	787,899	167	252	42,066	18.73
Lycoming	1	41,793	13	306	3,976	10.51
McKean	3	103,864	30	225	6,671	15.57
Mercer	13	587,269	186	187	34,873	16.84
Somerset	65	1,508,474	470	196	92,036	16.39
Tioga	4	51,412	19	187	3,541	14.52
Venango	10	812,029	149	269	40,021	20.29
Washington	22	957,748	288	217	62,516	15.32
Westmoreland	40	244,273	134	129	17,227	14.18
Other counties	3	82,158	23	223	5,135	16.00
Total Pennsylvania	680	23,606,082	7,067	215	1,522,153	15.51
South Dakota (lignite): Dewey	1	24,519	9	279	2,510	9.77
Tennessee:						
Anderson	6	314,915	110	180	19,769	15.93
Bledsoe	4	28,811	20	77	1,540	18.71
Campbell	9	180,509	56	181	10,079	17.91
Claiborne	8	173,821	108	164	17,647	9.85
Cumberland	6	67,333	34	124	4,272	15.76
Fentress	2	129,657	25	183	4,580	28.31
Grundy	3	101,662	15	199	2,980	34.11
Hamilton	3	64,958	12	205	2,369	27.42
Marion	1	4,178	8	160	1,282	3.26
Morgan	12	333,863	77	189	14,592	22.88
Overton	1	1,403	1	105	105	13.36
Scott	9	332,545	111	193	21,386	15.55
Sequatchie	2	46,480	32	160	5,130	9.06
Van Buren	3	54,500	27	124	3,360	16.22
White	3	132,000	25	190	4,760	27.73
Total Tennessee	72	1,966,635	661	172	113,851	17.27
Virginia:						
Buchanan	5	53,305	30	94	2,786	19.13
Dickenson	1	253,564	90	253	22,741	11.15
Russell	4	163,540	65	252	16,354	10.00
Tazewell	1	22,580	14	180	2,520	8.96
Wise	21	1,475,525	330	216	71,281	20.70
Total Virginia	32	1,968,514	529	219	115,682	17.02
Washington: Kittitas	1	30,413	6	159	944	32.21

For footnote, see end of table.

TABLE 29.—Stripping operations in the bituminous-coal and lignite fields of the United States, 1956, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
West Virginia:						
Barbour	15	1,163,735	218	161	35,126	33.13
Boone	3	172,641	59	96	5,705	30.26
Brooke	5	352,534	62	284	17,609	20.02
Clay	(1)	(1)	(1)	(1)	(1)	(1)
Fayette	13	422,215	136	165	22,458	18.80
Gilmer	2	135,559	22	114	2,498	54.27
Grant	1	6,716	4	250	895	7.50
Greenbrier	7	407,501	123	231	28,378	14.36
Hancock	1	3,807	10	24	238	16.00
Harrison	35	2,303,932	492	216	106,319	21.67
Kanawha	5	280,758	49	228	11,132	25.22
Lewis	6	1,187,833	180	246	44,306	26.81
Logan	2	259,750	53	219	11,514	22.56
Marion	3	50,323	24	92	2,206	22.81
McDowell	10	810,292	135	239	32,206	25.16
Mercer	8	205,603	73	200	14,592	14.09
Mineral	1	9,058	12	79	948	9.55
Mingo	(1)	(1)	(1)	(1)	(1)	(1)
Monongalia	3	11,166	7	125	895	12.47
Nicholas	6	761,531	171	242	41,433	18.38
Pocahontas	1	29,094	42	266	11,190	2.60
Preston	12	826,745	116	259	29,976	27.58
Putnam	1	110,503	22	283	6,236	17.72
Raleigh	12	1,062,051	161	221	35,639	29.80
Randolph	6	197,922	80	153	12,187	16.24
Taylor	5	239,101	65	256	16,558	14.44
Tucker	4	133,095	65	234	15,228	8.74
Upshur	5	172,881	46	148	6,737	25.66
Wyoming	9	642,738	142	171	24,365	26.38
Other counties	4	200,616	58	202	11,702	17.14
Total West Virginia	185	12,159,700	2,627	209	548,276	22.18
Wyoming:						
Campbell	1	373,958	27	308	8,297	45.07
Carbon	2	162,309	32	229	7,324	22.16
Converse	1	6,608	3	253	760	8.69
Lincoln	1	579,314	52	249	12,945	44.75
Sheridan	2	402,140	71	225	15,964	25.19
Sweetwater	1	3,286	4	35	140	23.48
Total Wyoming	8	1,527,615	189	242	45,430	33.63
Total United States	1,728	127,055,382	26,240	229	5,999,376	21.18

[1] Included in "Other counties" to avoid disclosing individual operations.

AUGER MINING

Augers are generally used in areas where strip mining has become economically impracticable because of thick overburden. They were used first about 1945, and separate statistics on coal-recovery augers begin with 1952. The rapidly expanded production of coal by stripping during World War II in the mountainous areas of the northern Appalachian region left many miles of highwall containing exposed coal seams. After several years of experimentation, large, efficient augers as much as 60 inches in diameter were developed to recover the coal from these exposed coal seams.

Production at auger mines increased rapidly from less than 2 million tons in 1952 to more than 8 million tons in 1956. Augers were used to mine coal in 7 States in 1956, and sales of augers, reported by 4 manufacturers indicate continued rapid growth of auger mining.

TABLE 30.—Auger mines in the bituminous-coal and lignite fields of the United States, 1956, by States and counties

State and county	Number of auger mines	Equipment in use (number of units)				Mined by augers (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
		Augers	Power shovels	Power drills	Bulldozers					
Alabama: Jefferson	1	1				5,412	3	90	271	20.00
Eastern Kentucky:										
Bell	1	1				10,880	3	190	570	19.09
Breathitt	1	1				36,000	10	188	1,880	19.15
Floyd	1	1				2,385	2	105	210	11.36
Harlan	4	4				51,363	32	202	6,518	7.88
Knott	2	2				5,500	2	120	275	20.00
Knox	2	2				17,757	7	120	888	20.00
Leslie	3	2		2	1	88,750	38	77	2,935	30.24
Letcher	1	1				1,000	1	50	50	20.00
Perry	5	5	1		2	139,567	29	201	5,765	24.21
Pike	23	24	2	2	9	728,719	137	178	24,388	29.88
Total Eastern Kentucky	43	43	3	4	12	1,081,921	261	167	43,479	24.88
Western Kentucky:										
Hopkins	1	1				22,119	2	190	380	58.21
Total Kentucky	44	44	3	4	12	1,104,040	263	167	43,859	25.17
Ohio:										
Athens	3	3			3	14,715	4	158	614	23.97
Belmont	6	7			6	139,530	38	190	7,256	19.23
Carroll	2	2				6,639	4	103	413	16.08
Columbiana	5	6			2	53,385	14	169	2,371	22.52
Gallia	2	2			4	180,848	19	320	6,116	29.57
Guernsey	1	1				58,818	6	315	1,889	31.14
Harrison	7	8	1		8	286,947	44	178	7,847	36.57
Jefferson	5	5			4	189,212	34	156	5,287	35.79
Meigs	3	5	1		5	199,918	28	246	6,971	28.68
Muskingum	1	1			1	24,910	4	208	830	30.01
Noble	2	2			1	14,863	6	184	1,106	13.44
Perry	1	1			1	140,061	26	216	5,698	24.58
Tuscarawas	3	3			2	40,523	10	221	2,266	17.88
Wayne	1	1			1	3,162	2	149	298	10.61
Total Ohio	42	47	2		38	1,353,531	239	205	48,962	27.64
Pennsylvania:										
Allegheny	1	1				3,598	1	197	197	18.30
Armstrong	5	4			2	34,900	8	132	997	35.02
Beaver	1	1			1	4,126	1	165	165	25.01
Butler	4	4		1	2	45,343	16	153	2,478	18.30
Cambria	3	3				10,077	5	141	707	14.25
Clarion	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Clearfield	9	9				30,528	24	116	2,801	10.90
Clinton	1	1				9,096	3	244	733	12.41
Elk	1	1			1	7,154	2	155	310	23.08
Indiana	4	5			1	23,600	14	143	2,065	11.43
Washington	1	1				10,000	4	174	741	13.50
Westmoreland	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	3	3				13,626	22	26	567	24.03
Total Pennsylvania	33	33		1	7	192,048	100	118	11,761	16.33

For footnote, see end of table.

TABLE 30.—Auger mines in the bituminous-coal and lignite fields of the United States, 1956, by States and counties—Continued

State and county	Number of auger mines	Equipment in use (number of units)				Mined by augers (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
		Augers	Power shovels	Power drills	Bulldozers					
Tennessee:										
Anderson	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Campbell	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Claiborne	1	2			2	6,000	6	115	690	8.70
Fentress	1	1				113,000	11	200	2,200	51.36
Marion	1	1				17,000	9	170	1,530	11.11
Morgan	1	2			2	24,030	7	203	1,421	16.91
Scott	3	3			2	28,694	10	155	1,599	17.95
White	1	1				117,239	11	200	2,200	53.29
Other counties	2	3				20,064	13	60	775	25.89
Total Tennessee	10	13			6	326,027	67	155	10,415	31.30
Virginia:										
Buchanan	9	10			5	186,779	45	181	8,131	22.97
Dickenson	2	2			2	67,812	20	203	4,097	16.55
Russell	3	3			2	93,498	28	240	6,785	13.78
Tazewell	1	1				2,782	3	81	243	11.46
Wise	10	10			3	254,624	151	126	18,988	13.41
Total Virginia	25	26			12	605,495	247	154	38,244	15.90
West Virginia:										
Barbour	1	1			1	88,667	12	231	2,770	32.00
Boone	3	4			1	333,377	49	208	10,242	32.55
Brooke	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Fayette	8	8			5	322,767	97	178	17,251	18.71
Gilmer	1	1			1	107,916	10	203	2,030	53.16
Harrison	16	18			11	973,605	170	245	41,768	23.31
Kanawha	13	16	8	3	10	740,298	143	211	30,155	24.55
Lewis	2	3			3	185,710	7	300	2,194	84.66
Logan	7	7	2	1	9	365,911	89	170	15,170	24.12
McDowell	7	10			4	274,699	53	232	12,285	22.36
Mercer	4	8			2	76,802	27	137	3,723	20.63
Mingo	8	12	1		9	564,045	87	175	15,249	36.99
Nicholas	1	1			1	24,321	2	219	438	55.52
Pocahontas	1	4			1	20,619	9	221	1,988	10.37
Putnam	1	1				6,752	2	135	270	25.01
Raleigh	5	7			3	187,266	37	191	7,085	26.43
Randolph	2	3				18,711	9	154	1,458	12.83
Taylor	1					16,117	5	138	703	22.92
Upshur	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Webster	3	3	3	3	1	34,739	6	180	1,157	30.02
Wyoming	9	14	1		7	89,542	52	66	3,418	26.20
Other counties	2	3			2	26,235	18	48	857	30.61
Total West Virginia	95	124	15	7	71	4,458,099	884	193	170,211	26.19
Total United States	250	288	20	12	146	8,044,652	1,803	180	323,723	24.85

1 Included in "Other counties" to avoid disclosing individual operations.

TABLE 31.—Units of coal-recovery augers sold to bituminous-coal and lignite mines for surface use in the United States, as reported by manufacturers, 1945–52 and 1953–56, by States

State	1945–52 [1]	1953	1954	1955	1956
Alabama			1		
Colorado				1	
Illinois				1	2
Kentucky		5	10	11	15
Maryland		1			
Ohio		11	12	5	12
Pennsylvania		8	9	8	10
Tennessee		2			2
Virginia		2	1	6	7
West Virginia		26	21	33	41
Total	259	55	54	65	89

[1] Separate data by years and States not available.

A few coal-recovery augers have been sold for underground use; these units and the coal produced by them have been included with coal loaded mechanically underground.

MECHANICAL LOADING

In the past decade mechanical loading of bituminous coal and lignite at underground mines has increased from 58 to 84 percent of the total output. The rise in wages probably was the most important factor causing the rapid progress in mechanization; however, increased mechanization resulted in a 59-percent rise in productivity in 1956 over 1946. Although overall mechanization gained gradually during this period, the following changes occurred in the methods of loading: Mobile loading into mine cars decreased from 54 to 12 percent of the total mechanically loaded; mobile loading into shuttle cars increased from 19 to 65 percent; Duckbills or other self-loading conveyors decreased from 8 to 1 percent; hand-loaded conveyors decreased from 15 to 5 percent; and continuous-mining machines, first used in 1948, handled 13 percent of the total mechanically loaded output in 1956, compared with 10 percent in 1955.

Most of the 24 mines listed as using continuous-mining machines used mobile loading machines in conjunction with the continuous-mining machines. In 1956, reports showed 188 mobile loading machines used in this manner. All coal mined by continuous-mining machines was credited to this category, regardless of the method used in loading it out of the mine.

Sales of all types of mechanical loading equipment except scrapers increased in 1956 over 1955. No scrapers were sold in 1955 or 1956. Bridge conveyor sales are listed separately in 1956 for the first time.

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TABLE 32.—Growth of mechanical loading at underground bituminous-coal and lignite mines in the United States, 1923–56

(Production in thousand net tons)

Year	Underground production mechanically loaded									Underground production mechanically loaded, percent	Number of mechanical loading units					
	Loaded by machines				Continuous-mining machines	Handled by conveyors			Total mechanically loaded		Mobile loading machines	Scrapers	Conveyors equipped with Duckbills or other self-loading heads	Continuous-mining machines	Pit-car loaders	Hand-loaded conveyors
	Mobile loading machines	Scrapers	Conveyors equipped with Duckbills or other self-loading heads	Total		Pit-car loaders	Hand-loaded conveyors	Total								
1923	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	2 1,880	2 0.3	(1)	(1)	(1)	----------	(1)	(1)
1924	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	2 3,496	2 .7	(1)	(1)	(1)	----------	(1)	(1)
1925	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	2 6,243	2 1.2	(1)	(1)	(1)	----------	(1)	(1)
1926	7,786	1,554	682	10,022	----------	523	(1)	(1)	2 10,545	2 1.9	295	133	27	----------	(1)	(1)
1927	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	16,500	3.3	(1)	(1)	(1)	----------	(1)	(1)
1928	11,811	1,548	1,200	14,559	----------	4,117	2,883	7,000	21,559	4.5	397	130	82	----------	1,040	(1)
1929	16,432	1,550	1,309	19,291	----------	14,979	3,592	18,571	37,862	7.4	488	126	99	----------	2,521	(1)
1930	20,073	1,637	1,628	23,338	----------	19,116	4,528	23,644	46,982	10.5	545	150	140	----------	2,876	(1)
1931	19,407	1,471	1,811	22,689	----------	19,172	5,701	24,873	47,562	13.1	583	146	165	----------	3,428	(1)
1932	14,825	1,132	1,630	17,587	----------	12,590	5,640	18,230	35,817	12.3	548	128	159	----------	3,112	(1)
1933	17,865	991	1,656	20,512	----------	11,413	5,896	17,309	37,821	12.0	523	93	132	----------	2,453	525
1934	20,750	1,004	2,082	23,836	----------	11,089	6,508	17,597	41,433	12.2	534	119	157	----------	2,288	574
1935	24,675	1,118	2,595	28,388	----------	11,098	7,691	18,789	47,177	13.5	657	78	179	----------	2,098	670
1936	40,970	1,273	3,240	45,483	----------	10,538	10,956	21,494	66,977	16.3	980	106	234	----------	1,851	936
1937	(1)	(1)	(1)	(1)	----------	(1)	(1)	(1)	83,500	20.2	(1)	(1)	(1)	----------	(1)	(1)
1938	57,824	1,031	4,248	63,103	----------	5,653	16,337	21,990	85,093	26.7	1,405	117	346	----------	1,392	1,526
1939	76,442	1,007	6,759	84,208	----------	5,038	21,466	26,504	110,712	31.0	1,573	131	559	----------	873	1,834
1940	100,962	1,255	10,362	112,579	----------	3,979	31,312	35,291	147,870	35.4	1,720	116	656	----------	697	2,263
1941	126,478	1,290	14,918	142,686	----------	3,447	40,534	43,981	186,667	40.7	1,985	109	788	----------	607	2,807
1942	160,301	1,405	20,683	182,389	----------	2,252	47,262	50,514	232,903	45.2	2,301	93	1,062	----------	481	3,041
1943	179,008	1,349	22,917	203,274	----------	2,669	43,862	46,531	249,805	48.9	2,525	83	1,226	----------	321	3,191
1944	202,875	1,341	23,164	227,380	----------	1,835	44,974	46,809	274,189	52.9	2,737	87	1,331	----------	241	3,236
1945	198,668	1,252	21,506	221,426	----------	986	40,100	41,086	262,512	56.1	2,950	87	1,383	----------	142	3,385
1946	186,975	917	19,678	207,570	----------	623	37,148	37,771	245,341	58.3	3,200	75	1,521	----------	93	3,470
1947	229,836	854	21,921	252,611	----------	353	45,193	45,546	298,157	60.7	3,569	67	1,531	----------	71	3,979
1948	3 232,667	743	19,634	253,044	(4)	184	42,578	42,762	295,806	64.3	3 3,980	56	1,632	(4)	37	4,125
1949	3 177,239	339	13,994	191,572	(4)	54	30,750	30,804	222,376	67.0	3 4,205	46	1,483	(4)	17	4,312
1950	3 222,976	318	13,985	237,279	(4)	39	35,407	35,446	272,725	69.4	3 4,318	39	1,329	(4)	12	4,434
1951	5 252,663	126	13,884	266,673	(4)	(6)	37,583	37,583	304,256	73.1	5 4,410	22	1,242	(4)	(6)	3,904
1952	218,982	77	10,590	229,649	8,215	(6)	31,130	31,130	268,994	75.5	4,083	19	1,049	152	(6)	3,569
1953	232,585	239	8,531	241,355	11,830	(6)	25,144	25,144	278,329	79.6	3,985	29	849	219	(6)	2,994
1954	206,546	411	4,672	211,629	16,336	(6)	15,005	15,005	242,970	84.0	4,314	48	633	325	(6)	2,162
1955	243,204	141	4,369	247,714	27,460	(6)	15,497	15,497	290,671	84.6	3,819	23	487	385	(6)	1,925
1956	248,341	156	3,727	252,224	39,907	(6)	15,271	15,271	307,402	84.0	3,854	35	437	510	(6)	1,819

1 Data not available.
2 Exclusive of tonnage "Handled by conveyors."
3 Includes continuous-mining machines.
4 Included with mobile loading machines.
5 Includes continuous-mining machines and augers.
6 Canvass of pit-car loaders discontinued in 1951.

TABLE 33.—Bituminous coal and lignite mechanically loaded underground in the United States, 1955–56, by types of loading equipment

Type of equipment	1955		1956	
	Net tons	Percentage of total	Net tons	Percentage of total
Mobile loading machines:				
Loading direct into mine cars	47, 396, 995	16. 3	35, 428, 276	11. 5
Loading onto conveyors	12, 504, 662	4. 3	14, 069, 160	4. 6
Loading into shuttle cars	183, 302, 753	63. 1	198, 843, 677	64. 7
Continuous-mining machines	27, 460, 204	9. 5	39, 906, 323	13. 0
Scrapers	140, 673		156, 050	
Conveyors equipped with Duckbills or other self-loading heads	4, 369, 008	1. 5	3, 726, 958	1. 2
Hand-loaded conveyors	15, 497, 019	5. 3	15, 271, 104	5. 0
Total mechanically loaded	290, 671, 314	100. 0	307, 401, 548	100. 0

TABLE 34.—Comparative changes in underground mechanical loading of bituminous coal and lignite by principal types of loading devices in the United States, 1955–56, by States

State	Net tons by— Loading machines [1]		Continuous-mining machines		Hand-loaded conveyors		Total mechanically loaded (net tons)		Total production at mines using mechanical loading devices (net tons)		Handled by each class (percent) Loading machines [1]		Continuous-mining machines		Hand-loaded conveyors	
	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956
Alabama	7, 779, 453	7, 494, 663	1, 310, 775	1, 155, 721	708, 760	595, 011	9, 798, 988	9, 245, 395	9, 914, 886	9, 320, 638	79. 4	81. 1	13. 4	12. 5	7. 2	6. 4
Alaska	24, 250	92, 470	16, 213	16, 365	25, 000	31, 531	65, 463	140, 366	235, 139	262, 805	37. 0	65. 9	24. 8	11. 6	38. 2	22. 5
Arkansas	----	----	----	28, 244	287, 840	295, 870	287, 840	324, 114	287, 840	324, 114	----	----	----	8. 7	100. 0	91. 3
Colorado	2, 218, 038	2, 249, 830	76, 674	95, 529	177, 711	192, 462	2, 472, 423	2, 537, 821	2, 803, 545	2, 946, 095	89. 7	88. 6	3. 1	3. 8	7. 2	7. 6
Illinois	24, 269, 159	23, 313, 257	2, 538, 950	4, 770, 353	----	----	26, 808, 109	28, 083, 610	26, 827, 781	28, 104, 512	90. 5	83. 0	9. 5	17. 0	----	----
Indiana	4, 727, 592	4, 955, 455	101, 010	100, 957	----	----	4, 828, 602	5, 056, 412	4, 828, 602	5, 056, 412	97. 9	98. 0	2. 1	2. 0	----	----
Iowa	29, 424	65, 978	----	----	----	----	29, 424	65, 978	72, 714	65, 978	100. 0	100. 0	----	----	----	----
Kentucky	35, 319, 221	37, 074, 600	677, 113	1, 264, 731	1, 945, 178	1, 467, 859	37, 941, 512	39, 807, 190	39, 330, 638	41, 562, 509	93. 1	93. 1	1. 8	3. 2	5. 1	3. 7
Maryland	20, 538	----	----	----	75, 059	123, 740	95, 597	123, 740	95, 597	125, 413	21. 5	----	----	----	78. 5	100. 0
Montana:																
Bituminous	392, 195	349, 955	----	----	----	3, 230	392, 195	353, 185	400, 143	353, 185	100. 0	99. 1	----	----	----	. 9
Lignite	5, 403	3, 200	----	----	----	----	5, 403	3, 200	5, 403	4, 512	100. 0	100. 0	----	----	----	----
Total, Montana	397, 598	353, 155	----	----	----	3, 230	397, 598	356, 385	405, 546	357, 697	100. 0	99. 1	----	----	----	. 9
New Mexico	59, 206	55, 951	----	----	500	950	59, 706	56, 901	67, 011	63, 334	99. 2	98. 3	----	----	. 8	1. 7
North Dakota (lignite)	13, 169	2, 464	----	----	----	----	13, 169	2, 464	15, 265	2, 464	100. 0	100. 0	----	----	----	----
Ohio	9, 474, 593	9, 999, 283	1, 461, 564	2, 007, 835	261, 325	138, 907	11, 197, 482	12, 146, 025	11, 230, 292	12, 208, 237	84. 6	82. 3	13. 1	16. 5	2. 3	1. 2
Oklahoma	37, 195	57, 044	----	----	630, 796	407, 460	667, 991	464, 504	667, 991	464, 504	5. 6	12. 3	----	----	94. 4	87. 7
Pennsylvania	41, 894, 628	39, 060, 296	13, 163, 968	17, 486, 880	3, 476, 673	3, 772, 409	58, 535, 269	60, 319, 585	59, 502, 586	60, 996, 526	71. 6	64. 8	22. 5	29. 0	5. 9	6. 2
Tennessee	1, 725, 576	2, 682, 210	----	24, 713	179, 637	175, 961	1, 905, 213	2, 882, 884	1, 905, 213	2, 889, 584	90. 6	93. 0	----	. 9	9. 4	6. 1
Utah	5, 722, 492	5, 910, 519	530, 947	583, 069	9, 404	17, 566	6, 262, 843	6, 511, 154	6, 262, 843	6, 511, 154	91. 4	90. 8	8. 5	8. 9	. 1	. 3
Virginia	12, 121, 480	12, 720, 823	982, 308	957, 215	321, 737	208, 092	13, 425, 525	13, 886, 130	14, 114, 202	14, 967, 370	90. 3	91. 6	7. 3	6. 9	2. 4	1. 5
Washington	131, 972	98, 358	260, 870	230, 211	149, 278	82, 530	542, 120	411, 099	542, 616	413, 254	24. 4	23. 9	48. 1	56. 0	27. 5	20. 1
West Virginia	100, 522, 243	105, 143, 239	6, 268, 530	11, 138, 312	7, 174, 213	7, 681, 591	113, 964, 986	123, 963, 142	118, 018, 257	128, 035, 949	88. 2	84. 8	5. 5	9. 0	6. 3	6. 2
Wyoming	1, 226, 264	894, 526	71, 282	46, 188	73, 908	75, 935	1, 371, 454	1, 016, 649	1, 378, 115	1, 020, 099	89. 4	88. 0	5. 2	4. 5	5. 4	7. 5
Total	247, 714, 091	252, 224, 121	27, 460, 204	39, 906, 323	15, 497, 019	15, 271, 104	290, 671, 314	307, 401, 548	298, 506, 679	315, 698, 648	85. 2	82. 0	9. 5	13. 0	5. 3	5. 0

[1] Includes mobile loading machines, scrapers, and conveyors equipped with Duckbills or other self-loading heads.

TABLE 35.—Number of underground bituminous-coal and lignite mines using mechanical loading devices and number of units in use in the United States, 1955–56, by States

State	Number of mines										Number of loading devices									
	Using loading machines only [1]		Using continuous-mining machines only		Using hand-loaded conveyors only		Using more than one type of mechanical loading		Total		Loading machines: Mobile loading machines		Loading machines: Scrapers		Loading machines: Duckbills or other self-loading conveyors		Continuous-mining machines		Hand-loaded conveyors (number of units)	
	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956
Alabama	18	15			10	9	5	5	33	29	117	115			4	5	11	10	70	79
Alaska	2	2					2	2	4	4	5	6	2	13		5	2	2	6	6
Arkansas					9	7		1	9	8								1	47	25
Colorado	33	36	1	1	15	17	7	8	56	62	40	47	1	6	124	109	5	5	59	48
Illinois	56	51	1	2			2	5	59	58	215	200			8	8	27	35		
Indiana	24	23					1	1	25	24	86	70					3	3		
Iowa	3	3							3	3	3	4								
Kentucky	126	133	3	2	20	25	13	13	162	173	512	532			28	10	15	16	192	169
Maryland	1				5	6	1		7	6	1				1				10	15
Montana:																				
Bituminous	8	8				1			8	9	15	16			6	6				1
Lignite	1	1							1	1	2	2								
Total Montana	9	9				1			9	10	17	18			6	6				1
New Mexico	1	1			1	1			2	2	2	2							1	1
North Dakota (lignite)	2	1							2	1	2	1								
Ohio	25	28	3	3	15	19	5	4	48	54	137	141			7	6	16	23	39	31
Oklahoma	1				4	4	1	1	6	5	6	5							102	80
Pennsylvania	80	84	7	8	79	113	48	61	214	266	853	843	5	3	74	91	182	248	397	461
Tennessee	10	15			5	5		1	15	21	23	44			12	16		1	27	25
Utah	31	32		1	2	1	2	7	35	41	116	131	1		4	7	9	12	2	7
Virginia	31	59	1		7	6	7	5	46	70	193	187			8	7	9	11	37	26
Washington	3	3			1		2	2	6	5	4	4	8	7	2		5	6	85	32
West Virginia	240	243	4	6	79	74	54	65	377	388	1,457	1,471			111	75	99	135	832	792
Wyoming	6	8	1	1		1	3	2	10	12	30	33	6	6	98	92	2	2	19	21
Total	702	746	21	24	252	289	153	183	1,128	1,242	3,819	3,854	23	35	487	437	385	510	1,925	1,819

[1] Includes mobile loading machines, scrapers, and conveyors equipped with Duckbills or other self-loading heads.

TABLE 36.—Underground production at bituminous-coal and lignite mines in the United States, 1955–56, by States and methods of loading

State	Hand-loaded (net tons)		Mechanically loaded (net tons)		Total underground production (net tons)		Underground output hand-loaded (percent)		Underground output mechanically loaded (percent)	
	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956
Alabama	1, 171, 622	1, 152, 429	9, 798, 988	9, 245, 395	10, 970, 610	10, 397, 824	10. 7	11. 1	89. 3	88. 9
Alaska	174, 108	123, 640	65, 463	140, 366	239, 571	264, 006	72. 7	46. 8	27. 3	53. 2
Arizona	8, 898	10, 060	----------	----------	8, 898	10, 060	100. 0	100. 0	----------	----------
Arkansas	29, 161	11, 468	287, 840	324, 114	317, 001	335, 582	9. 2	3. 4	90. 8	96. 6
Colorado	738, 702	606, 023	2, 472, 423	2, 537, 821	3, 211, 125	3, 143, 844	23. 0	19. 3	77. 0	80. 7
Georgia	12, 471	6, 177	----------	----------	12, 471	6, 177	100. 0	100. 0	----------	----------
Illinois	448, 386	343, 095	26, 808, 109	28, 083, 610	27, 256, 495	28, 426, 705	1. 6	1. 2	98. 4	98. 8
Indiana	138, 487	118, 625	4, 828, 602	5, 056, 412	4, 967, 089	5, 175, 037	2. 8	2. 3	97. 2	97. 7
Iowa	268, 066	207, 743	29, 424	65, 978	297, 490	273, 721	90. 1	75. 9	9. 9	24. 1
Kansas	14, 819	13, 023	----------	----------	14, 819	13, 023	100. 0	100. 0	----------	----------
Kentucky	16, 498, 632	17, 180, 159	37, 941, 512	39, 807, 190	54, 440, 144	56, 987, 349	30. 3	30. 1	69. 7	69. 9
Maryland	179, 857	215, 051	95, 597	123, 740	275, 454	338, 791	65. 3	63. 5	34. 7	36. 5
Missouri	157, 103	139, 948	----------	----------	157, 103	139, 948	100. 0	100. 0	----------	----------
Montana:										
Bituminous	23, 143	25, 414	392, 195	353, 185	415, 338	378, 599	5. 6	6. 7	94. 4	93. 3
Lignite	18, 544	14, 271	5, 403	3, 200	23, 947	17, 471	77. 4	81. 7	22. 6	18. 3
Total Montana	41, 687	39, 685	397, 598	356, 385	439, 285	396, 070	9. 5	10. 0	90. 5	90. 0
New Mexico	114, 593	89, 867	59, 706	56, 901	174, 299	146, 768	65. 7	61. 2	34. 3	38. 8
North Dakota (lignite)	8, 188	6, 548	13, 169	2, 464	21, 357	9, 012	38. 3	72. 7	61. 7	27. 3
Ohio	1, 434, 683	1, 277, 746	11, 197, 482	12, 146, 025	12, 632, 165	13, 423, 771	11. 4	9. 5	88. 6	90. 5
Oklahoma	26, 332	26, 629	667, 991	464, 504	694, 323	491, 133	3. 8	5. 4	96. 2	94. 6
Pennsylvania	6, 368, 962	6, 168, 977	58, 535, 269	60, 319, 585	64, 904, 231	66, 488, 562	9. 8	9. 3	90. 2	90. 7
Tennessee	3, 435, 451	3, 672, 224	1, 905, 213	2, 882, 884	5, 340, 664	6, 555, 108	64. 3	56. 0	35. 7	44. 0
Utah	32, 681	11, 010	6, 262, 843	6, 511, 154	6, 295, 524	6, 522, 164	. 5	. 2	99. 5	99. 8
Virginia	8, 815, 737	11, 602, 636	13, 425, 525	13, 886, 130	22, 241, 262	25, 488, 766	39. 6	45. 5	60. 4	54. 5
Washington	35, 956	31, 108	542, 120	411, 099	578, 076	442, 207	6. 2	7. 0	93. 8	93. 0
West Virginia	12, 623, 276	15, 309, 508	113, 964, 986	123, 963, 142	126, 588, 262	139, 272, 650	10. 0	11. 0	90. 0	89. 0
Wyoming	16, 067	9, 116	1, 371, 454	1, 016, 649	1, 387, 521	1, 025, 765	1. 2	. 9	98. 8	99. 1
Total	52, 793, 925	58, 372, 495	290, 671, 314	307, 401, 548	343, 465, 239	365, 774, 043	15. 4	16. 0	84. 6	84. 0

TABLE 37.—Units of mechanical loading equipment sold to bituminous-coal and lignite mines for underground use in the United States, as reported by manufacturers, 1948–56

Type of equipment	1948	1949	1950	1951	1952	1953	1954	1955	1956	Change from 1955 (percent)
Mobile loading machines	[1] 723	[1] 286	[1] 289	[1] 287	[1] 206	180	92	120	239	+99.2
Continuous-mining machines	(1)	(1)	(1)	(1)	(1)	67	101	109	154	+41.3
Scrapers	17	8	1	4	8	11	5	-----	-----	-----
Conveyors [2]	1,025	394	316	297	155	87	61	143	232	+62.2
Total	1,765	688	606	588	369	345	259	372	625	+68.0
Number of manufacturers reporting	22	22	20	21	22	25	23	22	23	-----

[1] Continuous-mining machines included with mobile loading machines.
[2] Includes hand-loaded conveyors and those equipped with Duckbills or other self-loading heads.

TABLE 38.—Units of mechanical loading equipment sold for use in bituminous-coal and lignite mines in the United States, as reported by manufacturers, 1955–56, by States

State	Mobile loading machines		Continuous-mining machines		Room conveyors [1]	
	1955	1956	1955	1956	1955	1956
Alabama	2	21	-----	1	4	6
Colorado	-----	1	-----	-----	-----	-----
Illinois	1	1	7	9	-----	-----
Indiana	1	1	-----	1	-----	-----
Kentucky	27	29	6	5	28	32
Ohio	-----	2	4	8	7	5
Oklahoma	-----	-----	-----	-----	-----	5
Pennsylvania	17	41	50	68	12	30
Tennessee	3	-----	-----	1	-----	-----
Utah	3	3	5	2	-----	-----
Virginia	14	14	9	3	17	6
Washington	-----	-----	1	-----	-----	-----
West Virginia	52	125	27	56	75	148
Wyoming	-----	1	-----	-----	-----	-----
Total	120	239	109	154	143	232

[1] Includes hand-loaded conveyors and those equipped with Duckbills or other self-loading heads.

TABLE 39.—Units of conveying equipment sold for use in bituminous-coal and lignite mines in the United States, as reported by manufacturers, 1955–56, by States

State	Bridge conveyors [1]		Shuttle cars		"Mother" conveyors [2]	
	1955	1956	1955	1956	1955	1956
Alabama	(1)	6	17	33	3	7
Colorado	(1)	-----	2	4	-----	1
Illinois	(1)	4	12	9	1	12
Indiana	(1)	-----	3	8	1	1
Kentucky	(1)	30	45	35	8	6
Ohio	(1)	10	-----	10	7	9
Oklahoma	(1)	-----	-----	2	-----	-----
Pennsylvania	(1)	12	96	130	27	36
Tennessee	(1)	-----	2	4	-----	1
Utah	(1)	-----	13	8	2	4
Virginia	(1)	3	31	40	6	7
West Virginia	(1)	63	127	275	23	53
Wyoming	(1)	-----	-----	2	-----	-----
Total	(1)	128	348	560	78	137

[1] Data not available for 1955.
[2] Includes all haulage conveyors with capacity over 500 feet, except main-slope conveyors.

MECHANICAL CLEANING

Mechanical cleaning refers to cleaning raw coal with mechanical devices that separate out impurities, usually by differences in specific gravity, and does not include coal that is screened only. Mechanical devices are divided into two general classes—wet and pneumatic. About 92 percent of the coal cleaned in 1956 was cleaned by various wet methods. Approximately half of all bituminous coal cleaned in the United States is cleaned with jigs. The various types of mechanical cleaning equipment are described in detail in Minerals Yearbook, volume II, Fuels, 1953, pages 94–96.

TABLE 40.—Growth of mechanical cleaning at bituminous-coal and lignite mines in the United States, 1927–56

Year	Total production (thousand tons)	Mechanical cleaning					Percentage of total production mechanically cleaned
		Number of cleaning plants	Raw coal (thousand tons)	Cleaned coal (thousand tons)	Refuse (thousand tons)	Percentage of refuse to raw coal	
1927	517,763	(1)	(1)	27,692	(1)	(1)	5.3
1928	500,745	236	(1)	28,783	(1)	(1)	5.7
1929	534,989	280	40,241	36,799	3,442	8.6	6.9
1930	467,526	297	42,645	38,800	3,845	9.0	8.3
1931	382,089	312	39,529	36,172	3,357	8.5	9.5
1932	309,710	309	32,903	30,278	2,625	8.0	9.8
1933	333,630	290	37,682	34,558	3,124	8.3	10.4
1934	359,368	293	43,556	39,827	3,729	8.6	11.1
1935	372,373	320	49,473	45,361	4,112	8.3	12.2
1936	439,088	342	67,162	61,095	6,067	9.0	13.9
1937	445,531	(1)	(1)	65,000	(1)	(1)	14.6
1938	348,545	374	71,207	63,455	7,752	10.9	18.2
1939	394,855	366	88,895	79,429	9,466	10.6	20.1
1940	460,771	387	115,692	102,270	13,422	11.6	22.2
1941	514,149	417	133,379	117,540	15,839	11.9	22.9
1942	582,693	438	162,598	142,187	20,411	12.6	24.4
1943	590,177	432	167,310	145,576	21,734	13.0	24.7
1944	619,576	439	182,071	158,727	23,344	12.8	25.6
1945	577,617	439	172,899	147,886	25,013	14.5	25.6
1946	533,922	445	163,633	138,670	24,963	15.3	26.0
1947	630,624	461	206,620	174,436	32,184	15.6	27.7
1948	599,518	502	215,217	180,880	34,337	16.0	30.2
1949	437,868	571	184,691	153,652	31,039	16.8	35.1
1950	516,311	612	238,391	198,699	39,692	16.7	38.5
1951	533,665	631	289,838	240,010	49,828	17.2	45.0
1952	466,841	625	274,246	227,265	46,981	17.1	48.7
1953	457,290	611	295,654	241,759	53,895	18.2	52.9
1954	391,706	613	287,004	232,764	54,240	18.9	59.4
1955	464,633	575	335,458	272,715	62,743	18.7	58.7
1956	500,874	583	359,378	292,365	67,013	18.6	58.4

[1] Data not available.

TABLE 41.—Mechanical cleaning at bituminous-coal and lignite mines in the United States, 1956, by States

State	Total production (net tons)	Mechanical cleaning					Percentage of total production mechanically cleaned
		Number of cleaning plants	Raw coal (net tons)	Cleaned coal (net tons)	Refuse (net tons)	Percentage of refuse to raw coal	
Alabama	12,663,344	32	17,436,992	11,306,990	6,130,002	35.2	89.3
Alaska	726,801	4	585,536	341,486	244,050	41.7	47.0
Arkansas	590,091	(1)	(1)	(1)	(1)	(1)	(1)
Colorado	3,502,163	2 4	2 1,557,954	2 1,312,764	2 245,190	2 15.7	2 37.5
Illinois	48,102,041	61	49,507,854	41,396,985	8,110,869	16.4	86.1
Indiana	17,089,433	23	14,341,080	12,310,515	2,030,565	14.2	72.0
Kansas	883,877	3	977,547	611,136	366,411	37.5	69.1
Kentucky	74,555,028	84	49,138,058	41,708,504	7,429,554	15.1	55.9
Missouri	3,282,978	11	4,155,102	3,072,313	1,082,789	26.1	93.6
Montana (bituminous)	820,265	2	13,615	12,315	1,300	9.5	1.5
New Mexico	158,444	1	38,838	32,775	6,063	15.6	20.7
Ohio	38,933,557	26	21,948,415	17,059,794	4,888,621	22.3	43.8
Oklahoma	2,006,987	3	638,821	553,333	85,488	13.4	27.6
Pennsylvania	90,286,692	100	67,983,456	54,845,125	13,138,331	19.3	60.7
Tennessee	8,847,770	4	1,099,014	1,001,992	97,022	8.8	11.3
Utah	6,522,164	4	3,963,186	3,333,135	630,051	15.9	51.1
Virginia	28,062,775	27	14,335,790	12,132,408	2,203,382	15.4	43.2
Washington	472,620	5	773,817	457,956	315,861	40.8	96.9
West Virginia	155,890,449	188	110,868,445	90,862,855	20,005,590	18.0	58.3
Wyoming	2,553,380	1	14,303	13,003	1,300	9.1	.5
Other States 3	4,923,218						
Total	500,874,077	583	359,377,823	292,365,384	67,012,439	18.6	58.4

1 Included in Colorado.
2 Includes Arkansas.
3 Includes Arizona, California lignite, Georgia, Iowa, Maryland, Montana lignite, North Dakota lignite, and South Dakota lignite.

Mechanical cleaning of bituminous coal increased more rapidly at underground mines than at strip mines from 1953 to 1956; the percentage of total production cleaned at underground mines increased about 8 percent during this period, whereas at strip mines the percentage increased only 2 percent. Increased mechanical loading at underground mines was the major reason for the increased proportion of underground coal that required cleaning. The percentage of refuse to raw coal increased less than 1 percent during the 3-year period.

In the following tables on mechanical cleaning, where data are tabulated by States, the tonnage is credited to the State from which the coal was mined. The cleaning plant has been credited to the State where most of the coal was mined.

TABLE 42.—Mechanical cleaning of bituminous coal and lignite in the United States, 1927–56, by types of equipment

Year	Wet methods								Pneumatic methods	Total
	Jigs	Concentrating tables	Classifiers	Launders	Dense-medium processes	Jigs and tables	Other combinations	Total		
	THOUSAND NET TONS OF CLEAN COAL									
1927	18,741	3,200	(1)	[1]1,000	(1)	300	800	24,041	3,651	27,692
1928	17,927	3,412	(1)	[1]2,446	(1)	1,056	156	24,997	3,786	28,783
1929	18,915	3,532	(1)	[1]7,103	(1)	1,214	191	30,955	5,844	36,799
1930	17,724	2,272	(1)	[1]9,818	(1)	1,029	62	30,905	7,895	38,800
1931	13,957	1,551	(1)	[1]11,213	(1)	926	11	27,658	8,514	36,172
1932	9,963	821	(1)	[1]12,140	(1)	806	9	23,739	6,539	30,278
1933	11,895	1,119	(1)	[1]13,272	(1)	693	5	26,984	7,574	34,558
1934	14,012	1,116	(1)	[1]15,168	(1)	1,227	6	31,529	8,298	39,827
1935	15,735	1,118	(1)	[1]18,454	(1)	1,549	---	36,856	8,505	45,361
1936	23,417	1,843	(1)	[1]22,631	(1)	2,613	---	50,504	10,591	61,095
1937	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	65,000
1938	27,615	984	4,521	10,681	4,450	2,791	2,145	53,187	10,268	63,455
1939	37,056	1,402	5,917	12,809	4,683	3,256	2,611	67,734	11,695	79,429
1940	47,064	2,330	7,762	16,269	6,692	2,765	4,408	87,290	14,980	102,270
1941	53,287	2,510	8,177	16,954	9,344	4,364	5,742	100,378	17,162	117,540
1942	66,876	3,138	10,529	18,658	12,495	4,366	5,938	122,000	20,187	142,187
1943	66,092	2,929	11,854	17,424	13,388	4,322	8,366	124,375	21,201	145,576
1944	74,175	2,753	14,780	19,686	13,869	4,649	8,751	138,663	20,064	158,727
1945	68,609	2,594	14,203	18,980	12,875	4,754	8,455	130,470	17,416	147,886
1946	64,702	1,447	13,883	16,021	14,173	3,776	8,057	122,059	16,611	138,670
1947	85,931	2,980	14,648	17,902	17,702	4,303	12,617	156,083	18,353	174,436
1948	87,506	4,360	18,304	16,788	20,638	5,252	11,816	164,664	16,216	180,880
1949	72,423	4,040	14,865	11,238	17,821	3,288	17,033	140,708	12,944	153,652
1950	94,161	4,693	18,059	11,630	28,948	6,153	19,526	183,170	15,529	198,699
1951	101,746	5,811	23,174	10,362	33,840	7,613	38,884	221,430	18,580	240,010
1952	97,336	3,723	19,296	11,738	31,321	8,280	36,925	208,619	18,646	227,265
1953	101,001	4,002	18,312	11,988	36,805	8,647	41,739	222,494	19,265	241,759
1954	99,913	6,606	16,115	12,156	43,104	9,024	27,119	214,037	18,727	232,764
1955	114,538	7,443	17,656	11,400	49,332	13,953	38,098	252,420	20,295	272,715
1956	124,858	9,535	15,064	10,223	56,937	10,978	40,459	268,054	24,311	292,365
	PERCENTAGE CLEANED BY EACH TYPE									
1927	67.6	11.6	(1)	[1]3.6	(1)	1.1	2.9	86.8	13.2	100.0
1928	62.3	11.8	(1)	[1]8.5	(1)	3.7	.5	86.8	13.2	100.0
1929	51.4	9.6	(1)	[1]19.3	(1)	3.3	.5	84.1	15.9	100.0
1930	45.6	5.9	(1)	[1]25.3	(1)	2.7	.2	79.7	20.3	100.0
1931	38.6	4.3	(1)	[1]31.0	(1)	2.6	---	76.5	23.5	100.0
1932	32.8	2.7	(1)	[1]40.2	(1)	2.7	---	78.4	21.6	100.0
1933	34.4	3.2	(1)	[1]38.5	(1)	2.0	---	78.1	21.9	100.0
1934	35.2	2.8	(1)	[1]38.1	(1)	3.1	---	79.2	20.8	100.0
1935	34.7	2.5	(1)	[1]40.7	(1)	3.4	---	81.3	18.7	100.0
1936	38.3	3.0	(1)	[1]37.1	(1)	4.3	---	82.7	17.3	100.0
1937	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	100.0
1938	43.5	1.6	7.1	16.8	7.0	4.4	3.4	83.8	16.2	100.0
1939	46.6	1.8	7.5	16.1	5.9	4.1	3.3	85.3	14.7	100.0
1940	46.0	2.3	7.6	15.9	6.5	2.7	4.3	85.3	14.7	100.0
1941	45.3	2.2	7.0	14.4	7.9	3.7	4.9	85.4	14.6	100.0
1942	47.0	2.2	7.4	13.1	8.8	3.1	4.2	85.8	14.2	100.0
1943	45.4	2.0	8.1	12.0	9.2	3.0	5.7	85.4	14.6	100.0
1944	46.7	1.8	9.3	12.4	8.8	2.9	5.5	87.4	12.6	100.0
1945	46.4	1.8	9.6	12.8	8.7	3.2	5.7	88.2	11.8	100.0
1946	46.7	1.0	10.0	11.6	10.2	2.7	5.8	88.0	12.0	100.0
1947	49.3	1.7	8.4	10.3	10.1	2.5	7.2	89.5	10.5	100.0
1948	48.4	2.4	10.1	9.3	11.4	2.9	6.5	91.0	9.0	100.0
1949	47.1	2.6	9.7	7.3	11.6	2.2	11.1	91.6	8.4	100.0
1950	47.4	2.4	9.1	5.8	14.6	3.1	9.8	92.2	7.8	100.0
1951	42.4	2.4	9.7	4.3	14.1	3.2	16.2	92.3	7.7	100.0
1952	42.8	1.6	8.5	5.2	13.8	3.6	16.3	91.8	8.2	100.0
1953	41.8	1.6	7.6	4.9	15.2	3.6	17.3	92.0	8.0	100.0
1954	42.8	3.0	5.7	3.9	21.8	3.5	14.4	95.1	4.9	100.0
1955	42.0	2.7	6.5	4.2	18.1	5.1	14.0	92.6	7.4	100.0
1956	42.7	3.3	5.1	3.5	19.5	3.8	13.8	91.7	8.3	100.0

[1] Launders include classifiers and dense-medium processes for 1927–36.
[2] Data not available.

TABLE 43.—Mechanical cleaning at bituminous-coal and lignite mines in the United States, 1953–56, by underground, strip, and auger mining

Type of mining	1953	1954	1955	1956
Underground mines:				
Total production net tons	349, 550, 972	289, 112, 031	343, 465, 239	365, 774, 043
Cleaned do	194, 934, 599	184, 372, 053	217, 199, 126	232, 231, 914
Cleaned percent	55. 8	63. 8	63. 2	63. 5
Strip mines:				
Total production net tons	105, 448, 569	98, 134, 250	115, 092, 769	127, 055, 382
Cleaned do	46, 202, 508	47, 772, 295	54, 423, 341	58, 271, 513
Cleaned percent	43. 8	48. 7	47. 3	45. 9
Auger mines:				
Total production net tons	2, 290, 908	4, 460, 019	6, 075, 400	8, 044, 652
Cleaned do	621, 470	619, 675	1, 093, 017	1, 861, 957
Cleaned percent	27. 1	13. 9	18. 0	23. 1
Total, all mines:				
Total production net tons	457, 290, 449	391, 706, 300	464, 633, 408	500, 874, 077
Cleaned do	241, 758, 577	232, 764, 023	272, 715, 484	292, 365, 384
Cleaned percent	52. 9	59. 4	58. 7	58. 4

TABLE 44.—Mechanical cleaning at bituminous-coal and lignite mines in the United States, 1956, by States and by underground, strip, and auger mining

State	Underground mines			Strip mines		
	Total production	Mechanically cleaned	Percentage cleaned	Total production	Mechanically cleaned	Percentage cleaned
Alabama	10, 397, 824	9, 733, 447	93. 6	2, 260, 108	1, 568, 131	69. 4
Alaska	264, 006	88, 531	33. 5	462, 795	252, 955	54. 7
Arkansas	335, 582	(1)	(1)	254, 509	(1)	(1)
Colorado	3, 143, 844	[2] 1, 016, 662	[2] 29. 2	358, 319	[2] 296, 102	[2] 48. 3
Illinois	28, 426, 705	22, 789, 671	80. 2	19, 675, 336	18, 607, 314	94. 6
Indiana	5, 175, 037	4, 061, 752	78. 5	11, 914, 396	8, 248, 763	69. 2
Kansas	13, 023			870, 854	611, 136	70. 2
Kentucky	56, 987, 349	30, 047, 849	52. 7	16, 463, 639	11, 624, 655	70. 6
Missouri	139, 948	43, 965	31. 4	3, 143, 030	3, 028, 348	96. 4
Montana (bituminous)	378, 599	12, 315	3. 3	441, 666		
New Mexico	146, 768	32, 775	22. 3	11, 676		
Ohio	13, 423, 771	9, 212, 615	68. 6	24, 156, 255	7, 624, 272	31. 6
Oklahoma	491, 133	258, 376	52. 6	1, 515, 854	294, 957	19. 5
Pennsylvania	66, 488, 562	51, 077, 789	76. 8	23, 606, 082	3, 759, 981	15. 9
Tennessee	6, 555, 108	937, 276	14. 3	1, 966, 635	48, 716	2. 5
Utah	6, 522, 164	3, 333, 135	51. 1			
Virginia	25, 488, 766	11, 875, 167	46. 6	1, 968, 514	253, 564	12. 9
Washington	442, 207	427, 543	96. 7	30, 413	30, 413	100. 0
West Virginia	139, 272, 650	87, 270, 043	62. 7	12, 159, 700	2, 022, 206	16. 6
Wyoming	1, 025, 765	13, 003	1. 3	1, 527, 615		
Other States [3]	655, 232			4, 267, 986		
Total	365, 774, 043	232, 231, 914	63. 5	127, 055, 382	58, 271, 513	45. 9

See footnotes at end of table.

TABLE 44.—Mechanical cleaning at bituminous-coal and lignite mines in the United States, 1956, by States and by underground, strip, and auger mining—Continued

State	Auger mines			Total, all mines		
	Total production	Mechanically cleaned	Percentage cleaned	Total production	Mechanically cleaned	Percentage cleaned
Alabama	5,412	5,412	100.0	12,663,344	11,306,990	89.3
Alaska				726,801	341,486	47.0
Arkansas				590,091	(1)	(1)
Colorado				3,502,163	[2] 1,312,764	[2] 37.5
Illinois				48,102,041	41,396,985	86.1
Indiana				17,089,433	12,310,515	72.0
Kansas				883,877	611,136	69.1
Kentucky	1,104,040	36,000	3.3	74,555,028	41,708,504	55.9
Missouri				3,282,978	3,072,313	93.6
Montana (bituminous)				820,265	12,315	1.5
New Mexico				158,444	32,775	20.7
Ohio	1,353,531	222,907	16.5	38,933,557	17,059,794	43.8
Oklahoma				2,006,987	553,333	27.6
Pennsylvania	192,048	7,355	3.8	90,286,692	54,845,125	60.7
Tennessee	326,027	16,000	4.9	8,847,770	1,001,992	11.3
Utah				6,522,164	3,333,135	51.1
Virginia	605,495	3,677	.6	28,062,775	12,132,408	43.2
Washington				472,620	457,956	96.9
West Virginia	4,458,099	1,570,606	35.2	155,890,449	90,862,855	58.3
Wyoming				2,553,380	13,003	.5
Other States [3]				4,923,218		
Total	8,044,652	1,861,957	23.1	500,874,077	292,365,384	58.4

[1] Included in Colorado.
[2] Includes Arkansas.
[3] Includes Arizona, California lignite, Georgia, Iowa, Maryland, Montana lignite, North Dakota lignite, and South Dakota lignite.

MECHANICAL CRUSHING

TABLE 45.—Mechanical crushing of bituminous coal and lignite at mines in the United States, 1940 and 1944–56 [1]

Year	Number of mines crushing coal	Coal crushed (net tons)	Percentage of production crushed at mines where crushing is done	Percentage of total production crushed	Percentage of production mechanically cleaned at mines where crushing is done
1940	716	35,251,061	19.3	7.7	(2)
1944	814	66,460,564	29.6	10.8	(2)
1945	830	70,936,898	32.4	12.3	(2)
1946	851	66,663,732	31.8	12.5	39.9
1947	904	88,985,858	35.7	14.1	41.4
1948	995	91,564,311	36.6	15.3	42.1
1949	1,120	77,327,691	39.0	17.7	47.3
1950	1,210	101,594,731	40.1	19.7	50.6
1951	1,374	118,663,712	39.6	22.2	54.8
1952	1,325	108,102,158	40.5	23.2	59.6
1953	1,239	116,493,415	42.5	25.5	62.7
1954	982	122,288,369	51.8	31.2	69.8
1955	1,225	161,470,318	52.8	34.8	68.4
1956	1,370	172,389,802	54.6	34.4	68.0

[1] Data not available for 1941–43. Lignite and Virginia semianthracite mines are not included in 1940–49.
[2] Data not available.

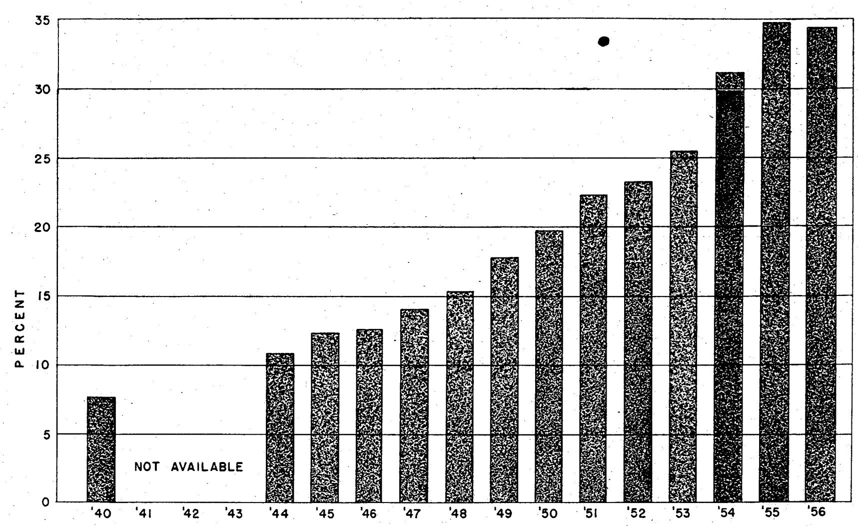

FIGURE 10.—Percentage of total production of bituminous coal and lignite crushed at mines in the United States, 1940 and 1944–56.

TABLE 46.—Mechanical crushing of bituminous coal and lignite at mines in the United States, 1955–56, by States

State	Number of mines crushing coal		Coal crushed (net tons)		Percentage of production crushed at mines where crushing is done		Percentage of total production crushed	
	1955	1956	1955	1956	1955	1956	1955	1956
Alabama	31	34	8, 290, 161	6, 766, 752	79. 4	63. 5	63. 3	53. 4
Alaska	9	6	406, 048	455, 352	63. 9	82. 3	63. 5	62. 7
Arizona	1	1	5, 000	4, 700	84. 8	84. 5	56. 2	46. 7
Arkansas	9	7	406, 347	410, 786	87. 3	89. 4	70. 3	69. 6
California (lignite)		1		12, 000		100. 0		100. 0
Colorado	45	54	1, 849, 272	1, 939, 871	62. 3	65. 3	51. 8	55. 4
Illinois	75	81	19, 154, 389	16, 628, 914	48. 6	39. 7	41. 7	34. 6
Indiana	27	36	6, 337, 377	7, 634, 964	54. 5	49. 6	39. 2	44. 7
Iowa	22	27	539, 700	842, 153	91. 4	80. 5	42. 9	62. 0
Kansas	3	4	610, 648	615, 500	100. 0	97. 7	82. 3	69. 6
Kentucky	132	132	23, 803, 984	22, 165, 595	56. 5	53. 6	34. 5	29. 7
Maryland	12	13	78, 474	192, 912	52. 5	73. 8	15. 3	28. 8
Missouri	11	12	2, 622, 452	1, 739, 304	95. 8	60. 5	81. 1	53. 0
Montana:								
Bituminous	8	7	169, 704	91, 399	14. 4	13. 2	13. 9	11. 1
Lignite	1	2	400	1, 600	7. 4	22. 7	1. 3	6. 2
Total Montana	9	9	170, 104	92, 999	14. 4	13. 3	13. 6	11. 0
New Mexico	3	4	20, 721	62, 932	25. 8	84. 0	10. 3	39. 7
North Dakota (lignite)	19	20	2, 835, 171	2, 548, 245	95. 3	94. 4	91. 4	90. 5
Ohio	133	112	13, 581, 229	12, 186, 813	63. 3	52. 5	35. 9	31. 3
Oklahoma	10	14	697, 149	1, 050, 788	60. 6	81. 7	32. 2	52. 4
Pennsylvania	297	376	32, 620, 925	36, 926, 200	58. 6	64. 8	38. 1	40. 9
South Dakota (lignite)	1	1	1, 000	1, 000	4. 2	4. 1	3. 9	4. 1
Tennessee	13	20	469, 218	1, 202, 457	41. 3	64. 7	6. 7	13. 6
Utah	33	36	5, 004, 664	3, 975, 914	87. 6	69. 5	75. 9	61. 0
Virginia	44	51	2, 994, 166	4, 439, 711	31. 4	43. 5	12. 7	15. 8
Washington	6	4	175, 979	125, 482	35. 9	34. 4	28. 9	26. 6
West Virginia	269	301	37, 231, 652	48, 748, 703	40. 3	52. 8	26. 8	31. 3
Wyoming	11	14	1, 564, 488	1, 619, 755	73. 4	79. 6	53. 5	63. 4
Total	1, 225	1, 370	161, 470, 318	172, 389, 802	52. 8	54. 6	34. 8	34. 4

TREATMENT FOR ALLAYING DUST

TABLE 47.—Summary data on treatment of bituminous coal and lignite at mines for allaying dust in the United States, 1940–56 [1]

Year	Grand total production (net tons)	Total production at mines where coal was treated (net tons)	Percentage of production treated at mines where treating is done	Percentage of total production treated
1940	460,771,500	161,089,959	22.1	7.7
1941	514,149,245	197,476,343	20.0	7.7
1942	582,692,937	202,973,885	17.3	6.0
1943	590,177,069	153,863,052	17.3	4.5
1944	619,576,240	172,955,108	17.8	5.0
1945	577,617,327	166,935,955	20.1	5.8
1946	533,922,068	166,814,848	22.2	6.9
1947	630,623,722	195,840,059	26.4	8.2
1948	599,518,229	196,600,489	25.6	8.4
1949	437,868,036	160,978,742	26.0	9.5
1950	516,311,053	210,083,657	25.9	10.5
1951	533,664,732	228,802,637	25.6	11.0
1952	466,840,782	211,437,141	24.4	11.0
1953	457,290,449	206,374,498	23.7	10.7
1954	391,706,300	202,098,539	27.9	14.4
1955	464,633,408	236,115,318	26.5	13.5
1956	500,874,077	243,513,231	26.6	12.9

Year	Net tons treated with—				
	Calcium chloride	Oil	Calcium chloride and oil	All other materials	Total
1940	2,633,291	25,767,651	4,428,113	2,807,728	35,636,783
1941	3,957,459	29,258,462	2,482,899	3,844,476	39,543,296
1942	10,132,809	11,302,020	6,544,658	7,148,064	35,127,551
1943	15,049,176	1,720,176	1,947,219	7,966,484	26,863,055
1944	7,276,702	13,188,883	4,744,580	5,562,565	30,772,730
1945	5,115,090	18,875,674	4,647,872	4,910,602	33,549,238
1946	4,957,622	24,310,109	3,193,070	4,572,360	37,033,161
1947	5,822,483	34,667,571	5,571,953	5,732,101	51,794,108
1948	6,275,121	34,466,534	4,177,987	5,462,054	50,381,696
1949	3,670,120	30,448,670	4,380,961	3,275,151	41,774,902
1950	4,643,186	41,688,159	4,278,212	3,724,314	54,333,871
1951	4,694,938	46,142,726	4,587,940	3,172,205	58,597,809
1952	4,954,080	41,409,886	3,432,199	1,772,111	51,568,276
1953	3,362,552	40,671,431	2,769,833	2,154,985	48,958,801
1954	2,959,979	47,782,165	3,366,955	2,255,872	56,364,971
1955	3,160,729	51,157,769	5,696,447	2,513,752	62,528,697
1956	5,500,522	52,008,545	4,912,374	2,309,732	64,731,173

Year	Number of mines treating with—				
	Calcium chloride	Oil	Calcium chloride and oil	All other materials	Total [2]
1940	51	486	22	62	614
1941	67	564	15	58	668
1942	167	334	73	117	603
1943	212	67	28	101	393
1944	145	192	47	83	434
1945	105	296	43	67	487
1946	79	380	41	51	546
1947	67	384	58	45	546
1948	68	474	48	46	629
1949	91	586	62	34	769
1950	106	688	32	45	838
1951	98	764	40	27	898
1952	101	723	30	20	865
1953	81	681	28	26	785
1954	83	614	29	29	737
1955	63	650	33	28	757
1956	73	635	35	20	763

Year	Percentage of tonnage treated with—				
	Calcium chloride	Oil	Calcium chloride and oil	All other materials	Total
1940	7.4	72.3	12.4	7.9	100.0
1941	10.0	74.0	6.3	9.7	100.0
1942	28.8	32.2	18.6	20.4	100.0
1943	56.4	6.4	7.3	29.9	100.0
1944	23.6	42.9	15.4	18.1	100.0
1945	15.2	56.3	13.9	14.6	100.0
1946	13.4	65.6	8.6	12.4	100.0
1947	11.2	66.9	10.8	11.1	100.0
1948	12.5	68.4	8.3	10.8	100.0
1949	8.8	72.9	10.5	7.8	100.0
1950	8.5	76.7	7.9	6.9	100.0
1951	8.0	78.8	7.8	5.4	100.0
1952	9.6	80.3	6.7	3.4	100.0
1953	6.8	83.1	5.7	4.4	100.0
1954	5.2	84.8	6.0	4.0	100.0
1955	5.1	81.8	9.1	4.0	100.0
1956	8.5	80.3	7.6	3.6	100.0

[1] All items except "Grand total production" exclude lignite and semianthracite, 1940–49. Data for 1940–45 include all mines with an average daily production of 50 tons and all mines with rail or river connections regardless of size. Data for 1946–56 include all mines producing 1,000 or more tons. The figures are reasonably comparable for all years.

[2] Because some mines used more than 1 method of treatment, this total is not the sum of the individual items.

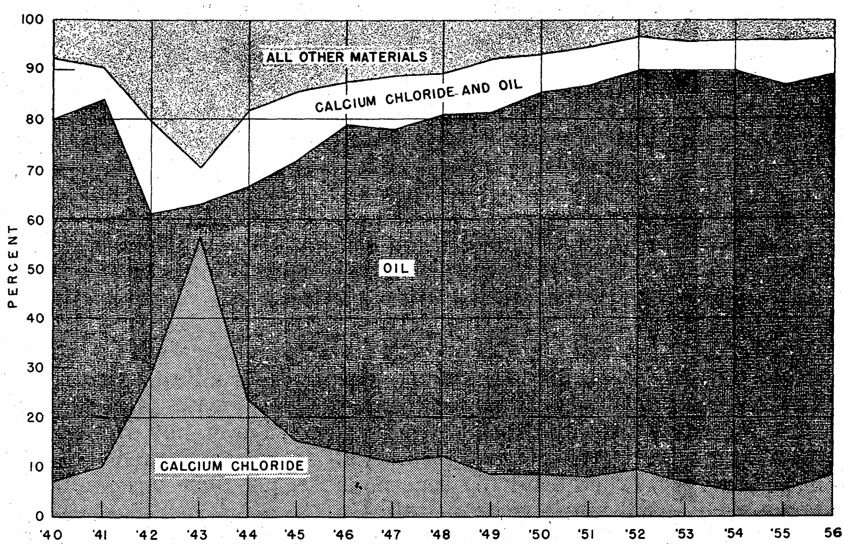

FIGURE 11.—Percentage of total bituminous coal and lignite treated for allaying dust at mines in the United States, 1940–56, by type of agent used.

TABLE 48.—Treatment of bituminous coal and lignite at mines for allaying dust, in the United States, 1955–56, by States

State	Number of mines treating coal		Coal treated (net tons)		Percentage of production treated at mines where treating is done		Percentage of total production treated	
	1955	1956	1955	1956	1955	1956	1955	1956
Alabama	6	5	70, 572	59, 684	14. 1	10. 4	0. 5	0. 5
Arkansas	4	4	33, 500	20, 176	19. 2	12. 3	5. 8	3. 4
Colorado	43	47	302, 051	281, 466	21. 4	19. 5	8. 5	8. 0
Illinois	80	79	5, 544, 987	6, 459, 444	13. 5	15. 0	12. 1	13. 4
Indiana	28	31	1, 639, 142	1, 747, 927	16. 5	15. 5	10. 1	10. 2
Iowa	3	4	10, 300	15, 300	19. 7	12. 2	. 8	1. 1
Kansas	2	1	48, 668	49, 600	10. 0	10. 0	6. 6	5. 6
Kentucky	142	129	14, 824, 593	16, 546, 059	37. 0	40. 0	21. 5	22. 2
Maryland		3		36, 800		66. 7		5. 5
Missouri	10	9	203, 974	175, 157	7. 4	7. 2	6. 3	5. 3
Montana:								
Bituminous	8	8	39, 003	29, 848	9. 9	8. 7	3. 2	3. 6
Lignite	1	2	1, 800	2, 500	33. 3	35. 5	5. 9	9. 7
Total Montana	9	10	40, 803	32, 348	10. 3	9. 2	3. 3	3. 8
North Dakota (lignite)	15	16	518, 517	500, 286	18. 3	19. 4	16. 7	17. 8
Ohio	33	29	2, 818, 862	4, 158, 299	22. 0	23. 7	7. 4	10. 7
Oklahoma	7	6	154, 462	112, 803	16. 8	15. 4	7. 1	5. 6
Pennsylvania	96	140	7, 642, 068	8, 640, 162	30. 4	30. 2	8. 9	9. 6
Tennessee	6	4	183, 324	113, 484	32. 5	9. 9	2. 6	1. 3
Utah	31	32	2, 173, 952	2, 116, 309	54. 5	51. 6	34. 5	32. 4
Virginia	34	28	3, 593, 208	3, 306, 717	30. 2	28. 5	15. 8	11. 8
West Virginia	192	168	22, 419, 396	20, 070, 131	28. 4	27. 3	16. 1	12. 9
Wyoming	16	18	306, 318	289, 021	13. 7	11. 6	10. 5	11. 3
Total	757	763	62, 528, 697	64, 731, 173	26. 5	26. 6	13. 5	12. 9

PRODUCTION BY STATES AND COUNTIES

Detailed production and employment statistics are given in table 49 for each coal-producing county in the United States from which three or more operators submitted reports for 1956. Statistics on counties with less than three reporting producers have been combined with data for "Other counties" to avoid disclosing individual figures, unless the operators have granted the Bureau permission to publish statistics separately. Production of mines on the border between two States has been credited to the State in which the coal was mined rather than to the State in which the tipple was located. If the coal was mined in both States, the tonnage was apportioned accordingly.

Bituminous coal and lignite were mined in 26 States and Alaska and 344 counties in 1956. As soft coal accounts for a large percentage of the economic activity in many counties, the key items pertaining to the industry are published by counties. These key items—(1) method of shipping the coal, (2) value, (3) number of men working daily, (4) days worked, and (5) tons per man per day—are useful in analyzing potential markets by counties.

The most striking fact brought out by the following table is the wide variations among several counties in the same State, not only in production, but even in average value and average tons per man per day. The differences in average value are due to quality of coal, method of transportation, or market conditions. The differences in output per man per day are caused largely by physical conditions, mining methods, and extent of mechanization.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
ALABAMA									
Bibb	88,048			88,048	$4.54	100	222	22,291	3.95
Blount	157,889	66,511		224,400	6.02	109	163	17,763	12.63
Cullman	27,310	13,225		40,535	6.12	46	100	4,581	8.85
De Kalb	53,379	1,516		54,895	5.22	25	193	4,811	11.41
Jackson		19,104		19,104	5.71	19	203	3,859	4.95
Jefferson	8,326,914	184,268	20,533	8,531,715	6.36	5,938	213	1,267,298	6.73
Marion	127,383	251,702		379,085	4.10	500	154	76,812	4.94
St. Clair		3,000		3,000	6.00	3	134	402	7.46
Shelby	17,983	68,396		86,379	6.58	176	186	32,719	2.64
Tuscaloosa	649,143	35,284	1,230	685,657	4.49	231	199	45,875	14.95
Walker	846,338	177,517	1,508,533	2,532,388	6.86	1,281	202	258,326	9.80
Winston		18,138		18,138	5.11	11	168	1,847	9.82
Total Alabama	10,294,387	838,661	1,530,296	12,663,344	6.26	8,439	206	1,736,584	7.29

For footnotes, see end of table.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties—Continued

County	Production (net tons): Shipped by rail or water [1]	Production (net tons): Shipped by truck	Production (net tons): Used at mine [2]	Production (net tons): Total	Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
ALASKA									
Total Alaska	708,360	13,464	4,977	726,801	$8.77	316	245	77,509	9.38
ARIZONA									
Navajo		10,060		10,060	$6.56	21	176	3,703	2.72
ARKANSAS									
Franklin	6,873			6,873	$4.36	4	248	992	6.93
Johnson	249,898	42	3	249,943	7.68	147	158	23,242	10.75
Logan	23,903	1,320		25,223	8.00	114	64	7,269	3.47
Sebastian	298,438	9,614		308,052	7.95	399	194	77,232	3.99
Total Arkansas	579,112	10,976	3	590,091	7.80	664	164	108,735	5.43
CALIFORNIA (LIGNITE)									
Amador			12,000	12,000	$10.00	3	178	535	22.43
COLORADO									
Boulder		5,419		5,419	$6.59	12	93	1,110	4.88
Delta	32,229	24,800	1,037	58,066	5.63	50	185	9,261	6.27
El Paso	8,841	37,140	1,191	47,172	4.77	23	249	5,723	8.24
Fremont	4,221	236,241	60	240,522	3.73	130	211	27,479	8.75
Garfield		24,096		24,096	6.03	34	202	6,788	3.55
Gunnison	229,347	51,567	22,054	302,968	5.51	229	183	42,079	7.20
Huerfano	22,085	39,727	80	61,892	5.83	71	174	12,280	5.04
Jackson		2,051		2,051	3.97	3	219	657	3.12
La Plata	26,052	25,381	14	51,447	4.21	41	207	8,518	6.04
Las Animas	1,200,966	24,270	7,680	1,232,916	7.11	1,446	209	302,171	4.08
Mesa	41,984	28,047	329	70,360	5.36	62	171	10,580	6.65
Moffat	87,931	8,529		96,460	5.59	38	174	6,611	14.59
Montrose		2,707		2,707	6.54	3	283	849	3.19
Pitkin	153,979			153,979	7.19	93	239	22,251	6.92
Rio Blanco	4,000	14,630		18,630	5.53	12	172	2,068	9.01
Routt	451,638	34,607	3,693	489,938	4.37	251	146	36,645	13.37
Weld	395,642	239,654	8,244	643,540	4.50	304	203	61,760	10.42
Total Colorado	2,658,915	798,866	44,382	3,502,163	5.66	2,802	199	556,830	6.29
GEORGIA									
Walker		8,471		8,471	$5.00	16	123	1,975	4.29

For footnotes, see end of table.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
ILLINOIS									
Bureau	740,237	20,564	4,597	765,398	$4.24	119	274	32,681	23.42
Christian	5,495,306	217,405	12,357	5,725,068	3.42	1,286	220	282,361	20.28
Clinton	50,414	98,726	13,451	162,591	3.92	195	186	36,293	4.48
Douglas	208,508	177,157	1,250	386,915	4.33	81	255	20,624	18.76
Franklin	4,553,591	122,659	68,827	4,745,077	4.26	1,630	205	334,160	14.20
Fulton	5,123,748	229,536	9,792	5,363,076	3.86	856	242	207,133	25.89
Gallatin	202,198	24,059	290	226,547	2.98	102	214	21,848	10.37
Greene	----------	5,103	5	5,108	5.09	2	240	480	10.63
Grundy	154,011	63,980	----------	217,991	4.86	51	224	11,510	18.94
Hancock	----------	28,581	110	28,691	6.36	10	187	1,874	15.31
Henry	66,562	21,523	767	88,852	4.50	50	229	11,465	7.75
Jackson	1,160,307	92,262	2,755	1,255,324	3.61	316	229	72,236	17.38
Jefferson	2,591,203	60,394	2,582	2,654,179	4.08	623	246	153,281	17.32
Johnson	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Kankakee	438,797	182,290	----------	621,087	4.86	146	224	32,792	18.94
Knox	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
La Salle	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Livingston	----------	2,595	----------	2,595	8.76	4	66	249	10.44
Logan	----------	12,297	1,305	13,602	6.61	28	92	2,538	5.36
Macoupin	264,590	52,976	10,399	327,965	3.92	239	210	50,224	6.53
Madison	329,474	721,500	24,869	1,075,843	3.86	570	189	107,692	9.99
Marion	5,070	3,239	741	9,050	3.72	8	204	1,596	5.67
Menard	----------	14,660	55	14,715	6.26	23	148	3,403	4.32
Montgomery	1,398,163	275,405	4,975	1,678,543	4.26	537	181	97,396	17.23
Peoria	110,278	313,822	978	425,078	4.30	122	186	22,671	18.75
Perry	4,704,380	146,353	10,445	4,861,178	3.62	851	240	204,053	23.82
Randolph	985,204	62,886	246	1,048,336	3.67	342	128	43,783	23.94
St. Clair	1,969,439	1,978,108	23,604	3,971,151	3.39	686	268	183,792	21.61
Saline	2,995,660	27,635	6,612	3,029,907	3.75	1,051	175	183,741	16.49
Sangamon	----------	108,905	300	109,205	3.20	71	163	11,630	9.39
Schuyler	----------	19,845	10	19,855	5.49	30	138	4,141	4.79
Tazewell	----------	3,000	100	3,100	5.07	9	65	585	5.30
Vermilion	855,843	138,937	113	994,893	4.24	173	244	42,125	23.62
Washington	7,829	16,666	820	25,315	4.73	46	137	6,282	4.03
Will	92,443	62,711	----------	155,154	5.50	43	231	9,997	15.52
Williamson	6,126,898	293,823	10,239	6,430,960	3.86	1,673	209	349,515	18.40
Other counties	1,641,806	3,350	14,536	1,659,692	3.90	344	226	77,617	21.38
Total Illinois	42,271,959	5,602,952	227,130	48,102,041	3.84	12,317	213	2,621,768	18.35
INDIANA									
Clay	586,770	262,413	----------	849,183	$3.84	177	251	44,413	19.12
Daviess	----------	69,825	----------	69,825	4.33	50	223	11,208	6.23
Dubois	----------	34,777	----------	34,777	2.70	18	244	4,464	7.79
Fountain	----------	45,894	----------	45,894	6.31	28	149	4,165	11.02
Gibson	633,452	42,065	18,751	694,268	4.26	412	175	71,970	9.65
Greene	1,358,752	93,776	5,290	1,457,818	4.00	271	182	49,303	29.57
Knox	1,117,505	165,643	2,326	1,285,474	3.80	465	192	89,463	14.37
Martin	----------	10,075	----------	10,075	4.14	6	164	957	10.53
Owen	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Parke	----------	20,594	55	20,649	5.98	14	177	2,552	8.09
Pike	2,384,031	83,330	2,608	2,469,969	3.57	515	255	131,148	18.83
Spencer	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Sullivan	770,123	174,838	2,638	947,599	4.00	282	189	53,361	17.76
Vermillion	228,622	43,771		272,393	4.00	87	196	17,059	15.97
Vigo	2,400,531	80,305	604,370	3,085,206	3.92	908	236	214,064	14.41
Warrick	5,191,813	413,387	2,857	5,608,057	3.48	732	223	162,915	34.42
Other counties	154,219	83,768	259	238,246	4.24	92	202	18,602	12.81
Total Indiana	14,825,818	1,624,461	639,154	17,089,433	3.75	4,057	216	875,644	19.52

For footnotes, see end of table.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
IOWA									
Appanoose	47,122	61,971	213	109,306	$4.78	253	151	38,272	2.86
Davis	28,867	25,415	10	54,292	3.36	22	192	4,224	12.85
Lucas	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Mahaska	95,287	49,615	242	145,144	3.44	47	229	10,775	13.47
Marion	576,509	203,959	20	780,488	3.25	175	254	44,537	17.52
Monroe	59,321	63,310	18	122,649	3.30	83	178	14,814	8.28
Polk	----------	9,886	----------	9,886	3.50	4	290	1,160	8.52
Van Buren	----------	25,956	15	25,971	5.12	18	182	3,360	7.73
Wapello	9,104	93,194	----------	102,298	3.74	35	223	7,803	13.11
Warren	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Other counties	----------	8,216	----------	8,216	4.00	10	225	2,252	3.65
Total Iowa	816,210	541,522	518	1,358,250	3.48	647	197	127,197	10.68
KANSAS									
Bourbon	----------	5,496	----------	5,496	$3.53	5	146	736	7.47
Cherokee	467,574	84,965	267	552,806	4.22	116	284	32,905	16.80
Coffey	----------	2,424	----------	2,424	6.00	6	126	755	3.21
Crawford	290,845	26,643	----------	317,488	4.56	121	241	29,104	10.91
Osage	----------	5,663	----------	5,663	7.18	19	149	2,840	1.99
Total Kansas	758,419	125,191	267	883,877	4.36	267	248	66,340	13.32
KENTUCKY									
Eastern Kentucky:									
Bell	987,758	174,839	2,414	1,165,011	$4.95	1,128	145	163,318	7.13
Boyd	179,050	64,915	----------	243,965	4.77	135	271	36,652	6.66
Breathitt	646,819	23,365	765	670,949	5.63	403	213	85,646	7.83
Carter	62,460	64,990	66	127,516	4.93	98	192	18,852	6.76
Clay	983,437	318,977	----------	1,302,414	4.01	1,080	208	224,368	5.80
Clinton	----------	34,057	40	34,097	4.09	60	167	9,999	3.41
Elliott	6,000	8,575	----------	14,575	3.44	16	163	2,548	5.72
Floyd	5,066,335	73,246	2,781	5,142,362	5.56	3,562	192	683,718	7.52
Harlan	8,520,342	81,355	41,718	8,643,415	6.02	5,960	201	1,198,528	7.21
Jackson	----------	137,449	250	137,699	4.41	183	202	36,948	3.73
Johnson	480,513	28,261	----------	508,774	3.77	605	126	76,278	6.67
Knott	663,706	374,918	----------	1,038,624	3.82	712	137	97,733	10.63
Knox	275,183	72,921	1,000	349,104	3.88	343	131	44,907	7.77
Laurel	136,715	42,855	----------	179,570	3.57	124	190	23,592	7.61
Lawrence	----------	25,075	----------	25,075	5.36	29	146	4,279	5.86
Lee	20,000	65,415	----------	85,415	4.82	108	211	22,717	3.76
Leslie	2,372,045	405,249	3,083	2,780,377	4.24	1,930	176	339,240	8.20
Letcher	5,022,792	1,106,859	4,146	6,133,797	5.35	3,634	181	656,741	9.34
McCreary	516,159	97,113	----------	613,272	3.80	274	243	66,559	9.21
Magoffin	----------	3,900	----------	3,900	4.81	9	100	867	4.50
Martin	43,641	1,365	----------	45,006	3.07	122	92	11,252	4.00
Morgan	----------	93,065	15	93,080	4.39	152	70	10,594	8.79
Owsley	----------	13,850	----------	13,850	4.12	17	200	3,463	4.00
Perry	5,612,855	90,108	10,172	5,713,135	4.79	2,975	200	594,937	9.60
Pike	7,780,045	1,247,546	18,108	9,045,699	5.20	5,502	195	1,070,549	8.45
Pulaski	86,145	262,655	----------	348,800	3.68	196	216	42,295	8.25
Rockcastle	91,950	54,626	----------	146,576	3.82	100	166	16,581	8.84
Wayne	----------	33,870	----------	33,870	4.06	25	174	4,338	7.81
Whitley	270,079	73,135	340	343,554	3.77	395	186	73,439	4.68
Wolfe	----------	7,250	----------	7,250	3.00	14	133	1,923	3.77
Total Eastern Kentucky	39,824,029	5,081,804	84,898	44,990,731	5.15	29,891	188	5,622,861	8.00

For footnotes, see end of table.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
KENTUCKY—Continued									
Western Kentucky:									
Butler		128,872		128,872	$3.62	134	174	23,378	5.51
Daviess	831,637	264,156		1,095,793	3.11	126	230	29,035	37.74
Hancock		2,000		2,000	3.06	2	66	131	15.27
Henderson		281,168	557	281,725	3.02	182	206	37,414	7.53
Hopkins	14,401,463	424,767	676	14,826,906	3.46	3,427	219	751,253	19.74
Muhlenberg	6,776,064	154,594	4,199	6,934,857	3.19	1,811	203	367,128	18.89
Ohio	2,761,101	48,498	1,071	2,810,670	3.18	371	247	91,482	30.72
Union	2,222,372	38,759	5,580	2,266,711	3.90	912	221	201,485	11.25
Webster	1,175,563	41,200		1,216,763	3.09	183	220	40,292	30.20
Total Western Kentucky	28,168,200	1,384,014	12,083	29,564,297	3.37	7,148	216	1,541,598	19.18
Total Kentucky	67,992,229	6,465,818	96,981	74,555,028	4.44	37,039	193	7,164,459	10.41
MARYLAND									
Allegany	34,763	196,337		231,100	$3.73	235	153	35,903	6.44
Garrett	299,916	137,859		437,775	4.16	370	185	68,304	6.41
Total Maryland	334,679	334,196		668,875	4.01	605	172	104,207	6.42
MISSOURI									
Adair		47,554	700	48,254	$4.74	94	131	12,278	3.93
Barton	177,867	61,296	635	239,798	4.41	82	271	22,306	10.75
Bates	663,090	8,302		671,392	3.82	123	230	28,293	23.73
Boone		5,295	60	5,355	5.15	6	169	1,028	5.21
Callaway		138,010		138,010	4.72	42	299	12,581	10.97
Clay		5,600	195	5,795	8.70	30	110	3,293	1.76
Dade		15,713		15,713	4.50	9	285	2,563	6.13
Harrison		3,214		3,214	7.00	11	286	3,151	1.02
Henry	899,026	47,139		946,165	3.88	191	257	48,973	19.32
Lafayette		15,046		15,046	6.70	50	136	6,839	2.20
Macon	375,306	12,572		387,878	4.04	62	234	14,620	26.53
Putnam	21,756	9,850		31,606	4.30	51	122	6,229	5.07
Ralls		4,695		4,695	5.50	6	150	899	5.22
Randolph	292,587	67,435		360,022	4.14	131	221	28,957	12.43
St. Clair	322,219	1,316	244	323,779	3.91	59	299	17,511	18.49
Vernon	69,810	16,446		86,256	3.37	29	222	6,413	13.45
Total Missouri	2,821,661	459,483	1,834	3,282,978	4.03	976	221	215,934	15.20

For footnotes, see end of table.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
MONTANA									
Bituminous coal:									
Blaine		5,710	120	5,830	$7.83	7	300	2,097	2.78
Carbon	5,756	11,153	116	17,025	7.24	30	162	4,921	3.46
Cascade		3,198		3,198	6.16	6	151	941	3.40
Hill		1,210	20	1,230	10.00	3	180	539	2.28
Musselshell	306,578	41,661	3,077	351,316	4.99	264	159	41,923	8.38
Rosebud	437,514	1,500	2,652	441,666	3.21	49	211	10,334	42.74
Total bituminous coal	749,848	64,432	5,985	820,265	4.11	359	169	60,755	13.50
Lignite:									
Custer		6,359		6,359	3.99	5	135	675	9.42
Dawson		4,140		4,140	3.35	3	102	320	12.94
Richland		4,512		4,512	4.00	8	70	561	8.04
Sheridan		10,824	34	10,858	3.54	15	142	2,123	5.11
Total lignite		25,835	34	25,869	3.70	31	119	3,679	7.03
Total Montana	749,848	90,267	6,019	846,134	4.10	390	165	64,434	13.13
NEW MEXICO									
Colfax	53,859	18,837	90	72,786	$6.15	66	233	15,454	4.71
McKinley	11,676	39,107	85	50,868	5.50	65	186	12,077	4.21
Rio Arriba	12,901	3,124		16,025	5.16	25	152	3,735	4.29
Sandoval		2,537		2,537	5.11	4	216	863	2.94
San Juan		9,946		9,946	4.89	22	188	4,127	2.41
Santa Fe	4,504	68	10	4,582	9.25	10	280	2,794	1.64
Socorro		1,500	200	1,700	5.21	5	180	899	1.89
Total New Mexico	82,940	75,119	385	158,444	5.82	197	203	39,949	3.97
NORTH DAKOTA (LIGNITE)									
Adams	23,602	14,887	100	38,589	$2.74	8	175	1,397	27.62
Bowman	211,948			211,948	1.85	18	242	4,349	48.73
Burke	368,238	30,207	61,062	459,507	2.31	61	233	14,306	32.12
Burleigh		18,867		18,867	3.26	3	160	480	39.31
Divide	256,997	29,877		286,874	2.45	44	217	9,566	29.99
Dunn		12,599	10	12,609	2.83	7	142	1,046	12.06
Grant		25,049		25,049	3.04	7	177	1,239	20.22
Hettinger	600	10,908		11,508	2.74	12	136	1,637	7.03
McKenzie		1,625		1,625	3.94	4	81	324	5.00
McLean	72,590	50,982	200	123,772	2.90	25	193	4,883	25.35
Mercer	915,209	20,458	58,023	993,690	2.25	103	214	22,107	44.95
Morton		30,934		30,934	2.47	14	173	2,415	12.81
Oliver		9,709	30	9,739	2.33	5	88	412	23.63
Stark		16,931	63,002	79,933	2.31	16	167	2,665	29.99
Ward	310,478	110,301	85,665	506,444	2.38	67	208	13,962	36.27
Williams		4,086		4,086	4.05	4	135	540	7.57
Total North Dakota	2,159,662	387,420	268,092	2,815,174	2.34	398	204	81,328	34.62

For footnotes, see end of table.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties—Continued

County	Production (net tons): Shipped by rail or water [1]	Production (net tons): Shipped by truck	Production (net tons): Used at mine [2]	Production (net tons): Total	Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
OHIO									
Athens	183,817	422,618	1,575	608,010	$4.23	381	182	69,294	8.77
Belmont	7,235,530	185,173	8,639	7,429,342	4.14	2,674	231	617,418	12.03
Carroll	218,435	319,944	4,681	543,060	3.36	176	260	45,764	11.87
Columbiana	98,541	1,372,296		1,470,837	3.31	385	247	94,951	15.49
Coshocton	573,336	488,808	748	1,062,892	3.68	289	255	73,778	14.41
Gallia	742,988	33,683		776,671	3.65	202	244	49,362	15.73
Guernsey	551,243	58,180	67	609,490	3.29	152	271	41,117	14.82
Harrison	9,893,475	321,522	54,670	10,269,667	4.21	2,109	289	610,335	16.83
Hocking	780	64,011	60	64,851	3.46	57	161	9,181	7.06
Holmes		30,544		30,544	3.36	13	203	2,639	11.57
Jackson	371,234	289,253		660,487	3.85	161	239	38,411	17.20
Jefferson	2,780,262	1,161,125	4,906	3,946,293	3.96	1,141	230	262,926	15.01
Lawrence	22,500	351,488	166	374,154	3.17	181	176	31,844	11.75
Mahoning	17,563	624,938	3,475	645,976	3.93	141	265	37,340	17.30
Meigs	665,125	140,594		805,719	3.20	268	210	56,394	14.29
Morgan	303,285	67,656	1,410,493	1,781,434	3.12	440	186	81,731	21.80
Muskingum	573,973	505,805	23	1,079,801	2.71	312	222	69,172	15.61
Noble	1,017,404	131,304	151	1,148,859	2.31	134	254	34,042	33.75
Perry	1,302,980	459,303	40	1,762,323	3.83	452	233	105,489	16.71
Portage		132,239	2,795	135,034	3.78	25	312	7,796	17.32
Stark		899,535		899,535	3.64	280	272	76,055	11.83
Tuscarawas	262,469	1,935,601	35,230	2,233,300	3.61	809	227	183,857	12.15
Vinton	54,967	116,137		171,104	4.51	117	152	17,787	9.62
Washington	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Wayne	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Other counties		424,174		424,174	3.19	82	289	23,691	17.90
Total Ohio	26,869,907	10,535,931	1,527,719	38,933,557	3.82	10,981	240	2,640,374	14.75
OKLAHOMA									
Coal		1,021		1,021	$8.30	5	169	928	1.10
Craig		31,489	7,643	39,132	3.57	21	302	6,192	6.32
Haskell	400,203			400,203	6.46	107	252	26,943	14.85
Latimer	60,769			60,769	5.53	27	139	3,750	16.21
Le Flore	286,514	9,943	88	296,545	6.57	225	150	33,643	8.81
McIntosh	212,000	1,200		213,200	3.05	37	300	11,197	19.04
Okmulgee	117,667	6,258	3	123,928	6.45	349	61	21,324	5.81
Pittsburg	260,370	1,000	506	261,876	8.60	314	228	71,551	3.66
Rogers	316,699	24,490		341,189	5.47	109	236	25,692	13.28
Sequoyah	267,890			267,890	6.52	52	355	18,324	14.62
Wagoner		1,234		1,234	6.89	4	82	346	3.57
Total Oklahoma	1,922,112	76,635	8,240	2,006,987	6.15	1,250	176	219,890	9.13

For footnotes, see end of table.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
PENNSYLVANIA									
Allegheny	5, 911, 043	1, 381, 904	414, 766	7, 707, 713	$5. 74	4, 111	221	909, 539	8. 47
Armstrong	1, 948, 107	289, 973	5, 610	2. 243, 690	4. 22	1, 288	173	222, 624	10. 08
Beaver	5, 072	430, 135	24, 814	460, 021	4. 00	225	214	48, 099	9. 56
Bedford	4, 620	151, 446	333	156, 399	4. 74	153	181	27, 759	5. 63
Blair	779	103, 167	10	103, 956	4. 06	55	193	10, 599	9. 81
Bradford	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Butler	1, 087, 075	1, 031, 529	5, 389	2, 123, 993	3. 70	722	231	166, 914	12. 73
Cambria	9, 575, 465	552, 923	887, 651	11, 016, 039	6. 19	8, 253	211	1, 741, 430	6. 33
Cameron	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Centre	1, 028, 446	489, 438	3, 095	1, 520, 979	3. 78	496	229	113, 684	13. 38
Clarion	2, 695, 646	800, 349	4, 916	3, 500, 911	3. 69	904	244	220, 672	15. 86
Clearfield	6, 316, 881	711, 984	16, 431	7, 045, 296	4. 29	3, 012	219	659, 229	10. 69
Clinton	384, 524	210, 541	95	595, 160	3. 89	154	239	36, 764	16. 19
Elk	234, 244	192, 875	100	427, 219	4. 50	283	175	49, 546	8. 62
Fayette	4, 985, 827	584, 614	438, 995	6, 009, 436	5. 45	4, 083	222	905, 327	6. 64
Fulton	35, 987	4, 254	288	40, 529	5. 92	41	60	2, 464	16. 45
Greene	12, 298, 791	54, 245	23, 783	12, 376, 819	5. 56	6, 597	235	1, 548, 558	7. 99
Huntingdon	20, 942	125, 332	133	146, 407	5. 14	106	176	18, 628	7. 86
Indiana	6, 224, 161	319, 862	540, 277	7, 084, 300	5. 14	3, 439	230	790, 041	8. 97
Jefferson	1, 518, 891	195, 504	6, 430	1, 720, 825	4. 30	1, 043	215	223, 805	7. 69
Lawrence	1, 894	789, 150	187	791, 231	3. 53	170	251	42, 677	18. 54
Lycoming	----------	56, 689	----------	56, 689	4. 51	28	248	6, 949	8. 16
McKean	57, 240	46, 614	10	103, 864	3. 21	30	225	6, 671	15. 57
Mercer	194, 923	472, 624	480	668, 027	3. 88	284	203	57, 751	11. 57
Somerset	3, 824, 866	493, 817	60, 769	4, 379, 452	4. 89	2, 984	204	607, 472	7. 21
Tioga	----------	93, 675	20	93, 695	5. 19	66	198	13, 086	7. 16
Venango	208, 862	603, 324	1, 000	813, 186	4. 00	150	269	40, 301	20. 18
Washington	13, 844, 719	1, 116, 826	185, 110	15, 146, 655	6. 31	7, 528	217	1, 633, 457	9. 27
Westmoreland	1, 965, 847	929, 462	976, 734	3, 872, 043	5. 19	2, 097	198	415, 536	9. 32
Other counties	42, 108	40, 050	----------	82, 158	4. 07	23	223	5, 135	16. 00
Total Pennsylvania	74, 416, 960	12, 272, 306	3, 597, 426	90, 286, 692	5. 31	48, 325	218	10, 524, 717	8. 58
SOUTH DAKOTA (LIGNITE)									
Dewey	----------	24, 519	----------	24, 519	$3. 66	9	279	2, 510	9. 77
TENNESSEE									
Anderson	865, 919	888, 770	2, 676	1, 757, 365	$3. 45	728	201	146, 547	11. 99
Bledsoe	37, 023	1, 843	----------	38, 866	4. 40	42	90	3, 760	10. 34
Campbell	777, 900	44, 672	1, 083	823, 655	5. 32	964	162	156, 111	5. 28
Claiborne	309, 511	93, 956	127	403, 594	4. 09	386	143	55, 021	7. 34
Cumberland	14, 000	74, 314	----------	88, 314	4. 27	72	132	9, 530	9. 27
Fentress	345, 989	5, 200	----------	351, 189	3. 39	214	150	32, 197	10. 91
Grundy	419, 553	----------	850	420, 403	4. 02	363	161	58, 317	7. 21
Hamilton	142, 416	7, 541	----------	149, 957	4. 14	132	131	17, 281	8. 68
Marion	2, 150, 352	54, 176	121	2, 204, 649	4. 49	1, 796	181	324, 858	6. 79
Morgan	71, 516	410, 242	4, 714	486, 472	3. 76	445	234	104, 081	4. 67
Overton	46, 783	1, 456	10	48, 249	3. 21	88	130	11, 475	4. 20
Putnam	641, 282	38, 271	756	680, 309	4. 16	251	230	57, 751	11. 78
Rhea	1, 150	41, 009	----------	42, 159	3. 50	50	148	7, 358	5. 73
Scott	496, 441	160, 756	75	657, 272	3. 30	422	186	78, 630	8. 36
Sequatchie	352, 123	----------	30	352, 153	3. 54	327	175	57, 115	6. 17
Van Buren	83, 732	----------	----------	83, 732	3. 98	68	128	8, 734	9. 59
White	14, 193	245, 239	----------	259, 432	3. 31	58	160	9, 298	27. 90
Total Tennessee	6, 769, 883	2, 067, 445	10, 442	8, 847, 770	4. 02	6, 406	178	1, 138, 064	7. 77

For footnotes, see end of table.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Tota					
UTAH									
Carbon	4,584,910	111,295	241,130	4,937,335	$5.46	2,180	219	477,498	10.34
Emery	1,311,358	160,831	7,956	2,480,145	4.67	655	235	154,021	9.61
Garfield		1,352		1,352	4.85	3	155	451	3.00
Iron		36,996		36,996	5.15	17	279	4,743	7.80
Kane		2,269		2,269	4.85	2	100	200	11.35
Sevier	46,700			46,700	5.65	10	249	2,520	18.53
Summit		17,311	56	17,367	4.04	13	222	2,880	6.03
Total Utah	5,942,968	330,054	249,142	6,522,164	5.28	2,880	223	642,313	10.15
VIRGINIA									
Buchanan	8,239,875	1,181,452	8,910	9,430,237	$4.84	6,056	197	1,195,215	7.89
Dickenson	3,917,018	852,197	23,669	4,792,884	5.31	2,308	241	556,638	8.61
Lee	651,704	101,445	8,435	761,584	6.09	814	172	139,997	5.44
Montgomery		7,340		7,340	6.08	17	99	1,691	4.34
Russell	1,276,419	182,957	11,735	1,471,111	4.53	869	223	193,895	7.59
Scott		7,300		7,300	4.70	10	166	1,659	4.40
Tazewell	3,442,490	85,976	13,998	3,542,464	6.06	2,156	202	434,839	8.15
Wise	7,326,371	574,021	149,463	8,049,855	4.25	3,627	217	788,579	10.21
Total Virginia	24,853,877	2,992,688	216,210	28,062,775	4.92	15,857	209	3,312,513	8.47
WASHINGTON									
King	67,332	40,043		107,375	$7.96	88	231	20,336	5.28
Kittitas	316,721	17,994	8,439	343,154	7.21	332	205	68,200	5.03
Lewis		5,078		5,078	6.12	5	208	1,119	4.54
Thurston		17,013		17,013	4.28	6	243	1,460	11.65
Total Washington	384,053	80,128	8,439	472,620	7.26	431	211	91,115	5.19
WEST VIRGINIA									
Barbour	3,758,532	51,246	918	3,810,696	$4.30	1,365	202	276,320	13.79
Boone	6,873,341	51,827	10,915	6,936,083	5.12	3,343	215	717,919	9.66
Braxton	97,161	5,582		102,743	4.45	92	213	19,607	5.24
Brooke	326,155	136,404	686,726	1,149,285	4.22	552	201	110,718	10.38
Clay	1,280,696	4,246		1,284,942	5.17	738	199	146,803	8.75
Fayette	7,687,782	251,848	156,871	8,096,501	5.78	5,255	229	1,204,767	6.72
Gilmer	263,483	2,000		265,483	4.27	55	169	9,291	28.57
Grant		67,420		67,420	4.73	119	199	23,716	2.84
Greenbrier	1,510,949	60,122	2,018	1,573,089	5.37	757	224	169,662	9.27
Hancock		20,089		20,089	4.59	20	136	2,728	7.36
Harrison	9,913,545	147,393	1,556	10,062,494	4.16	3,044	205	624,559	16.11
Kanawha	9,912,117	486,508	225,035	10,623,660	4.81	4,086	225	917,437	11.58
Lewis	1,371,976	11,139		1,383,115	3.43	201	246	49,374	28.01
Logan	22,072,824	16,048	51,025	22,139,897	5.11	9,759	233	2,277,127	9.72
Marion	10,166,898	117,645	7,819	10,292,362	5.24	4,006	213	854,289	12.05
Marshall	500,233	7,043	12,184	519,460	4.52	203	225	45,567	11.40
Mason	163,139	31,278		194,417	3.45	92	248	22,846	8.51

For footnotes, see end of table.

TABLE 49.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous-coal and lignite mines in the United States, 1956, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
WEST VIRGINIA—Continued									
McDowell	19, 216, 070	286, 896	420, 868	19, 923, 834	$6. 48	9, 911	236	2, 339, 113	8. 52
Mercer	1, 872, 582	28, 482	9, 059	1, 910, 123	6. 25	1, 193	220	261, 985	7. 29
Mineral	125, 286	7, 215	13	132, 514	4. 11	122	191	23, 354	5. 67
Mingo	8, 654, 578	100, 886	18, 718	8, 774, 182	5. 08	3, 423	224	768, 321	11. 42
Monongalia	8, 531, 707	130, 417	1, 095	8, 663, 219	4. 51	3, 141	214	671, 597	12. 90
Nicholas	5, 862, 017	162, 408	42, 006	6, 066, 431	5. 38	3, 144	224	704, 428	8. 61
Ohio	1, 204, 881	42, 097	4, 000	1, 250, 978	4. 58	401	242	96, 975	12. 90
Pocahontas	479, 035	----	----	479, 035	5. 74	321	227	72, 806	6. 58
Preston	1, 667, 160	966, 505	108, 584	2, 742, 249	3. 53	1, 833	220	402, 642	6. 81
Putnam	----	147, 553	----	147, 553	4. 52	47	229	10, 767	13. 70
Raleigh	10, 381, 210	343, 531	40, 050	10, 764, 791	6. 19	6, 269	234	1, 469, 332	7. 33
Randolph	994, 107	24, 294	8, 728	1, 027, 129	5. 64	861	190	163, 459	6. 28
Summers	----	5, 794	----	5, 794	6. 50	10	116	1, 163	4. 98
Taylor	357, 839	8, 390	----	366, 229	3. 58	159	209	33, 211	11. 03
Tucker	135, 266	----	----	135, 266	3. 53	67	231	15, 456	8. 75
Upshur	1, 377, 510	29, 799	209	1, 407, 518	4. 00	545	223	121, 762	11. 56
Wayne	98, 465	10, 351	----	108, 816	3. 75	95	175	16, 562	6. 57
Webster	1, 197, 861	12, 318	2, 669	1, 212, 848	5. 60	649	225	145, 888	8. 31
Wyoming	12, 128, 804	80, 807	40, 593	12, 250, 204	5. 86	6, 118	221	1, 354, 733	9. 04
Total West Virginia	150, 183, 209	3, 855, 581	1, 851, 659	155, 890, 449	5. 29	71, 996	224	16, 146, 284	9. 65
WYOMING									
Campbell	302, 352	70, 808	798	373, 958	$1. 21	27	308	8, 297	45. 07
Carbon	150, 794	10, 705	2, 504	164, 003	3. 88	33	226	7, 454	22. 00
Converse	----	6, 593	15	6, 608	3. 26	3	253	760	8. 69
Fremont	----	2, 060	1	2, 061	6. 60	9	126	1, 073	1. 92
Hot Springs	8, 875	7, 550	----	16, 425	7. 69	10	162	1, 620	10. 14
Johnson	----	1, 177	----	1, 177	4. 50	3	221	661	1. 78
Lincoln	685, 398	2, 428	2, 271	690, 097	2. 91	145	199	28, 839	23. 93
Sheridan	374, 063	37, 344	----	411, 407	3. 26	80	221	17, 693	23. 25
Sweetwater	828, 229	7, 372	52, 043	887, 644	5. 99	564	179	100, 864	8. 80
Total Wyoming	2, 349, 711	146, 037	57, 632	2, 553, 380	3. 89	874	191	167, 261	15. 27
UNITED STATES									
Total United States	440, 746, 879	49, 768, 251	10, 358, 947	500, 874, 077	$4. 82	228, 163	214	48, 732, 172	10. 28

[1] Includes coal loaded at mines directly into railroad cars or river barges, hauled by trucks to railroad sidings, and hauled by trucks to waterways.
[2] Includes coal transported from mines to point of use by conveyor belts or trams, used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, made into beehive coke at mines, and all other uses at mines.
[3] Value received or charged for coal f. o. b. mines. Includes a value for coal not sold but used by producers, such as mine fuel and coal coked, as estimated by producers at average prices that might have been received if such coal had been sold commercially.
[4] In certain counties the average tons per man per day is large due to auger mining, strip mining, or mechanical loading underground.
[5] Included in "Other counties" to avoid disclosing individual operations.

TRANSPORTATION

Within recent years the methods of shipping bituminous coal and lignite from the mines have changed radically; shipments by rail have declined, whereas shipments by water and truck have increased. Generally, the cost by water or truck, particularly for short distances, is less than the rail freight rate.

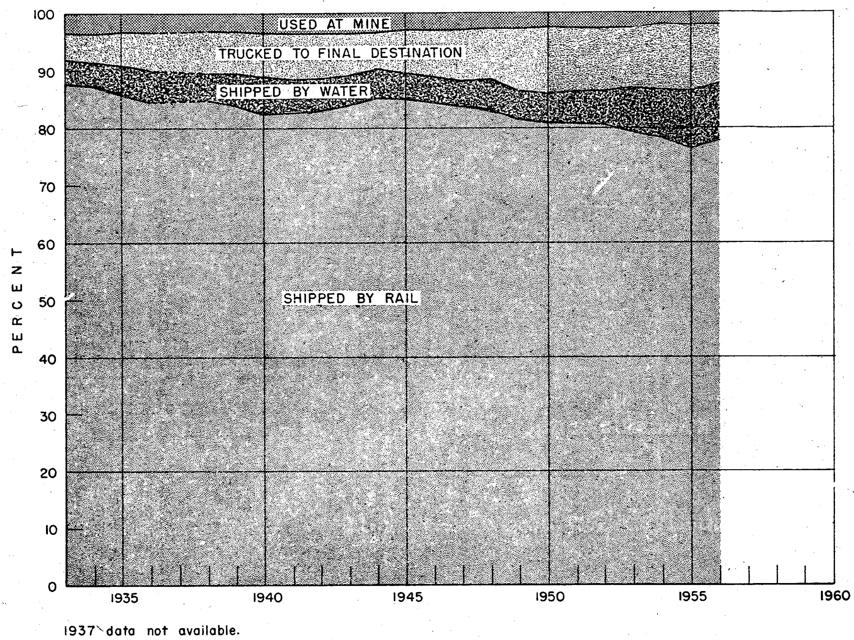

FIGURE 12.—Percentage of total production of bituminous coal and lignite, 1933–56, by method of shipment from mines and used at mines.

TABLE 50.—Method of shipment of bituminous coal and lignite from mines, and used at mines, in the United States, 1933–56

Year	Method of shipment from mines			Used at mines [1]	Total production
	Shipped by rail and trucked to rail	Shipped by water and trucked to water	Trucked to final destination		
	THOUSAND NET TONS				
1933	293, 258	13, 021	15, 463	11, 888	333, 630
1934	313, 304	15, 128	18, 739	12, 197	359, 368
1935	319, 742	18, 327	21, 960	12, 344	372, 373
1936	370, 763	24, 868	27, 929	15, 528	439, 088
1937	(2)	(2)	(2)	(2)	445, 531
1938	295, 336	16, 903	25, 592	10, 714	348, 545
1939	331, 190	22, 229	29, 534	11, 902	394, 855
1940	380, 388	29, 493	35, 540	15, 350	460, 771
1941	425, 184	30, 240	40, 056	18, 669	514, 149
1942	482, 814	34, 018	45, 154	20, 707	582, 693
1943	495, 863	30, 188	42, 433	21, 693	590, 177
1944	527, 136	31, 518	40, 123	20, 799	619, 576
1945	490, 472	27, 548	41, 477	18, 120	577, 617
1946	450, 615	24, 642	42, 731	15, 934	533, 922
1947	527, 282	29, 803	55, 859	17, 680	630, 624
1948	498, 194	26, 735	58, 260	16, 329	599, 518
1949	356, 602	21, 829	47, 786	11, 651	437, 868
1950	417, 225	27, 583	58, 286	13, 217	516, 311
1951	430, 387	29, 984	58, 132	15, 162	533, 665
1952	375, 911	27, 746	50, 231	12, 953	466, 841
1953	362, 133	35, 648	47, 102	12, 407	457, 290
1954	305, 918	32, 912	44, 689	8, 187	391, 706
1955	355, 924	47, 476	51, 607	9, 626	464, 633
1956	390, 015	50, 732	49, 768	10, 359	500, 874
	PERCENTAGE OF TOTAL				
1933	87. 9	3. 9	4. 6	3. 6	100. 0
1934	87. 2	4. 2	5. 2	3. 4	100. 0
1935	85. 9	4. 9	5. 9	3. 3	100. 0
1936	84. 4	5. 7	6. 4	3. 5	100. 0
1937	(2)	(2)	(2)	(2)	100. 0
1938	84. 7	4. 9	7. 3	3. 1	100. 0
1939	83. 9	5. 6	7. 5	3. 0	100. 0
1940	82. 6	6. 4	7. 7	3. 3	100. 0
1941	82. 7	5. 9	7. 8	3. 6	100. 0
1942	82. 9	5. 8	7. 7	3. 6	100. 0
1943	84. 0	5. 1	7. 2	3. 7	100. 0
1944	85. 1	5. 1	6. 5	3. 3	100. 0
1945	84. 9	4. 8	7. 2	3. 1	100. 0
1946	84. 4	4. 6	8. 0	3. 0	100. 0
1947	83. 6	4. 7	8. 9	2. 8	100. 0
1948	83. 1	4. 5	9. 7	2. 7	100. 0
1949	81. 4	5. 0	10. 9	2. 7	100. 0
1950	80. 8	5. 3	11. 3	2. 6	100. 0
1951	80. 7	5. 6	10. 9	2. 8	100. 0
1952	80. 5	5. 9	10. 8	2. 8	100. 0
1953	79. 2	7. 8	10. 3	2. 7	100. 0
1954	78. 1	8. 4	11. 4	2. 1	100. 0
1955	76. 6	10. 2	11. 1	2. 1	100. 0
1956	77. 9	10. 1	9. 9	2. 1	100. 0

[1] Includes coal used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, transported from mines to point of use by conveyors or trams, made into beehive coke at mines, and all other uses at mines.
[2] Data not available.

TABLE 51.—Bituminous coal and lignite loaded for shipment by railroads and waterways in the United States, 1956, as reported by mine operators

Route	State	Net tons: By State	Net tons: Total for route
RAILROAD			
Alabama Central	Alabama	124,753	124,753
Alaska	Alaska	708,360	708,360
Atchison, Topeka & Santa Fe	Colorado	55,231	428,669
	Illinois	303,399	
	New Mexico	70,039	
Baltimore & Ohio	Illinois	233,570	42,719,020
	Indiana	17,514	
	Maryland	134,287	
	Ohio	3,898,979	
	Pennsylvania	7,597,055	
	West Virginia	30,837,615	
Bessemer & Lake Erie	Pennsylvania	1,448,877	1,448,877
Cambria & Indiana	Pennsylvania	2,805,971	2,805,971
Campbell's Creek	West Virginia	611,943	611,943
Carbon County	Utah	1,550,651	1,550,651
Castleman River	Maryland	14,384	14,384
Central of Georgia	Alabama	47,310	47,310
Chesapeake & Ohio	Kentucky	11,057,533	60,295,491
	Ohio	128,365	
	Virginia	1,005,600	
	West Virginia	48,103,993	
Cheswick & Harmar	Pennsylvania	637,763	637,763
Chicago, Burlington & Quincy	Illinois	7,529,352	8,969,661
	Iowa	238,539	
	Missouri	516,480	
	Wyoming	685,290	
Chicago & Eastern Illinois	Illinois	2,475,817	3,335,813
	Indiana	859,996	
Chicago & Illinois Midland	Illinois	3,281,046	3,281,046
Chicago, Milwaukee, St. Paul & Pacific	Indiana	2,401,138	2,965,240
	Montana (bituminous)	306,578	
	North Dakota (lignite)	257,524	
Chicago & North Western	Illinois	540,693	540,693
Chicago, Rock Island & Pacific	Illinois	750,737	1,200,093
	Iowa	130,014	
	Missouri	256,073	
	Oklahoma	63,269	
Clinchfield	Kentucky	107,957	4,991,060
	Virginia	4,883,103	
Colorado & Southern	Colorado	9,276	9,276
Colorado & Wyoming	Colorado	1,140,680	1,140,680
Conemaugh & Black Lick	Pennsylvania	522,967	522,967
Denver & Rio Grande Western	Colorado	1,058,086	4,269,710
	New Mexico	12,901	
	Utah	3,198,723	
East Broad Top R. R. & Coal Co	Pennsylvania	56,929	56,929
Erie	Ohio	36,880	409,178
	Pennsylvania	372,298	
Fort Smith & Van Buren	Oklahoma	234,210	234,210
Great Northern	North Dakota (lignite)	625,235	625,235
Gulf, Mobile & Ohio	Alabama	209,932	1,183,898
	Illinois	973,966	
Illinois Central	Illinois	12,748,607	31,726,979
	Indiana	24,834	
	Kentucky	18,953,538	
Illinois Terminal	Illinois	985,143	985,143
Interstate	Kentucky	182,101	5,112,559
	Virginia	4,930,458	
Johnstown & Stony Creek	Pennsylvania	386,159	386,159
Kansas City Southern	Missouri	663,090	1,020,755
	Oklahoma	357,665	

See footnotes at end of table.

TABLE 51.—Bituminous coal and lignite loaded for shipment by railroads and waterways in the United States, 1956, as reported by mine operators—Con.

Route	State	Net tons: By State	Net tons: Total for route
RAILROAD—continued			
Kelley's Creek & Northwestern	West Virginia	518,462	518,462
Kentucky & Tennessee	Kentucky	450,409	450,409
Lake Erie, Franklin & Clarion	Pennsylvania	962,963	962,963
Litchfield & Madison	Illinois	294,377	294,377
Louisville & Nashville	Alabama	2,705,814	30,652,259
	Kentucky	27,407,259	
	Tennessee	387,527	
	Virginia	151,659	
Mary Lee	Alabama	536,777	536,777
Midland Valley	Arkansas	195,575	549,926
	Oklahoma	354,351	
Minneapolis & St. Louis	Illinois	1,148,803	1,160,852
	Iowa	12,049	
Minneapolis, St. Paul & Sault Ste. Marie	North Dakota (lignite)	383,068	383,068
Missouri-Illinois	Illinois	809,402	809,402
Missouri-Kansas-Texas	Kansas	441,128	1,503,009
	Missouri	592,011	
	Oklahoma	469,870	
Missouri Pacific	Arkansas	280,674	4,021,966
	Illinois	3,488,474	
	Kansas	183,008	
	Missouri	69,810	
Monon	Indiana	357,089	357,089
Monongahela	Pennsylvania	1,311,781	8,389,677
	West Virginia	7,077,896	
Montour	Pennsylvania	2,220,418	2,220,418
Nashville, Chattanooga & St. Louis	Tennessee	2,087,185	2,087,185
New York Central (includes coal shipped over Kanawha & Michigan, Kelley's Creek, Toledo & Ohio Central, and Zanesville & Western	Illinois	4,681,117	21,130,822
	Indiana	4,867,053	
	Ohio	3,451,956	
	Pennsylvania	5,628,258	
	West Virginia	2,502,438	
New York, Chicago & St. Louis	Ohio	9,006,264	9,006,264
Norfolk & Western	Kentucky	4,866,224	46,786,280
	Ohio	22,500	
	Virginia	13,067,577	
	West Virginia	28,829,979	
Northern Pacific	Montana (bituminous)	443,270	1,653,826
	North Dakota (lignite)	893,835	
	Washington	316,721	
Pacific Coast	Washington	67,332	67,332
Pennsylvania (includes Pittsburgh, Cincinnati, Chicago, & St. Louis)	Illinois	5,384	29,201,072
	Indiana	3,312,691	
	Ohio	4,770,909	
	Pennsylvania	21,044,632	
	West Virginia	67,456	
Pittsburgh & Lake Erie	Pennsylvania	911,999	911,999
Pittsburg & Shawmut	Pennsylvania	1,405,672	1,405,672
Pittsburgh & West Virginia	Ohio	909,957	981,255
	Pennsylvania	71,298	
St. Louis-San Francisco	Alabama	840,050	2,092,877
	Arkansas	102,863	
	Kansas	134,283	
	Missouri	572,934	
	Oklahoma	442,747	
Southern	Alabama	669,651	3,304,770
	Indiana	298,679	
	Kentucky	533,463	
	Tennessee	987,497	
	Virginia	815,480	
Southern Iowa	Iowa	38,258	38,258

See footnotes at end of table.

TABLE 51.—Bituminous coal and lignite loaded for shipment by railroads and waterways in the United States, 1956, as reported by mine operators—Con.

Route	State	Net tons: By State	Net tons: Total for route
RAILROAD—continued			
Tennessee	Tennessee	1,160,263	1,160,263
Tennessee Central	Tennessee	1,034,054	1,034,054
Tennessee Coal, Iron & Railroad Co	Alabama	2,969,133	2,969,133
Thomas & Sayreton	Alabama	302,127	302,127
Toledo, Peoria, & Western	Illinois	448,800	448,800
Union	Pennsylvania	1,450	1,450
Union Pacific	Colorado	395,642	2,060,063
	Wyoming	1,664,421	
Unity	Pennsylvania	403,488	403,488
Utah	Utah	1,193,594	1,193,594
Virginian	West Virginia	16,646,291	16,646,291
Wabash	Iowa	397,350	548,613
	Missouri	151,263	
West Virginia Northern	West Virginia	143,360	143,360
Western Allegheny	Pennsylvania	384,073	384,073
Western Maryland	Maryland	186,008	5,381,779
	Pennsylvania	419,172	
	West Virginia	4,776,599	
Winifrede	West Virginia	434,437	434,437
Woodward Iron Co	Alabama	989,316	989,316
Youngstown & Southern	Ohio	75,659	75,659
Total railroad shipments		390,015,242	390,015,242
WATERWAY			
Allegheny River	Pennsylvania	2,226,095	2,226,095
Black Warrior River	Alabama	467,178	467,178
Green River	Kentucky	976,617	976,617
Illinois River	Illinois	1,229,804	1,229,804
Inland Water Way	Alabama	432,346	432,346
Kanawha River	West Virginia	4,413,407	4,413,407
Kentucky River	Kentucky	61,422	61,422
Monongahela River	Pennsylvania	23,597,642	28,007,459
	West Virginia	4,409,817	
Ohio River	Illinois	343,468	11,803,952
	Indiana	2,686,824	
	Kentucky	3,395,706	
	Ohio	4,568,438	
	West Virginia	809,516	
Tennessee River	Tennessee	1,113,357	1,113,357
Total waterway shipments		50,731,637	50,731,637
Total loaded at mines for shipment by railroads and waterways.		440,746,879	440,746,879
Shipped by truck from mine to final destination		49,768,251	49,768,251
Used at mine [1]		10,358,947	10,358,947
Total production, 1956		500,874,077	500,874,077

[1] Includes coal used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, transported from mines to point of use by conveyors or trams, made into beehive coke at mines, and all other uses at mines.

CONSUMPTION

The statistics on consumption of bituminous coal and lignite, by major consumer classes, are based upon complete coverage of all consumers in each class except "Other industrials" and "Retail deliveries." The figures for these categories are based upon a monthly sample approximating 35-percent coverage. In each instance a benchmark was established in 1943, based upon 95-percent coverage. Since 1943 data for each month have been determined by matching identical plants reporting for the preceding 2 months, calculating the percentage change from the previous month, and applying this percentage change to the published figure for the previous month. The results obtained have been reasonably reliable over a period of years. The total of classes shown approximates total consumption and is a much more reliable figure than "calculated" consumption based on production, imports, exports, and changes in stocks, because certain significant items of stocks are not included in year-end stocks.

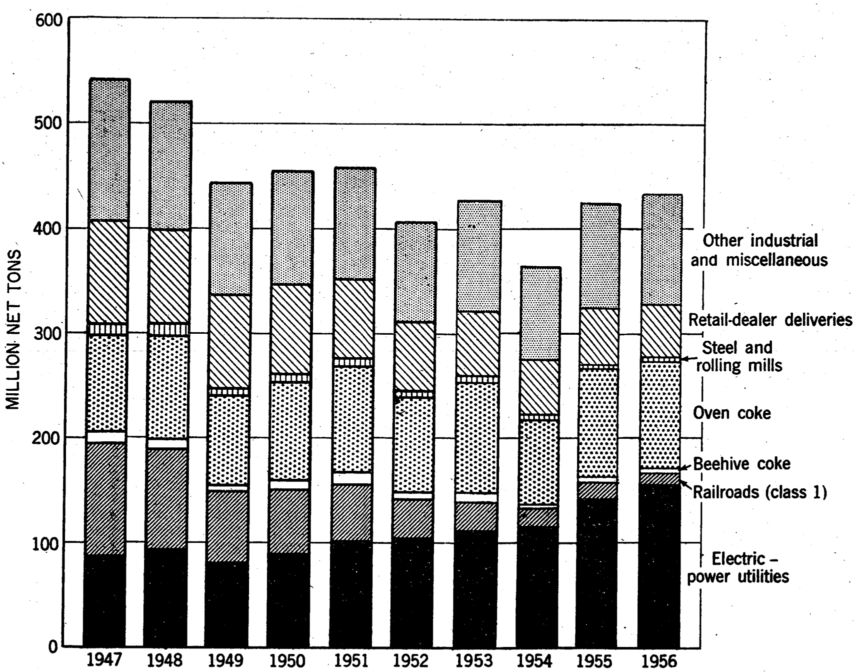

FIGURE 13.—Consumption of bituminous coal and lignite, by consumer class, and retail dealer deliveries in the United States, 1947–56.

TABLE 52.—Consumption of bituminous coal and lignite, by consumer class, with retail dealer deliveries in the United States, 1933–56, in thousand net tons

Year and month	Electric power utilities [1]	Bunker foreign trade [2]	Railroads [3] (class I)	Coke plants		Steel and rolling mills	Cement mills [4]	Other industrials [5]	Retail dealer deliveries [6]	Total of classes shown [7]
				Beehive	Ovens					
1933	27,088	1,316	72,548	1,408	38,681	10,009	2,832	83,321	80,482	317,685
1934	29,707	1,321	76,037	1,635	44,343	10,898	3,500	89,448	86,925	343,814
1935	30,936	1,576	77,109	1,469	49,046	11,747	3,516	96,937	83,990	356,326
1936	38,104	1,622	86,391	2,698	63,244	13,471	4,771	113,792	84,200	408,293
1937	41,045	1,832	88,080	4,927	69,575	12,853	5,247	127,142	80,076	430,777
1938	36,440	1,352	73,921	1,360	45,266	8,412	4,483	96,527	68,520	336,281
1939	42,304	1,477	79,072	2,298	61,216	9,808	5,274	103,079	71,570	376,098
1940	49,126	1,426	85,130	4,803	76,583	10,040	5,633	110,469	87,700	430,910
1941	59,888	1,643	97,384	10,529	82,609	10,902	6,832	124,868	97,460	492,115
1942	63,472	1,585	115,410	12,876	87,974	10,434	7,570	135,979	104,750	540,050
1943	74,036	1,647	130,283	12,441	90,019	11,238	5,851	145,518	122,764	593,797
1944	76,656	1,559	132,049	10,858	94,438	10,734	3,789	134,610	124,906	589,599
1945	71,603	1,785	125,120	8,135	87,214	10,084	4,215	129,606	121,805	559,567
1946	68,743	1,381	110,166	7,167	76,121	8,603	7,009	120,610	100,586	500,386
1947	86,009	1,689	109,296	10,475	94,325	10,048	7,938	126,948	99,163	545,891
1948	95,620	1,057	94,838	10,322	96,984	10,046	8,554	112,741	89,747	519,909
1949	80,610	874	68,123	5,354	85,882	7,451	7,988	98,957	90,299	445,538
1950	88,262	717	60,969	9,088	94,757	7,698	7,943	98,164	86,604	454,202
1951	101,898	890	54,005	11,418	102,030	7,973	8,525	105,634	76,531	468,904
1952	103,309	723	37,962	6,912	90,702	6,820	8,073	95,863	68,393	418,757
1953	112,283	605	27,735	8,226	104,648	6,207	8,362	97,437	61,295	426,798
1954	115,235	427	17,370	980	84,411	4,944	8,124	78,953	52,616	363,060
1955:										
January	11,756	2	1,415	102	8,252	506	755	7,316	6,233	36,337
February	10,907	3	1,271	108	7,625	504	670	6,892	5,853	33,833
March	11,216	11	1,278	176	8,749	511	707	7,578	4,862	35,088
April	9,871	44	1,203	207	8,519	417	672	7,411	2,839	31,183
May	10,504	35	1,240	228	8,922	387	714	7,093	2,355	31,478
June	10,807	55	1,159	257	8,515	365	687	6,887	2,640	31,372
July	11,460	49	1,154	238	8,613	342	707	6,508	2,358	31,429
August	12,286	56	1,253	273	8,879	357	710	7,003	3,400	34,217
September	11,791	52	1,228	269	8,849	364	703	7,283	4,311	34,850
October	12,377	60	1,351	300	9,147	407	732	8,339	4,820	37,533
November	13,053	56	1,435	320	9,014	486	768	9,281	6,194	30,607
December	14,522	22	1,486	391	9,424	575	903	10,265	7,897	45,485
Total	140,550	445	15,473	2,869	104,508	5,221	8,728	91,856	53,762	423,412
1956:										
January	14,941	3	1,362	424	9,450	565	848	10,019	7,881	45,493
February	13,147	5	1,197	414	8,821	520	753	9,358	6,990	41,205
March	13,081	5	1,206	457	9,424	533	789	9,629	5,997	41,121
April	11,674	40	1,093	415	9,066	465	737	8,377	4,186	36,053
May	11,786	62	1,028	433	9,168	400	768	7,866	2,976	34,487
June	12,065	63	865	359	8,485	376	748	6,906	2,005	31,872
July	11,747	57	709	102	3,130	142	764	6,004	1,951	24,606
August	12,909	59	868	186	7,783	333	766	6,652	2,802	32,358
September	12,169	58	916	246	8,915	358	720	6,645	3,195	33,222
October	13,238	60	1,008	301	9,266	437	753	7,695	3,521	36,279
November	13,757	61	1,019	339	8,979	457	786	8,072	3,648	37,118
December	14,469	27	1,037	367	9,383	523	838	8,427	3,973	39,044
Total	154,983	500	12,308	4,043	101,870	5,109	9,270	95,650	49,125	432,858

[1] Federal Power Commission. Represents latest available revised figures for bituminous coal and lignite consumed by public-utility powerplants in power generation, including a small quantity of coke.
[2] Bureau of Census, U. S. Department of Commerce.
[3] Association of American Railroads. Represents consumption of bituminous coal and lignite by class I railways for all uses, including locomotive, powerhouse, shop, and station fuel. The Interstate Commerce Commission reports that in 1956 consumption for all uses by class I line-haul railways, plus purchases for class II and class III railways, plus purchases by all switching terminal companies was 12,920,456 tons of bituminous coal and lignite.
[4] Includes a small amount of anthracite.
[5] Estimates based upon reports collected from a selected list of representative manufacturing plants. "Other" means all consumption other than that shown in the specific classes listed. Includes coal consumed by manufacturing plants, mineral industries, for lake vessel fuel, and for many small miscellaneous uses.
[6] Estimates based upon reports collected from a selected list of representative retailers. Includes some coal shipped by truck from mine to final destination and some coal consumed by small manufacturing plants.
[7] The total of classes shown approximates total consumption. It is not possible to calculate consumption closely from production, imports, exports, and changes in stocks because certain significant items of stocks are not included in year-end stocks. These items are: Stocks on lake and tidewater docks, stocks at other intermediate storage piles between mine and consumer, and coal in transit.

TABLE 53.—Fuel economy in consumption of coal at electric-utility powerplants in the United States, 1919–56

Year	Coal consumed per kilowatt-hour (pounds)	Index numbers based on 1919 as 100	Year	Coal consumed per kilowatt-hour (pounds)	Index numbers based on 1919 as 100	Year	Coal consumed per kilowatt-hour (pounds)	Index numbers based on 1919 as 100
1919	3.20	100.0	1932	1.49	46.6	1945	1.30	40.6
1920	3.00	93.8	1933	1.46	45.6	1946	1.29	40.3
1921	2.70	84.4	1934	1.45	45.3	1947	1.31	40.9
1922	2.50	78.1	1935	1.44	45.0	1948	1.30	40.6
1923	2.40	75.0	1936	1.44	45.0	1949	1.24	38.8
1924	2.20	68.8	1937	1.44	45.0	1950	1.19	37.2
1925	2.00	62.5	1938	1.40	43.8	1951	1.14	35.6
1926	1.90	59.4	1939	1.38	43.1	1952	1.10	34.4
1927	1.82	56.9	1940	1.34	41.9	1953	1.06	33.1
1928	1.73	54.1	1941	1.34	41.9	1954	.99	30.9
1929	1.66	51.9	1942	1.30	40.6	1955	.95	29.7
1930	1.60	50.0	1943	1.30	40.6	1956	.94	29.4
1931	1.52	47.5	1944	1.29	40.3			

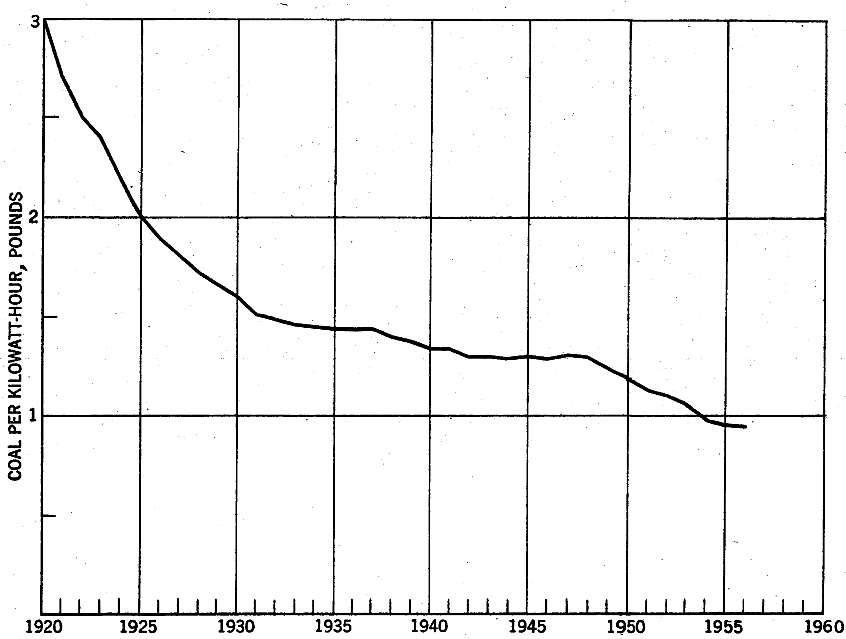

FIGURE 14.—Trend in fuel economy at electric-utility powerplants in the United States, 1920–56.

RELATIVE RATE OF GROWTH OF MINERAL FUELS AND WATERPOWER

Information on the trends in consumption of the various energy fuels and waterpower is given in the Review of Mineral-Fuel Industries, Minerals Yearbook, volume II, 1956.

STOCKS

The figures on stocks are based on complete coverage for all categories except "Other industrials" and "Retail yards." Stocks for these two categories are based on samples, and the same statistical procedure is followed as that for calculating total consumption.

TABLE 54.—Stocks of bituminous coal and lignite in hands of commercial consumers and in retail dealers' yards in the United States, 1955–56

Date	Total stocks (net tons)	Days' supply at current rate of consumption on date of stock taking							
		Coke ovens	Steel plants	Other industrials	Electric utilities	Retail yards	Railroads	Cement mills	Total
1955									
January 31	65,869,000	43	34	53	101	3	31	47	56
February 28	63,751,000	41	28	50	95	3	30	45	53
March 31	63,664,000	38	31	51	102	4	30	42	56
April 30	64,001,000	38	38	50	113	8	30	43	62
May 31	66,356,000	40	45	56	113	12	30	44	65
June 30	69,452,000	45	46	58	109	13	32	50	66
July 31	68,042,000	44	50	63	104	16	30	51	67
August 31	70,988,000	48	49	61	99	12	29	54	64
September 30	71,700,000	47	48	56	102	9	28	55	62
October 31	71,747,000	47	43	50	101	8	26	55	59
November 30	70,325,000	45	33	42	92	5	23	52	52
December 31	68,423,000	44	31	39	82	4	23	45	47
1956									
January 31	65,797,000	41	32	40	76	4	24	41	45
February 29	65,261,000	41	31	41	80	4	24	40	46
March 31	65,847,000	42	31	43	87	3	24	39	50
April 30	67,237,000	43	35	48	97	5	25	41	56
May 31	71,796,000	46	44	57	106	9	27	44	65
June 30	73,678,000	50	44	64	103	15	34	48	69
July 31	71,489,000	(1)	(1)	69	109	17	42	51	(1)
August 31	74,312,000	53	50	65	103	13	33	55	71
September 30	76,026,000	46	44	63	110	10	30	52	68
October 31	78,897,000	47	43	57	109	10	28	64	67
November 30	78,976,000	47	38	52	102	10	24	62	64
December 31	78,008,000	46	32	52	99	9	26	62	62

[1] Figures on days' supply not calculated owing to low consumption caused by strike.

PRICES

TABLE 55.—Average value per ton, f. o. b. mines, of bituminous coal and lignite produced in the United States, 1955–56, by States

State	1955 Underground mines	1955 Strip mines	1955 Auger mines	1955 Total, all mines	1956 Underground mines	1956 Strip mines	1956 Auger mines	1956 Total, all mines
Alabama	$6.24	$5.12	$4.57	$6.06	$6.51	$5.13	$5.40	$6.26
Alaska	9.94	8.44		9.00	9.00	8.64		8.77
Arizona	6.66			6.66	6.56			6.56
Arkansas	7.56	7.37		7.48	8.13	7.36		7.80
California (lignite)		10.00		10.00		10.00		10.00
Colorado	5.82	3.99		5.63	5.86	3.93		5.66
Georgia	5.00			5.00	5.00	5.00		5.00
Illinois	3.71	3.57		3.66	3.84	3.84		3.84
Indiana	3.81	3.49		3.59	4.02	3.63		3.75
Iowa	4.06	3.33		3.50	4.04	3.34		3.48
Kansas	4.74	4.26		4.27	5.63	4.34		4.36
Kentucky	4.50	2.99	3.39	4.18	4.78	3.25	5.04	4.44
Maryland	4.31	3.44		3.91	4.69	3.32		4.01
Missouri	5.07	3.89		3.95	5.15	3.98		4.03
Montana:								
Bituminous	4.97	2.00		3.01	5.17	3.21		4.11
Lignite	3.91	3.50		3.82	3.83	3.43		3.70
Total Montana	4.91	2.01		3.03	5.11	3.21		4.10
New Mexico	6.19	5.78		6.13	5.74	6.82		5.82
North Dakota (lignite)	3.45	2.33		2.34	3.61	2.33		2.34
Ohio	4.09	3.26	3.24	3.53	4.42	3.50	3.42	3.82
Oklahoma	7.66	5.00		5.86	8.11	5.51		6.15
Pennsylvania	5.63	3.62	3.10	5.14	5.82	3.90	3.33	5.31
South Dakota (lignite)		3.50		3.50		3.66		3.66
Tennessee	4.25	3.56	3.11	4.08	4.18	3.66	3.04	4.02
Utah	6.35			6.35	5.28			5.28
Virginia	4.62	4.18	4.29	4.60	5.02	3.90	3.96	4.92
Washington	7.00	6.90		6.99	7.27	7.12		7.26
West Virginia	4.80	3.65	3.80	4.70	5.41	4.21	4.33	5.29
Wyoming	5.69	2.57		4.05	5.94	2.51		3.89
Total	4.86	3.48	3.60	4.50	5.20	3.74	4.17	4.82

TABLE 56.—Production and average value per ton, f. o. b. mines, sold in open market and not sold in open market, 1956, by States

State	Production (net tons)			Average value per ton, f. o. b. mines		
	Sold in open market	Not sold in open market	Total	Sold in open market	Not sold in open market	Total
Alabama	4,623,344	8,040,000	12,663,344	$5.04	$6.97	$6.26
Alaska	724,266	2,535	726,801	8.77	8.71	8.77
Arizona	4,500	5,560	10,060	5.11	7.74	6.56
Arkansas	590,049	42	590,091	7.80	6.40	7.80
California (lignite)		12,000	12,000		10.00	10.00
Colorado	2,278,773	1,223,390	3,502,163	4.90	7.08	5.66
Georgia	8,471		8,471	5.00		5.00
Illinois	47,077,826	1,024,215	48,102,041	3.86	3.12	3.84
Indiana	17,084,790	4,643	17,089,433	3.75	3.04	3.75
Iowa	1,358,250		1,358,250	3.48		3.48
Kansas	883,852	25	883,877	4.36	6.00	4.36
Kentucky	68,086,346	6,468,682	74,555,028	4.27	6.31	4.44
Maryland	668,875		668,875	4.01		4.01
Missouri	3,278,399	4,579	3,282,978	4.03	2.55	4.03
Montana:						
Bituminous	382,751	437,514	820,265	5.15	3.20	4.11
Lignite	25,869		25,869	3.70		3.70
Total Montana	408,620	437,514	846,134	5.06	3.20	4.10
New Mexico	137,412	21,032	158,444	5.80	6.00	5.82
North Dakota (lignite)	2,532,110	283,064	2,815,174	2.35	2.24	2.34
Ohio	35,573,983	3,359,574	38,933,557	3.91	2.82	3.82
Oklahoma	1,535,785	471,202	2,006,987	5.56	8.06	6.15
Pennsylvania	54,423,168	35,863,524	90,286,692	4.85	6.01	5.31
South Dakota (lignite)	24,519		24,519	3.66		3.66
Tennessee	8,640,892	206,878	8,847,770	4.00	4.89	4.02
Utah	3,422,163	3,100,001	6,522,164	4.94	5.65	5.28
Virginia	27,926,372	136,403	28,062,775	4.92	5.14	4.92
Washington	449,765	22,855	472,620	7.20	8.50	7.26
West Virginia	138,117,597	17,772,852	155,890,449	5.18	6.08	5.29
Wyoming	1,401,869	1,151,511	2,553,380	3.43	4.44	3.89
Total	421,261,996	79,612,081	500,874,077	4.60	5.93	4.82

LIGNITE

TABLE 57.—Summary of number of mines, production, value, men working daily, days operated, number of man-days worked, output per man per day, and detailed operations at underground and strip lignite mines in the United States, 1956, by States [1]

Item	California	Montana	North Dakota	South Dakota	Total
OPERATIONS AT UNDERGROUND MINES					
Number of mines	----------	3	5	----------	8
Shot from solid .... net tons	----------	17,471	5,269	----------	22,740
Cut by machines .... do	----------	----------	3,743	----------	3,743
Total production .... do	----------	17,471	9,012	----------	26,483
Number of cutting machines	----------	----------	2	----------	2
Average output per machine .... net tons	----------	----------	1,872	----------	1,872
Underground production cut by machine .... percent	----------	----------	41.5	----------	14.1
Average value per ton	----------	$3.83	$3.61	----------	$3.76
Average number of men working daily	----------	18	16	----------	34
Average number of days worked	----------	129	119	----------	124
Number of man-days worked	----------	2,323	1,907	----------	4,230
Average tons per man per day	----------	7.52	4.73	----------	6.26
OPERATIONS AT STRIP MINES					
Number of strip mines	1	5	39	1	46
Production .... net tons	12,000	8,398	2,806,162	24,519	2,851,079
Average value per ton	$10.00	$3.43	$2.33	$3.66	$2.38
Number of shovels and draglines	2	4	52	3	61
Average number of men working daily	3	13	382	9	407
Average number of days worked	178	104	208	279	206
Number of man-days worked	535	1,356	79,421	2,510	83,822
Average tons per man per day	22.43	6.19	35.33	9.77	34.01
TOTAL OPERATIONS AT ALL LIGNITE MINES					
Number of mines	1	8	44	1	54
Production (net tons):					
Shipped by rail [2]	----------	----------	2,159,662	----------	2,159,662
Shipped by truck or wagon	----------	25,835	387,420	24,519	437,774
Used at mines [3]	12,000	34	268,092	----------	280,126
Total	12,000	25,869	2,815,174	24,519	2,877,562
Average value per ton	$10.00	$3.70	$2.34	$3.66	$2.39
Average number of men working daily	3	31	398	9	441
Average number of days worked	178	119	204	279	200
Number of man-days worked	535	3,679	81,328	2,510	88,052
Average tons per man per day	22.43	7.03	34.62	9.77	32.68

[1] Exclusive of Texas (lignite).
[2] Includes coal loaded at mines directly into railroad cars and hauled by trucks to railroad sidings.
[3] Includes coal transported from mines to point of use by conveyor belts or trams, used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, made into beehive coke at mines, and all other uses at mines.

FOREIGN TRADE[4]

Imports of bituminous coal and lignite are very small, although exports have been an important item of foreign trade for many years, particularly since the close of World War II. A detailed analysis of exports and imports of bituminous coal and lignite is shown in Mineral Yearbook, volume II, 1953, pp. 146–150.

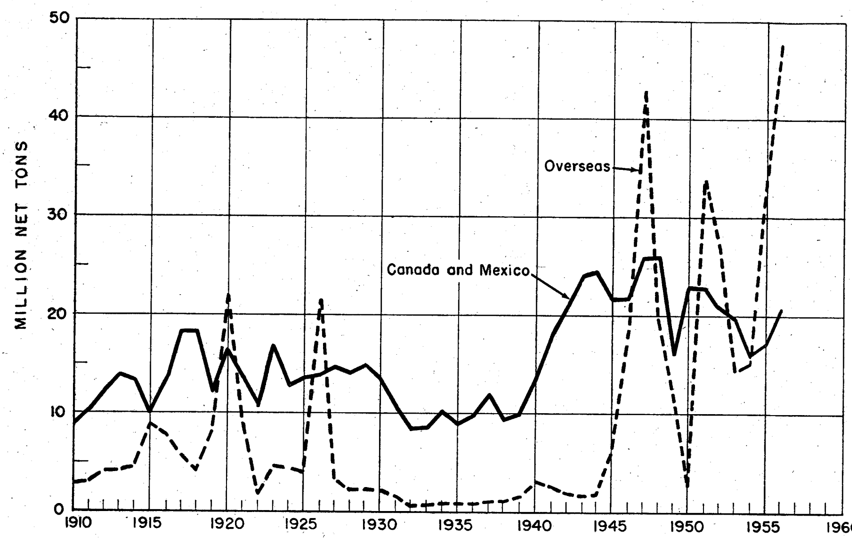

FIGURE 15.—Exports of bituminous coal and lignite from the United States to Canada and Mexico and overseas, 1910–56.

TABLE 58.—Bituminous coal[1] imported for consumption in the United States, 1954–56, by countries and customs districts, in net tons

[Bureau of the Census]

	1954	1955	1956
COUNTRY			
North America: Canada	198,799	337,145	353,899
Europe: Germany, West			1,802
Total	198,799	337,145	355,701
CUSTOMS DISTRICT			
Alaska		370	260
Buffalo	876		
Duluth and Superior	1,197	89	90
Hawaii	606		
Maine and New Hampshire	126,430	187,540	212,119
Michigan		53	
Montana and Idaho	69,192	148,045	137,264
New York			386
North Carolina			355
St. Lawrence			64
Washington	498	1,048	5,163
Total	198,799	337,145	355,701

[1] Includes slack, culm, and lignite.

[4] Figures on imports and exports compiled by M. B. Price and E. D. Page, of the Bureau of Mines, from records of the Bureau of the Census, U. S. Department of Commerce.

TABLE 59.—Exports of bituminous coal, by country groups, 1947–51 (average) and 1952–56, in thousand net tons

[Bureau of the Census]

Year	Canada (including Newfoundland) and Mexico	West Indies and Central America [1]	Overseas (all other countries): Miquelon, Bermuda, and Greenland	South America	Europe	Asia	Africa	Oceania	Total overseas	Grand total
1947–51 (average)	22,821	191	10	1,974	18,051	901	931	47	21,914	44,926
1952	20,984	77	7	2,280	20,672	3,053	541	29	26,582	47,643
1953	19,626	69	2	1,747	8,312	3,915	89		14,065	33,760
1954	15,964	58	(2)	1,385	10,471	3,049	114		15,019	31,041
1955	17,232	51	6	1,447	[3] 28,677	3,726	[3] 138		[3] 33,994	[3] 51,277
1956	20,705	40	2	2,821	41,156	3,509	313		47,801	68,546

[1] Includes Bahamas and Panama.
[2] Less than 1,000 tons.
[3] Revised figure.

TABLE 60.—Bituminous coal exported from the United States, 1953–56, by countries, in net tons [1]

[Bureau of the Census]

Country	1953	1954	1955	1956
North America:				
Bermuda	1,779	595	1,911	2,350
Canada	19,584,135	15,910,572	[2] 17,185,204	20,654,885
Central America:				
Costa Rica	20		25	125
El Salvador	95	140		245
Guatemala	181	150	290	1,032
Honduras	253	25	90	50
Other Central America	27		25	
Greenland			4,485	
Mexico	42,278	52,915	46,548	50,059
Miquelon and St. Pierre	315			
West Indies:				
British:				
Jamaica	12,528	14,451	12,631	5,468
Trinidad and Tobago	15,325	2,566	3,398	1,975
Other British	5			
Cuba	36,626	39,278	30,804	27,863
Dominican Republic	55	75	75	548
French	4,259	1,303	3,304	2,249
Haiti	15		150	
Total North America	19,697,896	16,022,070	[2] 17,288,940	20,746,849
South America:				
Argentina	553,693	8,795	64,743	1,512,436
Bolivia	14,123		13,538	14,454
Brazil	812,804	1,073,991	1,115,433	969,383
Chile	271,053	214,379	139,285	222,819
Surinam	1,969	4,413	2,689	
Uruguay	93,278	83,066	111,433	101,634
Other South America	62	101	50	116
Total South America	1,746,982	1,384,745	1,447,171	2,820,842

See footnotes at end of table.

TABLE 60.—Bituminous coal exported from the United States, 1953–56, by countries, in net tons [1]—Continued

[Bureau of the Census]

Country	1953	1954	1955	1956
Europe:				
Austria	67,069	421,543	809,807	1,353,150
Belgium-Luxembourg	644,303	265,118	1,142,452	1,858,989
Denmark	6,399	224,622	357,752	363,954
Finland		9,284	188,772	421,773
France	373,946	68,861	1,016,888	6,589,043
Germany, West	3,135,255	1,383,979	[2] 6,678,504	10,243,077
Gibraltar			22,355	23,663
Greece		30,849	151,934	127,613
Iceland	3,980		6,417	7,180
Italy	1,884,241	3,542,830	6,056,130	7,556,640
Netherlands	1,238,026	1,944,583	[2] 4,641,931	6,593,850
Norway	99,980	206,827	459,956	392,258
Portugal	10,336	41,849	76,317	204,153
Spain	46,417	275,236	433,096	358,707
Sweden	53,479	429,676	656,223	903,947
Switzerland	196,152	194,186	58,552	266,989
Trieste	105,767	242,511	378,709	501,088
United Kingdom		461,091	4,850,677	2,754,117
Yugoslavia	446,270	728,193	690,284	636,302
Total Europe	8,311,620	10,471,238	[2] 28,676,756	41,156,493
Asia:				
Indonesia	32,683	14,536	45,409	47,695
Israel	1,620	1,290	795	2,259
Japan	3,873,888	2,921,144	2,760,495	3,178,329
Korea, Republic of		111,608	919,129	280,257
Pakistan	6,273			25
Other Asia	609		32	325
Total Asia	3,915,073	3,048,578	3,725,860	3,508,890
Africa:				
Algeria	10,916			58,097
Angola		56,462	65,302	128,763
Belgian Congo	22,276	16,409	21,033	
Canary Islands			12,830	8,375
Egypt	44,525	30,519	31,772	49,454
Ethiopia		10,543		10,894
French Morocco				22,316
Libya				14,416
Maderia Island			1,680	4,149
Tunisia				11,340
Other Africa	10,975		5,912	5,412
Total Africa	88,692	113,933	138,529	313,216
Grand total	33,760,263	31,040,564	[2] 51,277,256	68,546,290

[1] Amounts stated do not include fuel or bunker coal loaded on vessels engaged in foreign trade, which aggregated 605,019 tons in 1953, 427,072 tons in 1954, 444,806 tons in 1955, and 498,967 tons in 1956.
[2] Revised figure.

TABLE 61.—Bituminous coal exported from the United States, 1953–56, by customs districts, in net tons

[Bureau of the Census]

Customs district	1953	1954	1955	1956
North Atlantic:				
Maine and New Hampshire	3,843	5,790	13,296	1,383
Massachusetts		3,608	47	2,274
New York	148	297	4,072	1,675
Philadelphia	24,636	17,787	201,844	464,432
South Atlantic:				
Maryland	1,621,147	627,921	[1] 3,643,684	4,789,671
Virginia	12,384,828	14,262,824	[1] 29,398,882	42,152,242
Gulf Coast:				
Florida	17	49		
Galveston			119	77
Mobile	147,701	234,389	648,862	241,002
New Orleans	970	260	43,473	155
Sabine		1,781		
Mexican border:				
Arizona	119	64	105	88
El Paso	27,131	9,263	272	2,038
Laredo	408	28	327	180
Pacific Coast:				
Los Angeles	10,251	5,600	33,187	
Oregon			20,157	
San Diego	25	50	76	
San Francisco			43,615	
Washington	23,283	2,030	67,413	426
Northern border:				
Buffalo	850,784	603,415	460,188	346,235
Chicago	759,546	640,837	891,817	1,081,059
Dakota	44,705	43,675	30,967	16,866
Duluth and Superior	47,854	37,228	61,209	171,942
Michigan	2,676,464	2,064,034	1,995,191	1,152,505
Minnesota			53	
Montana and Idaho	1,255	593	298	286
Ohio	11,629,093	9,538,246	[1] 10,682,968	11,871,058
Rochester	2,018,576	1,737,287	[1] 1,964,639	2,773,170
St. Lawrence	1,451,990	1,132,094	983,437	738,873
Vermont	1,835	1,444	1,326	
Miscellaneous:				
Alaska	4		205	
Pittsburgh			11,117	
Total [2]	33,760,263	31,040,564	[1] 51,277,256	68,546,290

[1] Revised figure.
[2] Includes 33,650 tons in 1953, 69,970 tons in 1954, 74,410 tons in 1955, and 2,738,653 tons in 1956, representing estimated data for which district breakdown is not available.

TABLE 62.—Shipments of bituminous coal to possessions and other areas administered by the United States, 1954–56 [1]

[Bureau of the Census]

Territory	1954		1955		1956	
	Net tons	Value	Net tons	Value	Net tons	Value
Guam			(2)	$104	(2)	$657
Puerto Rico	8,287	$105,492	(2)	80,980	(2)	108,902
Virgin Islands	4,507	37,228	(2)	100		

[1] Data cover "coal and related fuels."
[2] Quantity not recorded.

WORLD PRODUCTION

The United States supplied 546 million tons of bituminous coal, anthracite, and lignite, or 29 percent of the world output, in 1956.

Production in most coal-producing countries of Europe increased slightly in 1956; however, consumption requirements of the principal coal-producing countries in Europe exceeded available supplies. Production from the United States supplied most of the deficit.

TABLE 63.—World production of bituminous coal, anthracite, and lignite, by countries, 1952–56, in thousand short tons [1]

[Compiled by Pearl J. Thompson]

Country	1952	1953	1954	1955	1956 [2]
North America:					
Canada:					
Bituminous	15,495	13,879	12,798	12,524	12,571
Lignite	2,083	2,022	2,116	2,294	2,342
Greenland: Bituminous	8	[3] 8	[3] 8	[3] 8	[3] 8
Mexico: Bituminous	1,452	1,579	1,448	1,479	1,552
United States:					
Anthracite (Pennsylvania)	40,583	30,949	29,083	26,205	28,900
Bituminous	463,823	454,439	389,157	461,468	497,996
Lignite	3,017	2,851	2,843	3,166	2,878
Total	526,461	505,727	437,453	507,144	546,247
South America:					
Argentina: Bituminous	125	91	103	150	164
Brazil: Bituminous (including lignite)	2,161	2,232	2,265	2,500	2,461
Chile: Bituminous (mined)	2,697	2,575	2,499	2,544	2,493
Colombia: Bituminous	1,070	1,357	1,653	2,039	2,205
Peru: Bituminous and anthracite	248	231	174	93	93
Venezuela: Bituminous	28	32	35	33	34
Total	6,329	6,518	6,729	7,359	7,450
Europe:					
Albania: Lignite [3]	90	120	170	220	255
Austria:					
Bituminous	209	179	195	188	183
Lignite	5,709	6,144	6,928	7,296	7,419
Belgium: Bituminous and anthracite	33,493	33,135	32,241	33,045	32,579
Bulgaria:					
Anthracite [3]	33	33	33	33	33
Lignite (including bituminous) [3]	8,130	8,800	9,500	11,000	11,800
Czechoslovakia:					
Bituminous	22,400	22,400	23,800	24,400	25,800
Lignite	36,800	37,900	40,700	44,900	48,600
Denmark: Lignite	1,405	880	754	839	[3] 1,300
France:					
Bituminous and anthracite	61,029	57,977	59,981	60,996	60,768
Lignite	2,194	2,147	2,105	2,263	2,487
Germany:					
Bituminous and anthracite:					
East	3,885	2,910	2,920	2,940	3,025
West	137,570	138,509	142,233	145,250	149,427
Lignite:					
East	174,715	190,480	200,525	221,135	226,910
West	92,095	93,355	96,795	99,601	104,986
Pech coal: West	1,898	1,855	1,905	2,003	1,979
Greece: Lignite	282	489	772	862	992
Hungary:					
Bituminous	1,894	2,197	2,684	2,967	2,619
Lignite	18,570	20,962	21,055	21,632	20,077
Ireland: Bituminous and anthracite	183	184	215	222	[3] 240
Italy:					
Bituminous and anthracite	1,200	1,247	1,184	1,251	1,188
Lignite	940	836	710	459	441
Netherlands:					
Bituminous	13,814	13,555	13,306	13,112	13,213
Lignite	259	278	190	281	298
Poland:					
Bituminous	93,076	97,776	100,972	104,142	104,884
Lignite	5,595	6,173	6,504	6,663	6,816
Portugal:					
Bituminous and anthracite	487	527	476	445	456
Lignite	85	78	72	97	161
Rumania:					
Bituminous and anthracite [3]	440	440	440	440	550
Lignite [3]	4,300	6,300	6,300	6,400	6,600
Saar: Bituminous	17,896	18,098	18,539	19,103	18,838
Spain:					
Bituminous and anthracite	13,519	13,663	13,891	13,917	14,198
Lignite	1,764	1,974	1,933	2,024	2,148
Svalbard (Spitzbergen): Bituminous [4]	778	761	686	697	761
Sweden: Bituminous	383	314	294	311	324
Switzerland: Bituminous and anthracite (incl. lignite) [3]	11	11	11	11	11

For footnotes, see end of table.

TABLE 63.—World production of bituminous coal, anthracite, and lignite, by countries, 1952–56, in thousand short tons [1]—Continued

Country	1952	1953	1954	1955	1956 [2]
Europe—Continued					
U. S. S. R.:					
Bituminous and anthracite	237, 007	247, 265	268, 612	304, 941	334, 772
Lignite	94, 651	105, 940	114, 010	126, 348	138, 340
United Kingdom: Bituminous and anthracite	253, 669	251, 110	250, 942	248, 188	248, 645
Yugoslavia:					
Bituminous	1, 114	1, 020	1, 089	1, 253	1, 358
Lignite	12, 221	11, 377	13, 972	15, 510	17, 493
Total [3]	1, 355, 800	1, 399, 400	1, 459, 650	1, 547, 400	1, 613, 000
Asia:					
Afghanistan: Bituminous	13	18	17	25	26
China: Bituminous, anthracite, and lignite	70, 000	73, 400	88, 100	102, 700	116, 100
India: Bituminous	40, 659	40, 298	41, 310	42, 813	44, 162
Indonesia: Bituminous	1, 057	989	992	897	912
Iran: Bituminous [5]	165	171	278	270	116
Japan:					
Bituminous and anthracite	47, 795	51, 292	47, 088	46, 763	51, 318
Lignite	1, 696	1, 638	1, 592	1, 508	1, 676
Korea:					
Anthracite:					
North [3]	850	1, 100	1, 200	1, 300	1, 500
Republic of	635	956	982	1, 442	2, 003
Lignite:					
North [3]	440	440	660	2, 200	2, 860
Republic of	2				
Malaya: Bituminous	353	321	251	230	204
Pakistan: Bituminous	671	654	621	608	722
Philippines: Bituminous	153	171	132	143	168
Taiwan (Formosa): Bituminous	2, 520	2, 638	2, 329	2, 600	2, 788
Thailand (Siam): Lignite	4	1	7	44	96
Turkey (mined):					
Bituminous	5, 342	6, 232	6, 299	6, 070	5, 909
Lignite	1, 529	1, 809	2, 315	2, 663	3, 762
U. S. S. R., including Sakhalin, southern: Bituminous	(6)	(6)	(6)	(6)	(6)
Vietnam, North: Anthracite	948	978	1, 099	1, 213	1, 213
Total [3]	174, 830	183, 110	195, 280	213, 490	235, 540
Africa:					
Algeria: Bituminous and anthracite	297	325	334	333	335
Belgian Congo: Bituminous	279	347	418	529	463
French Morocco: Anthracite	507	623	536	515	531
Madagascar: Bituminous	4	6	1		
Mozambique: Bituminous	127	179	157	191	240
Nigeria: Bituminous	650	785	712	839	882
Rhodesia and Nyasaland, Federation of Southern Rhodesia: Bituminous	2, 821	2, 887	3, 029	3, 654	3, 918
Union of South Africa: Bituminous (marketable)	30, 935	31, 371	32, 314	35, 436	37, 040
Total	35, 620	36, 523	37, 501	41, 497	43, 409
Oceania:					
Australia:					
Bituminous	21, 734	20, 620	22, 134	21, 588	21, 605
Lignite	9, 076	9, 248	10, 451	11, 326	11, 827
New Zealand:					
Bituminous and anthracite	966	868	912	877	897
Lignite	2, 114	1, 954	1, 994	1, 985	2, 046
Total	33, 890	32, 690	35, 491	35, 776	36, 375
Other countries (estimate)	110	110	110	110	110
World total all grades (estimate)	2, 133, 000	2, 164, 100	2, 172, 200	2, 352, 800	2, 482, 100
Lignite (total of items shown above) (estimate)	479, 770	514, 200	544, 970	592, 720	624, 680
Bituminous and anthracite (by subtraction)	1, 653, 230	1, 649, 900	1, 627, 230	1, 760, 080	1, 857, 420

[1] This table incorporates a number of revisions of data published in previous Coal chapters. Data do not add to totals shown due to rounding where estimated figures are included in the detail.
[2] Preliminary.
[3] Estimate.
[4] Includes the following quantities, in thousand short tons, produced in U. S S. R.-controlled mines: 1952, 279; 1953, 290; 1954, 311; 1955, 342; and 1956, 330 (estimated).
[5] Year ended March 20 of year following that stated.
[6] Output from U. S. S. R. in Asia included with U. S. S. R. in Europe.

COAL TECHNOLOGY

In 1956 contributions to research on coal were made by the Bureau of Mines; Bituminous-Coal Research, Inc.; Illinois State Geological Survey; Pennsylvania, Utah, and West Virginia State Universities; Virginia Polytechnic Institute; and many other independent research institutions, equipment manufacturers, Government agencies, and research groups supported by coal companies and working on problems of particular interest to the company.

The importance of coal research to the economic stability of the industry was highlighted by the introduction of legislation for a full and complete congressional study to determine whether a cooperative coal-research venture could be undertaken in which the Federal Government, interested and affected State governments, industry, labor organizations, and private corporations could participate. Renewed congressional interest in coal research followed an intensive study of the current status of coal research in the United States and abroad by the Bureau of Mines in cooperation with Bituminous-Coal Research, Inc. This study, published as Bureau of Mines Information Circular 7754, entitled, "Outlook and Research Possibilities for Bituminous Coal," reviewed the economic position of the bituminous-coal industry, projected the future demands that would be made on the coal industry in supplying the Nation's energy requirements for the next several decades, and listed research projects that merit study to improve the position of coal in the energy field.

A major advance in the open-pit method of mining coal was the successful construction and operation of the world's largest power shovel. Equipped with a dipper having a capacity of 60 cubic yards, the unit removes earth and rock overburden, averaging 90 feet in depth, to expose a 4½-foot coal bed. Orders have been placed for a larger shovel equipped with a 70-cubic-yard bucket.

Auger mining of coal continued to expand. More than 8 million tons of coal was recovered by this novel method in 1956—an increase of approximately 2 million tons over 1955. Under favorable conditions mining with augers may be highly productive, although the percentage of recovery is not outstanding. From the standpoint of conservation, the use of augers is advantageous to recover coal from exposed seams in high walls of stripping operations, from abandoned underground workings adjacent to strip mines, and in areas where geological conditions preclude the recovery of coal by other mining methods.

In cooperation with the Bureau of Mines, a coal producer in the Pacific Northwest placed in operation the first modern feldspar jig in the United States. Although the feldspar jig has been used extensively in other coal-producing countries to wash the fine sizes of coal, the Pacific Northwest unit is unique in the coal-preparation industry of this country. Based upon preinstallation studies, the feldspar jig was shown to be capable of efficient operation with a high capacity per unit of space.

A thermal drying system for subjecting fine coal to hot, fluid combustion gases was developed to handle coal as much as 1½ inches by

0 in. size. The dried, coarse coal is collected at the level where the wet feed is introduced into the drier, whereas the very fine mesh sizes are carried upward with the drying gases and collected in dry cyclones.

Several major developments in 1956 improved the safety of miners underground. A method was developed for applying a slurry of rock dust on the ribs and roof. Wet rock dust adheres closely to the rib and roof surfaces, and its use permits rapid advance of the continuous-mining machine into the coal bed without subjecting the ventilating system to airborne, dry rock dust. To provide better lighting underground, particularly in face areas, safe lighting fixtures were developed that give high light intensity and distribute the light uniformly, drawing power from the mine circuits. Promising advances were made in the use of electronics to predict rock falls. As roof falls are responsible for more fatalities in coal mines than all other causes combined, better methods for detecting unsafe roof conditions would do much to improve the safety of underground workers.

To overcome the failure of wet, fine coal to flow freely from storage bins, a storage system for bulk solids was developed that would permit satisfactory flow of coal under various conditions of moisture content, bin loading, and discharge rates.

During 1956, efficiencies at electric-utility powerplants were increased through improvements in boiler design and the use of higher steam temperatures and pressures for thermal-power generation.

A condensate-corrosion tester was developed that indicated deterioration in the condensate line under operating conditions and evaluated the effectiveness of chemical treatment in reducing corrosion in condensate return lines of steam heating plants.

The Bureau of Mines and the Texas Power & Light Co. continued to cooperate in operating the Bureau-designed prototype carbonizer at Rockdale, Tex., the characteristics of samples of light oil and tar were studied.

Investigations were begun on the possibility of using the heat of nuclear reaction to gasify coal. Studies were made in an electrically heated experimental unit of suitable materials for constructing the reactor-fuel elements, effect of slag erosion on materials proposed for nuclear fuel-element cladding, effect of geometric design of fuel elements on flow of slag, and optimum operating conditions.

Coke made from Australian brown coal was used successfully as a metallurgical fuel in 1956. The brown coal was made into briquets, then subjected to hot gases, resulting in a gradual rise in temperature to 850° C., then gradually cooled. The brown-coal coke revealed higher mechanical strength than imported metallurgical coke. Construction of a pilot plant is planned to produce 11 tons of brown coke daily from 25 tons of briquets.

Successful adaptation of the Lurgi high-pressure gasification process to extracting gas and chemical byproducts from Australian coal of lignitic rank was reported. Brown-coal briquets are gasified to yield a Lurgi gas having a calorific value of 450 B. t. u. per cubic foot. Refinery gas is added to increase the heating value to 500 B. t. u. per foot, and the enriched gas is piped to Melbourne, a distance of 70 miles.

In Utah a flotation plant for recovering resin compounds from coal was placed in operation. Coal slurry from the washery is fed to 2 flotation units of 4 cells each. The rough concentrate from these units is relayed to a third flotation unit comprising 6 cells. In the 6-cell unit the first 4 cells prepare a cleaner concentrate, and the last 2 cells produce the finished resin concentrate. Before being loaded into railroad cars for shipment, the resin concentrate is dried in a vacuum filter.

Coal—Pennsylvania Anthracite

By J. A. Corgan, J. A. Vaughan, and Marian I. Cooke

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GENERAL SUMMARY

PENNSYLVANIA ANTHRACITE produced in 1956 totaled 28.9 million tons—a 10-percent increase over 1955. The increased output was attributable almost entirely to a sharp expansion (303 percent) in overseas export markets, as the net gain in apparent consumption in the United States amounted to only 2 percent, and the quantity exported to Canada declined 3 percent below 1955. As a result of the stronger demand for anthracite and easing of the pressure from abnormally high stocks held in ground storage at the mines, prices f. o. b. mine increased slightly during the year. Consequently, the total revenue received for all shipments exceeded that of 1955 by 15 percent, and the average price increased from $7.86 per net ton in 1955 to $8.19.

Anthracite produced underground increased 4 percent over 1955 but furnished only 52 percent of the year's total output, compared with 55 percent in 1955 because of an abrupt rise in the output of coal from culm and silt banks. The quantity recovered from banks increased 49 percent—17 percent of the total output compared with but 12 percent in 1955. The sharply increased production of bank coal was also reflected in the percentage of the year's total contributed by stripping operations. Despite a quantitative increase of 8 percent in strip production, strip-pit coal accounted for 29 percent of the 1956 production total, whereas in 1955 it supplied 30 percent. The quantity obtained by dredging fell from 3 percent in 1955 to 2 percent of the total output in 1956.

The average number of men working on active, or productive, days continued to decline, but output increased. In 1956, 31,516 men were reported working daily—far below the 43,996 men working as recently as 1954. Declining employment and concurrently increasing production resulted in a substantial increase in output per man-day, from the record 4.02 tons per man-day produced in 1954 to 4.25 tons. Anthracite operations were active for 216 days, compared with 164 days in54. 19 Of the total 1956 labor force, 48 percent were employed in the Wyoming region, an increase of 5 percent over 1955; 36 percent in the Schuylkill, a decrease of 18 percent; and 16 percent in the Lehigh, a decrease of 5 percent. Underground mines employed 55 percent of the labor force in 1956 and strip pits 15 percent; the remaining 30 percent were reported working in preparation plants and shops, on culm and silt banks, and in other surface occupations.

The number of loading machines reported in use dropped 14 percent, but the tonnage mechanically loaded in underground mines reached 48.5 percent of the total underground production—a new record—exceeding 1955 output by 10 percent. See tables 1–3 for summary data on the Pennsylvania anthracite industry.

TABLE 1.—Salient statistics of the Pennsylvania anthracite industry, 1952–56

	1952	1953	1954	1955	1956
Production:					
Loaded at mines for shipment outside producing region:					
Breakers and washeries..net tons..	35, 116, 657	26, 316, 762	24, 021, 867	21, 250, 344	23, 581, 689
Dredges.....do....	310, 964	299, 799	654, 410	752, 580	688, 379
Sold to local trade by employees net tons..	4, 228, 430	3, 711, 235	3, 798, 919	3, 782, 366	4, 288, 532
Used at collieries for power and heat net tons..	926, 507	621, 356	608, 281	419, 264	341, 620
Total production.....do....	40, 582, 558	30, 949, 152	29, 083, 477	26, 204, 554	28, 900, 220
Value at breaker, washery, or dredge......	$379,714,076	$299,139,687	$247,870,023	$206,096,662	$236,785,062
Average sales realization per net ton on breaker and washery shipments to points outside producing region:					
Domestic.....	$13. 07	$13. 31	$11. 67	$10. 83	$11. 50
Steam.....	$5. 60	$6. 37	$5. 83	$5. 05	$5. 31
Total all sizes.....	$9. 58	$9. 87	$8. 76	$8. 00	$8. 33
Percentage of total breaker and washery shipments to points outside producing region:					
Domestic.....	53. 2	50. 4	50. 1	51. 0	48. 8
Steam.....	46. 8	49. 6	49. 9	49. 0	51. 2
Producers' stocks at end of year [1] net tons..	1, 708, 887	1, 915, 919	1, 292, 922	719, 569	341, 505
Exports [2].....do....	4, 592, 060	2, 724, 270	2, 851, 239	3, 152, 313	5, 244, 349
Imports [2].....do....	29, 370	31, 443	5, 831	170	46
Consumption (apparent).....do....	35, 300, 000	28, 000, 000	26, 900, 000	23, 600, 000	24, 000, 000
Average number of days worked.....	201	163	164	[3] 197	216
Average number of men working daily....	65, 923	57, 862	43, 996	[3] 33, 523	31, 516
Output per man per day.....net tons..	3. 06	3. 28	4. 02	[3] 3. 96	4. 25
Output per man per year.....do....	615	535	659	[3] 780	918
Quantity cut by machines.....do....	386, 128	318, 699	381, 424	393, 932	400, 402
Quantity mined by stripping.....do....	10, 696, 705	8, 606, 482	7, 939, 680	7, 703, 907	8, 354, 230
Quantity loaded by machines underground.....net tons..	10, 034, 464	6, 838, 769	6, 978, 035	6, 660, 939	7, 308, 110
Distribution:					
Total receipts in New England [4] net tons..	2, 887, 640	2, 106, 343	1, 897, 283	1, 718, 404	1, 619, 605
Exports to Canada [2].....do....	3, 606, 618	2, 601, 818	2, 456, 747	2, 434, 981	2, 356, 351
Loaded into vessels at Lake Erie [5] net tons..	478, 534	263, 705	283, 922	467, 886	588, 085
Receipts at Duluth-Superior [6]...do....	226, 956	81, 678	94, 835	170, 754	321, 432

[1] Anthracite Committee.
[2] U. S. Department of Commerce.
[3] Estimated.
[4] Commonwealth of Massachusetts, Division on the Necessaries of Life, and Association of American Railroads.
[5] Ore and Coal Exchange, Cleveland, Ohio.
[6] U. S. Engineer Office, Duluth, Minn.

SCOPE OF REPORT

The terms "Pennsylvania anthracite", or "anthracite" as used in this chapter refer specifically to the anthracitic or "hard" coal found in the northeastern part of Pennsylvania. As the anthracitic coals of Arkansas, Colorado, New Mexico, Virginia, and Washington are classified officially as semianthracites, the data pertaining to them are included in the production totals for bituminous coal and lignite in the Bituminous Coal and Lignite chapter of the Bureau of Mines Minerals Yearbook. A small tonnage of semianthracite produced in Sullivan County, Pa., is included in the total production of Pennsylvania anthracite because of the county's location with respect to the Northern anthracite field.

Anthracite is produced from four distinct sources—underground mines, strip pits, culm banks, and dredges (operating in creeks and rivers). Each producer is canvassed annually for data on run-of-mine production, the names of plants to which the raw coal was sold or transferred for preparation, the number and types of mechanical equipment employed, and other data related to mining or recovery. However, as only a small part of the total production is sold for use without preparation, the production data in this chapter represent, except where noted otherwise, the cleaned and sized output of preparation plants and dredges, expressed in terms of the short or net ton of 2,000 pounds.

To eliminate duplicate reporting and to insure complete coverage on the output of cleaned and sized coal, each report received from a producer of run-of-mine or run-of-bank material is checked with that of the preparation plant processing the material for market. There are no transfers of raw dredge coal as operators of dredges recover and clean and size all their raw coal production. Data thus compiled represent virtually the entire annual production. The small percentage on which no direct reports are received is estimated by the Bureau of Mines on the basis of collateral data released by the Anthracite Committee and the Pennsylvania Department of Mines and Mineral Industries.

The anthracite-producing region of Pennsylvania (referred to in this chapter also as the "local sales" area, or "the region") is divided into three regions, the Wyoming, Lehigh, and Schuylkill. The area also is separated by geologic conditions into four producing fields, the Northern (the coal measures of which underlie a surface area of 176 square miles), Eastern Middle (33 square miles), Western Middle (94 square miles), and the Southern (181 square miles). Therefore, most of the data in this chapter relative to production are presented by regions, fields, counties, and sources (underground, strip, culm bank, and dredge).

Previously, data on Pennsylvania anthracite production have been published separately by type of preparation plant—breakers, washeries, and dredges. The term "washery" in recent years has lost its significance because, by definition, this type of plant is usually equipped only to process culm-bank material. The term "breaker" connoted a plant equipped to break or crush run-of-mine material and process it into a cleaned and sized product. Because of the growing demand for the fine sizes of anthracite, an increasing proportion of the

TABLE 2.—Statistical summary of monthly developments in the Pennsylvania anthracite industry in 1956

(All tonnage figures represent net tons)

	January	February	March	April	May	June	July	August	September	October	November	December	Year 1956	Change from 1955 (percent)	Year 1955
Production (including mine fuel, local sales, and dredge coal)	2,743,000	2,360,000	2,052,000	2,258,000	1,947,000	2,470,000	1,890,000	2,729,000	2,509,000	2,971,000	2,629,000	2,342,000	28,900,000	+10.3	26,205,000
Shipments (breakers and washeries only, all sizes):															
By rail [1]	1,923,252	1,612,924	1,394,898	1,496,641	1,490,385	1,891,662	1,429,519	1,997,457	1,910,143	2,234,346	1,965,062	1,704,162	21,050,451	+7.4	19,591,824
By truck [2]	942,179	720,342	803,064	739,923	625,020	578,731	465,182	565,324	681,298	719,587	718,066	693,631	8,252,347	+2.5	8,050,298
Carloadings [3]	37,293	31,856	26,408	28,896	27,348	35,699	27,280	39,269	36,229	42,831	38,090	31,941	403,140	+7.7	374,452
Distribution:															
Lake Erie loadings [4]	-----	-----	-----	19,976	56,359	47,219	62,493	123,255	104,473	108,391	65,919	-----	588,085	+25.7	467,886
Lake Ontario loadings [5]	-----	-----	-----	-----	-----	-----	-----	-----	697	-----	-----	-----	697	−83.7	4,285
Receipts at Duluth-Superior [6]	-----	-----	-----	10,610	9,316	21,687	40,315	57,027	81,165	70,706	20,773	-----	311,599	+82.5	170,754
Upper Lake dock trade: [7]															
Receipts:															
Lake Superior	-----	56	-----	10,665	9,316	1,857	12,133	25,537	39,213	54,318	30,608	-----	183,703	+70.3	107,845
Lake Michigan	2,666	2,876	1,109	14,924	9,846	8,799	8,279	27,183	11,776	11,822	11,528	2,732	113,540	−34.6	173,549
Deliveries (reloadings):															
Lake Superior	15,844	10,374	4,219	2,727	9,568	16,111	3,199	13,884	18,184	28,851	17,137	14,012	154,110	+7.1	143,932
Lake Michigan	15,437	12,292	11,743	6,478	13,028	13,235	10,643	7,635	11,637	11,989	10,222	8,988	133,327	−23.7	174,722
New England receipts:															
Tidewater [3]	-----	-----	-----	-----	-----	7,491	1,622	-----	-----	270	-----	-----	9,383	+81.6	5,167
Rail [8]	172,963	121,161	86,594	98,438	122,518	161,386	137,933	130,385	133,574	165,558	169,956	109,756	1,610,222	−6.0	1,713,237
Exports [9]	389,923	331,456	231,294	244,136	333,969	404,624	359,499	465,024	680,068	658,584	487,621	658,151	5,244,349	+66.4	3,152,313
Imports [9]	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	46	46	−72.9	170
Industrial consumption and stocks:															
Railroads (Class 1 only): [3]															
Consumption	54,126	47,850	47,802	35,280	30,473	22,740	17,732	20,429	22,290	33,666	36,000	41,106	409,494	−10.5	457,349
Stocks	28,205	23,289	19,926	23,616	25,158	35,524	37,487	39,637	39,134	38,750	39,499	42,669	42,669	+7.7	39,617
Electric utilities: [10]															
Consumption	287,849	259,109	287,478	244,063	261,179	275,518	248,033	277,400	272,405	299,272	282,576	301,034	3,295,916	+2.7	3,209,218
Stocks	3,043,571	2,936,308	2,821,617	2,810,245	2,833,509	2,832,429	2,824,036	2,841,617	2,852,951	2,866,210	2,863,192	2,809,167	2,809,167	−11.2	3,163,048
Stocks on Upper Lake docks: [7]															
Lake Superior	37,766	28,380	24,069	31,911	31,178	16,924	25,839	36,373	57,268	82,655	96,126	81,990	81,990	+51.6	54,067
Lake Michigan	56,249	46,833	37,498	45,341	42,159	37,723	35,359	54,907	55,046	54,879	56,185	51,928	51,928	−24.8	69,020
Producers' stocks [11]	555,168	432,770	425,344	430,600	370,781	281,500	333,743	528,646	519,292	387,945	363,716	341,505	341,505	−52.5	719,569
Stocks in retail dealer yards [12]	1,121,000	989,000	692,000	801,000	991,000	1,295,000	1,399,000	1,487,000	1,459,000	1,614,000	1,608,000	1,498,000	1,498,000	+25.9	1,190,0000
Retail dealer deliveries [13]	1,617,000	1,372,000	1,509,000	1,010,000	814,000	915,000	830,000	770,000	1,021,000	988,000	1,043,000	1,129,000	13,018,000	[14]	13,019,000

Wholesale price indexes (1947–49=100): [15]															
F. o. b. mines:															
Chestnut	124.0	124.0	124.0	109.4	109.4	109.4	113.0	113.0	114.6	120.7	127.2	136.7	118.8	+4.4	113.8
Pea	111.6	111.6	111.6	100.6	100.6	100.6	105.1	105.1	106.2	109.1	114.3	124.2	108.4	−0.3	108.7
Buckwheat No. 1	144.6	144.6	144.6	130.2	130.2	130.2	133.4	133.4	134.3	137.8	145.2	162.2	238.9	−1.1	140.4
Buckwheat No. 3	145.5	145.5	145.5	141.3	141.3	141.3	145.4	145.4	147.9	151.3	157.1	163.3	147.3	+2.1	144.2
Employee wages and hours: [15]															
Average weekly earnings	$91.96	$85.58	$71.32	$80.34	$70.66	$88.63	$92.20	$87.25	$87.88	$94.87	$91.19	$108.04	$87.65	+3.7	$84.50
Average hourly earnings	$2.62	$2.57	$2.52	$2.60	$2.42	$2.63	$2.59	$2.62	$2.60	$2.68	$2.69	$2.96	$2.64	+4.3	$2.53
Average number hours worked per week	35.1	33.3	28.3	30.9	29.2	33.7	35.6	33.3	33.8	35.4	33.9	36.5	33.2	−0.6	33.4

[1] Furnished by Anthracite Institute.
[2] Pennsylvania Department of Mines.
[3] Association of American Railroads.
[4] Ore and Coal Exchange, Cleveland, Ohio.
[5] Buffalo Branch, Ore and Coal Exchange, Cleveland, Ohio.
[6] U. S. Engineer Office, Duluth, Minn.
[7] Includes all commercial docks on Lake Superior and west shore of Lake Michigan as far south as Kenosha. Based on data courteously supplied by Maher Coal Bureau and direct reports to the Bureau of Mines.
[8] Furnished by Commonwealth of Massachusetts, Division on the Necessaries of Life.
[9] U. S. Department of Commerce.
[10] Federal Power Commission.
[11] Anthracite Committee. Represents coal in ground storage on nearest available date to end of month.
[12] Estimated from reports submitted by a selected list of retail dealers.
[13] Estimated from reports submitted by a selected list of retail dealers. Does not include local sales.
[14] Less than 0.05 percent.
[15] Bureau of Labor Statistics.

TABLE 3.—Historical statistics of the Pennsylvania anthracite industry, 1890–1956

Year	Production (net tons)	Value of production	Average value per net ton	Exports [1] (net tons)	Imports [1] (net tons)	Apparent consumption [2] (net tons)	Average number of employees	Average number of days worked	Average tons per man per day	Average tons per man per year	Quantity cut by machines [3] (net tons)	Quantity produced by stripping [4] (net tons)	Quantity loaded mechanically underground [5] (net tons)
1890	46,468,641	$66,383,772	$1.43	889,655	16,962	45,596,000	126,000	200	1.85	369			
1891	50,665,431	73,944,735	1.46	964,601	42,120	49,743,000	126,350	203	1.98	401			
1892	52,472,504	82,442,000	1.57	953,836	72,865	51,592,000	129,050	198	2.06	407			
1893	53,967,543	85,687,078	1.59	1,493,281	60,220	52,534,000	132,944	197	2.06	406			
1894	51,921,121	78,488,063	1.51	1,613,500	100,876	50,408,000	131,603	190	2.08	395			
1895	57,999,337	82,019,272	1.41	1,647,195	158,297	56,510,000	142,917	196	2.07	406			
1896	54,346,081	81,748,651	1.50	1,512,000	113,892	52,948,000	148,991	174	2.10	365			
1897	52,611,681	79,301,954	1.51	1,454,620	27,478	51,185,000	149,884	150	2.34	351			
1898	53,382,645	75,414,537	1.41	1,513,062	3,527	51,873,000	145,504	152	2.41	367			
1899	60,418,005	88,142,130	1.46	1,912,732	68	58,505,000	139,608	173	2.50	433			
1900	57,367,915	85,757,851	1.49	1,853,163	132	55,515,000	144,206	166	2.40	398			
1901	67,471,667	112,504,020	1.67	2,232,504	320	65,239,000	145,309	196	2.37	464			
1902	41,373,595	76,173,586	1.84	1,016,934	190,636	40,547,000	148,141	116	2.40	279			
1903	74,607,068	152,036,448	2.04	2,249,920	196,837	72,554,000	150,483	206	2.41	496			
1904	73,156,709	138,974,020	1.90	2,495,799	81,232	70,742,000	155,861	200	2.35	469			
1905	77,659,850	141,879,000	1.83	2,497,581	38,350	75,201,000	165,406	215	2.18	470			
1906	71,282,411	131,917,694	1.85	2,483,005	36,236	68,836,000	162,355	195	2.25	439			
1907	85,604,312	163,584,056	1.91	3,021,841	11,085	82,594,000	167,234	220	2.33	512			
1908	83,268,754	158,178,849	1.90	3,082,641	18,462	80,205,000	174,174	200	2.39	478			
1909	81,070,359	149,181,587	1.84	3,183,840	3,574	77,890,000	[6] 171,195	205	[7] 2.31	[7] 474			
1910	84,485,236	160,275,302	1.90	3,384,222	9,180	81,110,000	169,497	229	2.17	498			
1911	90,464,067	175,189,392	1.94	3,980,479	2,759	86,486,000	172,585	246	2.13	524	69,907		
1912	84,361,598	177,622,626	2.11	4,131,444	1,870	80,232,000	174,030	231	2.10	485	246,216		
1913	91,524,922	195,181,127	2.13	4,652,912	1,004	85,474,000	175,745	257	2.02	520	555,776		
1914	90,821,507	188,181,399	2.07	4,289,873	17,696	84,041,000	179,679	245	2.06	505	916,596		
1915	88,995,061	184,653,498	2.07	3,965,255	814	88,144,000	176,552	230	2.19	504	1,307,756	1,121,603	
1916	87,578,493	202,009,561	2.31	4,665,530	6,000	87,118,000	159,869	253	2.16	548	1,839,506	1,987,800	
1917	99,611,811	283,650,723	2.85	6,007,306	13,000	94,068,000	154,174	285	2.27	646	1,955,223	2,301,588	
1918	98,826,084	336,480,347	3.40	4,967,808	37,272	92,775,000	147,121	293	2.29	672	1,857,514	2,360,183	
1919	88,092,201	364,926,950	4.14	4,976,598	82,818	81,518,000	154,571	266	2.14	570	1,575,205	2,006,879	
1920	89,598,249	434,252,198	4.85	5,403,749	31,748	85,786,000	145,074	271	2.28	618	938,073	2,054,441	
1921	90,473,451	452,304,903	5.00	4,677,368	8,894	81,950,000	159,499	271	2.09	567	979,145	2,027,790	
1922	54,683,022	273,700,125	5.01	2,649,457	233,528	56,799,000	156,849	151	2.31	349	502,793	949,745	
1923	93,339,009	506,786,768	5.43	5,090,138	300,360	86,914,000	157,743	268	2.21	592	1,208,542	2,263,098	
1924	87,926,862	477,230,852	5.43	4,017,785	117,951	80,717,000	160,009	274	2.00	550	1,423,884	1,865,677	
1925	61,817,149	327,664,512	5.30	3,179,006	382,894	64,061,000	160,312	182	2.12	386	941,189	1,578,478	
1926	84,437,452	474,164,252	5.62	4,029,683	813,956	77,221,000	165,386	244	2.09	511	931,650	2,401,356	
1927	80,095,564	420,941,726	5.26	3,325,507	119,030	74,672,000	165,259	225	2.15	485	1,171,888	2,153,156	[6] 2,223,281
1928	75,348,069	393,637,690	5.22	3,336,272	384,707	73,650,000	160,681	217	2.17	469	1,289,809	2,422,924	[6] 2,351,074
1929	73,828,195	385,642,751	5.22	3,406,369	487,172	71,457,000	151,501	225	2.16	487	1,159,910	1,911,766	3,470,158
1930	69,384,837	354,574,191	5.11	2,551,659	674,812	67,628,000	150,804	208	2.21	460	1,410,123	2,536,288	4,467,750

1931	59,645,652	296,354,586	4.97	1,778,308	637,951	58,408,000	139,431	181	2.37	428	1,587,265	3,813,237	4,384,780
1932	49,855,221	222,375,129	4.46	1,303,355	607,097	50,500,000	121,243	162	2.54	411	1,674,223	3,980,973	5,433,340
1933	49,541,344	206,718,405	4.17	1,034,562	456,252	49,600,000	104,633	182	2.60	473	1,648,249	4,932,069	6,557,267
1934	57,168,291	244,152,245	4.27	1,297,610	478,118	55,500,000	109,050	207	2.53	524	1,981,088	5,798,138	9,284,486
1935	52,158,783	210,130,565	4.03	1,608,549	571,439	51,100,000	103,269	189	2.68	505	1,848,095	5,187,072	9,279,057
1936	54,579,535	227,003,538	4.16	1,678,024	614,639	53,200,000	102,081	192	2.79	535	2,162,744	6,203,267	10,827,946
1937	51,856,433	197,598,849	3.81	1,914,173	395,737	50,400,000	99,085	189	2.77	523	1,984,512	5,696,018	10,683,837
1938	46,099,027	180,600,167	3.92	1,908,911	362,895	45,200,000	96,417	171	2.79	478	1,588,407	5,095,341	10,151,669
1939	51,487,377	187,175,324	3.64	2,590,000	298,153	49,700,000	93,138	183	3.02	553	1,881,884	5,486,479	11,773,833
1940	51,484,640	205,489,814	3.99	2,667,632	135,436	49,000,000	91,313	186	3.02	562	1,816,483	6,352,700	12,326,000
1941	[8] 56,368,267	240,275,126	4.26	3,380,189	74,669	52,700,000	88,054	203	[9] 3.04	617	1,855,422	7,316,574	13,441,987
1942	[8] 60,327,729	271,673,380	4.50	4,438,588	140,115	56,500,000	82,121	239	[9] 2.95	705	2,285,640	9,070,933	14,741,459
1943	[8] 60,643,620	306,816,018	5.06	4,138,680	166,020	57,100,000	79,153	270	[9] 2.78	751	1,624,883	8,989,387	14,745,793
1944	[8] 63,701,363	354,582,884	5.57	4,185,933	11,847	59,400,000	77,591	292	[9] 2.79	815	1,336,082	10,953,030	14,975,146
1945	[8] 54,933,909	323,944,435	5.90	3,691,247	149	51,600,000	72,842	269	[9] 2.79	751	1,210,171	10,056,325	13,927,955
1946	[8] 60,506,873	413,417,070	6.83	6,497,245	9,556	53,900,000	78,145	271	[9] 2.84	770	1,232,828	12,858,930	15,619,162
1947	[8] 57,190,009	413,019,486	7.22	8,509,995	10,350	48,200,000	78,600	259	[9] 2.78	720	1,209,983	12,603,545	16,054,011
1948	[8] 57,139,948	467,051,800	8.17	6,675,914	945	50,200,000	76,215	265	[9] 2.81	745	1,016,757	13,352,874	15,742,368
1949	[8] 42,701,724	358,008,451	8.38	4,942,670	----------	37,700,000	75,377	195	[9] 2.87	560	557,599	10,376,808	11,858,088
1950	[8] 44,076,703	392,398,006	8.90	3,891,569	18,289	39,900,000	72,624	211	[9] 2.83	597	611,734	11,833,934	12,335,650
1951 [10]	42,669,997	405,817,963	9.51	5,955,535	26,812	37,000,000	68,995	208	2.97	618	496,085	11,135,990	10,847,787
1952	40,582,558	379,714,076	9.36	4,592,060	29,370	35,300,000	65,923	201	3.06	615	386,128	10,696,705	10,034,464
1953	30,949,152	299,139,687	9.67	2,724,270	31,443	28,000,000	57,862	163	3.28	535	318,699	8,606,482	6,838,769
1954	29,083,477	247,870,023	8.52	2,851,239	5,831	26,900,000	43,996	164	4.02	659	381,424	7,939,680	6,978,035
1955	26,204,554	206,096,662	7.86	3,152,313	170	23,600,000	[11] 33,523	[11] 197	[11] 396	[11] 780	393,932	7,703,907	6,660,939
1956	28,900,220	236,785,062	8.19	5,244,349	46	24,000,000	31,516	216	425	918	400,402	8,354,230	7,308,110

[1] U. S. Department of Commerce.
[2] Before 1913 the figures of consumption take no account of producers' stocks, as no data are available for this item.
[3] Data first collected in 1911.
[4] Data first collected in 1915.
[5] Data first collected in 1929.
[6] As reported by the Commonwealth of Pennsylvania, Department of Mines.
[7] Calculated on basis of Pennsylvania Department of mines employment data.
[8] Includes some "bootleg" coal purchased by authorized operators and prepared at their breakers.
[9] Output per man calculated on authorized tonnages only; bootleg purchases excluded.
[10] Figures for 1951 and subsequent years are not strictly comparable with previous years. See Production and Employment sections, Coal—Pennsylvania Anthracite, Minerals Yearbook, 1951.
[11] Estimated.

culm-bank coal has been prepared in breakers. In addition, some washeries have begun processing silt and fine sizes of fresh-mined coal purchased from other plants. Because of this lack of distinction between breakers and washeries, the output of all cleaning or processing plants except dredges is shown as a single total identified as "breakers and washeries" or "preparation plants."

Because of seasonal and market variations in demand for the various sizes of anthracite, producers frequently place some sizes in ground storage temporarily in order to continue producing those sizes finding a ready market. To obtain accurate production data, each respondent is requested to include all coal produced and shipped into but not out of storage. The originating railroads also follow the same procedure in reporting carloadings to the Association of American Railroads, which, in turn, makes the figures available to the Bureau of Mines for use in preparing weekly and monthly estimates of production. For a description of the methods used in collecting and processing distribution data on Pennsylvania anthracite, see the Distribution section of this chapter.

ACKNOWLEDGMENTS

In compiling the wide variety of statistical data appearing in this chapter on the Pennsylvania anthracite industry, free use has been made of statistical information published or released by many sources. The Anthracite Committee, the Anthracite Institute, the Pennsylvania Department of Mines and Mineral Industries, the Association of American Railroads, the Ore and Coal Exchange, and the Commonwealth of Massachusetts are but a few that have cooperated in supplying data to the Bureau of Mines. To each the Bureau expresses its sincere thanks.

The production data for 1956 were collected, edited, and tabulated by Ruth A. Cooper and Kathryn S. Huling under the direction of C. S. Kuebler, director, Bureau of Mines Anthracite Experiment Station, Schuylkill Haven, Pa.

PRODUCTION, MINING METHODS, AND EQUIPMENT [1]

Stimulated by a 2-percent rise in apparent consumption in the United States and 303-percent increase in exports to countries other than Canada, production of Pennsylvania anthracite from all sources totaled 28.9 million tons in 1956 and exceeded that of 1955 by 10 percent. While still low, the increased production did occasion some optimism in the industry, as 1956 was the first year since 1950 to show an increase over the preceding year.

Tables 4 to 9, present detailed data on production by fields, regions, and counties of origin. As the coalfields of Sullivan County are contiguous to those producing anthracite, 6,702 tons of semianthracite produced in the Bernice basin are included in the regular production statistics. Total shipments of anthracite, expressed in terms of percentages of each size shipped, are shown in tables 10 to 12. As indicated in the Scope of Report section of this chapter, production of

[1] For a detailed description of the underground, strip, culm-bank, and dredging methods employed in producing Pennsylvania anthracite, refer to the Coal—Pennsylvania Anthracite chapter of Bureau of Mines Minerals Yearbook, 1953.

and shipments from breakers and washeries have been combined for the first time in 1956. Therefore, to provide comparable historical data, tables 1, 4, 10, 11, 24, and 25 have been compiled to reflect this combination for 1952–56. Figure 1 shows graphically shipments from the Lehigh, Schuylkill, and Wyoming regions for 1935–56.

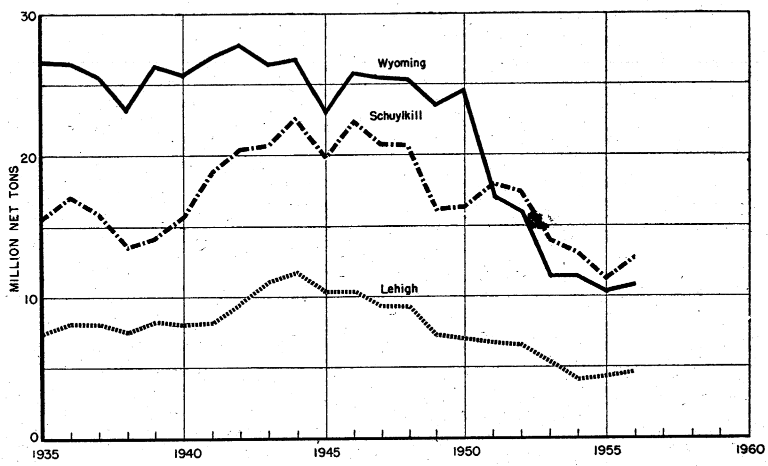

FIGURE 1.—Pennsylvania anthracite shipped from the Lehigh, Schuylkill, and Wyoming regions, 1935–56.

TABLE 4.—Pennsylvania anthracite produced, 1952–56, by fields, in net tons

Field	1952	1953	1954	1955	1956
Eastern Middle:					
Breakers and washeries	2,945,505	2,541,375	2,514,873	2,409,794	2,391,906
Western Middle:					
Breakers and washeries	11,783,093	8,882,129	7,911,794	6,527,929	7,268,150
Dredges	62,696	46,884	83,547	52,169	46,348
Total Western Middle	11,845,789	8,929,013	7,995,341	6,580,098	7,314,498
Southern:					
Breakers and washeries	8,979,129	7,352,970	5,952,615	5,958,776	7,425,427
Dredges	304,243	380,339	635,371	712,724	625,310
Total Southern	9,283,372	7,733,309	6,587,986	6,671,500	8,050,737
Northern:					
Breakers and washeries	16,478,722	11,717,270	11,961,914	10,509,309	11,091,748
Dredges	5,115	10,958	6,989	23,950	44,629
Total Northern	16,483,837	11,728,228	11,968,903	10,533,259	11,136,377
Total, excluding Sullivan County:					
Breakers and washeries	40,186,449	30,493,744	28,341,196	25,405,808	28,177,231
Dredges	372,054	438,181	725,907	788,843	716,287
Total, excluding Sullivan County	40,558,503	30,931,925	29,067,103	26,194,651	28,893,518
Sullivan County: [1] Breakers	24,055	17,227	16,374	9,903	6,702
Grand total	40,582,558	30,949,152	29,083,477	26,204,554	28,900,220

[1] For purposes of historical comparison and statistical convenience, the mines of Sullivan County are grouped with the Pennsylvania anthracite region, although the product is classified as semianthracite according to the American Society for Testing Materials Tentative Standard.

TABLE 5.—Pennsylvania anthracite shipped outside producing region, sold locally, and used as colliery fuel in 1956, by regions

Region	Shipments outside region		Local sales		Colliery fuel		Total	
	Net tons	Value [1]	Net tons	Value	Net tons	Value	Net tons	Value [1]
Lehigh:								
Breakers and washeries	4,446,797	$32,052,202	313,227	$3,203,933	53,858	$336,614	4,813,882	$35,592,749
Dredges	44,262	161,019					44,262	161,019
Total Lehigh	4,491,059	32,213,221	313,227	3,203,933	53,858	336,614	4,858,144	35,753,768
Schuylkill:								
Breakers and washeries	10,455,880	79,467,567	1,767,534	15,060,797	48,187	286,515	12,271,601	94,814,879
Dredges	599,488	878,369	27,683	99,750	225	390	627,396	978,509
Total Schuylkill	11,055,368	80,345,936	1,795,217	15,160,547	48,412	286,905	12,898,997	95,793,388
Wyoming:								
Breakers and washeries	8,675,623	84,796,299	2,176,785	19,088,814	239,340	1,161,864	11,091,748	105,046,977
Dredges	44,629	133,887					44,629	133,887
Total Wyoming	8,720,252	84,930,186	2,176,785	19,088,814	239,340	1,161,864	11,136,377	105,180,864
Total, excluding Sullivan County:								
Breakers and washeries	23,578,300	196,316,068	4,257,546	37,353,544	341,385	1,784,993	28,177,231	235,454,605
Dredges	688,379	1,173,275	27,683	99,750	225	390	716,287	1,273,415
Total	24,266,679	197,489,343	4,285,229	37,453,294	341,610	1,785,383	28,893,518	236,728,020
Sullivan County:								
Breakers	3,389	23,334	3,303	33,598	10	110	6,702	57,042
Grand total:								
1956	24,270,068	197,512,677	4,288,532	37,486,892	341,620	1,785,493	28,900,220	236,785,062
1955	22,002,924	171,777,276	3,782,366	32,306,542	419,264	2,012,844	26,204,554	206,096,662
Change, percent	+10.3	+15.0	+13.4	+16.0	−18.5	−11.3	+10.3	+14.9

[1] Value given for shipments is value at which coal left possession of producing company and does not include margins of separately incorporated sales companies.

TABLE 6.—Pennsylvania anthracite produced in 1956, classified as fresh-mined, culm-bank, and river coal, by regions, in net tons

Region	From mines			From culm banks	From river dredging	Total
	Underground		Strip pits			
	Mechanically loaded	Hand loaded				
Lehigh	187, 169	1, 471, 370	1, 661, 962	1, 493, 381	44, 262	4, 858, 144
Schuylkill	846, 561	4, 311, 386	4, 362, 816	2, 750, 838	627, 396	12, 898, 997
Wyoming	6, 274, 380	1, 964, 038	2, 322, 750	530, 580	44, 629	11, 136, 377
Total, excluding Sullivan County	7, 308, 110	7, 746, 794	8, 347, 528	4, 774, 799	716, 287	28, 893, 518
Sullivan County			6, 702			6, 702
Grand total	7, 308, 110	7, 746, 794	8, 354, 230	4, 774, 799	716, 287	28, 900, 220

TABLE 7.—Pennsylvania anthracite produced in 1956, classified as fresh-mined, culm-bank, and river coal, by fields, in net tons

Field	From mines			From culm banks	From river dredging	Total
	Underground		Strip pits			
	Mechanically loaded	Hand loaded				
Eastern Middle	162, 762	161, 229	1, 008, 045	1, 059, 870		2, 391, 906
Western Middle	453, 802	2, 417, 797	2, 883, 749	1, 512, 802	46, 348	7, 314, 498
Southern	417, 166	3, 203, 730	2, 132, 984	1, 671, 547	625, 310	8, 050, 737
Northern	6, 274, 380	1, 964, 038	2, 322, 750	530, 580	44, 629	11, 136, 377
Total, excluding Sullivan County	7, 308, 110	7, 746, 794	8, 347, 528	4, 774, 799	716, 287	28, 893, 518
Sullivan County			6, 702			6, 702
Grand total	7, 308, 110	7, 746, 794	8, 354, 230	4, 774, 799	716, 287	28, 900, 220

TABLE 8.—Pennsylvania anthracite shipped in 1956, by regions and sizes

Size	From breakers and washeries								
	Lehigh region			Schuylkill region			Wyoming region		
	Outside region	Local sales	Total	Outside region	Local sales	Total	Outside region	Local sales	Total
NET TONS									
Lump[1] and Broken	1,077		1,077	9,600	1,129	10,729	17,579	40,295	57,874
Egg	38,391	386	38,777	113,274	2,700	115,974	140,896	3,473	144,369
Stove	578,824	4,050	582,874	1,467,142	190,455	1,657,597	2,206,240	42,097	2,248,337
Chestnut	697,266	53,761	751,027	1,749,078	396,565	2,145,643	2,485,522	264,462	2,749,984
Pea	349,662	96,583	446,245	896,640	343,003	1,239,643	745,659	674,579	1,420,238
Total Pea and larger	1,665,220	154,780	1,820,000	4,235,734	933,852	5,169,586	5,595,896	1,024,906	6,620,802
Buckwheat No. 1	436,584	47,533	484,117	1,282,369	281,086	1,563,455	1,047,082	394,144	1,441,226
Buckwheat No. 2 (Rice)	267,184	78,203	345,387	879,838	240,369	1,120,207	668,897	239,215	908,112
Buckwheat No. 3 (Barley)	380,832	19,775	400,607	1,354,796	203,391	1,558,187	796,443	239,078	1,035,521
Buckwheat No. 4	431,406	1,229	432,635	786,502	31,259	817,761	255,741		255,741
Buckwheat No. 5	441,669		441,669	1,035,050	15,808	1,050,858	64,637	123,113	187,750
Other[2]	823,902	11,707	835,609	881,591	61,769	943,360	246,927	156,329	403,256
Total Buckwheat No. 1 and smaller	2,781,577	158,447	2,940,024	6,220,146	833,682	7,053,828	3,079,727	1,151,879	4,231,606
Grand total	4,446,797	313,227	4,760,024	10,455,880	1,767,534	12,223,414	8,675,623	2,176,785	10,852,408
VALUE									
Lump[1] and Broken	$13,768		$13,768	$117,000	$13,515	$130,515	$231,102	$455,357	$686,459
Egg	445,836	$5,150	450,986	1,351,825	33,177	1,385,002	1,649,185	43,564	1,692,749
Stove	6,913,197	56,165	6,969,362	17,527,237	2,258,209	19,785,446	26,607,472	563,448	27,170,920
Chestnut	8,384,501	734,103	9,118,604	20,752,918	4,735,929	25,488,847	30,388,850	3,540,517	33,929,367
Pea	2,972,971	1,081,592	4,054,563	7,866,994	3,155,714	11,022,708	6,997,414	7,128,634	14,126,048
Total Pea and larger	18,730,273	1,877,010	20,607,283	47,615,974	10,196,544	57,812,518	65,874,023	11,731,520	77,605,543
Buckwheat No. 1	3,165,181	466,504	3,631,685	8,907,684	1,947,004	10,854,688	7,718,782	3,395,600	11,114,382
Buckwheat No. 2 (Rice)	1,829,435	671,214	2,500,649	5,722,181	1,570,970	7,293,151	4,683,299	1,781,455	6,464,754
Buckwheat No. 3 (Barley)	2,048,322	135,916	2,184,238	7,249,677	1,025,504	8,275,181	4,407,676	1,317,021	5,724,697
Buckwheat No. 4	1,807,639	6,461	1,814,100	3,182,898	104,172	3,287,070	1,033,958		1,033,958
Buckwheat No. 5	1,676,628		1,676,628	3,773,017	42,403	3,815,420	234,600	425,867	660,467
Other[2]	2,794,724	46,828	2,841,552	3,016,136	174,200	3,190,336	843,961	437,351	1,281,312
Total Buckwheat No. 1 and smaller	13,321,929	1,326,923	14,648,852	31,851,593	4,864,253	36,715,846	18,922,276	7,357,294	26,279,570
Grand total	32,052,202	3,203,933	35,256,135	79,467,567	15,060,797	94,528,364	84,796,299	19,088,814	103,885,113

AVERAGE VALUE PER TON

Lump[1] and Broken	$12.78	----	$12.78	$12.19	$11.97	$12.16	$13.15	$11.30	$11.86
Egg	11.61	$13.34	11.63	11.93	12.29	11.94	11.70	12.54	11.73
Stove	11.94	13.87	11.96	11.95	11.86	11.94	12.06	13.38	12.08
Chestnut	12.02	13.65	12.14	11.87	11.94	11.88	12.23	13.39	12.34
Pea	8.50	11.20	9.09	8.77	9.20	8.89	9.38	10.57	9.95
Total Pea and larger	11.25	12.13	11.32	11.24	10.92	11.18	11.77	11.45	11.72
Buckwheat No. 1	7.25	9.81	7.50	6.95	6.93	6.94	7.37	8.62	7.71
Buckwheat No. 2 (Rice)	6.85	8.58	7.24	6.50	6.54	6.51	7.00	7.45	7.12
Buckwheat No. 3 (Barley)	5.38	6.87	5.45	5.35	5.04	5.31	5.53	5.51	5.53
Buckwheat No. 4	4.19	5.26	4.19	4.05	3.33	4.02	4.04	----	4.04
Buckwheat No. 5	3.80	----	3.80	3.65	2.68	3.63	3.63	3.46	3.52
Other[2]	3.39	4.00	3.40	3.42	2.82	3.38	3.42	2.80	3.18
Total Buckwheat No. 1 and smaller	4.79	8.37	4.98	5.12	5.83	5.21	6.14	6.39	6.21
Grand total	7.21	10.23	7.41	7.60	8.52	7.73	9.77	8.77	9.57

See footnotes at end of table.

TABLE 8.—Pennsylvania anthracite shipped in 1956, by regions and sizes—Continued

Size	From breakers and washeries—Continued								
	Sullivan County			Total					
				Excluding Sullivan County			Including Sullivan County		
	Outside region	Local sales	Total	Outside region	Local sales	Total	Outside region	Local sales	Total
NET TONS									
Lump [1] and Broken				28,256	41,424	69,680	28,256	41,424	69,680
Egg				292,561	6,559	299,120	292,561	6,559	299,120
Stove				4,252,206	236,602	4,488,808	4,252,206	236,602	4,488,808
Chestnut	533	1,427	1,960	4,931,866	714,788	5,646,654	4,932,399	716,215	5,648,614
Pea	223	908	1,131	1,991,961	1,114,165	3,106,126	1,992,184	1,115,073	3,107,257
Total Pea and larger	756	2,335	3,091	11,496,850	2,113,538	13,610,388	11,497,606	2,115,873	13,613,479
Buckwheat No. 1				2,766,035	722,763	3,488,798	2,766,035	722,763	3,488,798
Buckwheat No. 2 (Rice)	1,718	416	2,134	1,815,919	557,787	2,373,706	1,817,637	558,203	2,375,840
Buckwheat No. 3 (Barley)	915	552	1,467	2,532,071	462,244	2,994,315	2,532,986	462,796	2,995,782
Buckwheat No. 4				1,473,649	32,488	1,506,137	1,473,649	32,488	1,506,137
Buckwheat No. 5				1,541,356	138,921	1,680,277	1,541,356	138,921	1,680,277
Other [2]				1,952,420	229,805	2,182,225	1,952,420	229,805	2,182,225
Total Buckwheat No. 1 and smaller	2,633	968	3,601	12,081,450	2,144,008	14,225,458	12,084,083	2,144,976	14,229,059
Grand total	3,389	3,303	6,692	23,578,300	4,257,546	27,835,846	23,581,689	4,260,849	27,842,538
VALUE									
Lump [1] and Broken				$361,870	$468,872	$830,742	$361,870	$468,872	$830,742
Egg				3,446,846	81,891	3,528,737	3,446,846	81,891	3,528,737
Stove				51,047,906	2,877,822	53,925,728	51,047,906	2,877,822	53,925,728
Chestnut	$5,488	$17,700	$23,188	59,526,269	9,010,549	68,536,818	59,531,757	9,028,249	68,560,006
Pea	2,055	10,100	12,155	17,837,379	11,365,940	29,203,319	17,839,434	11,376,040	29,215,474
Total Pea and larger	7,543	27,800	35,343	132,220,270	23,805,074	156,025,344	132,227,813	23,832,874	156,060,687

Buckwheat No. 1				19, 791, 647	5, 809, 108	25, 600, 755	19, 791, 647	5, 809, 108	25, 600, 755
Buckwheat No. 2 (Rice)	11, 156	3, 000	14, 156	12, 234, 915	4, 023, 639	16, 258, 554	12, 246, 071	4, 026, 639	16, 272, 710
Buckwheat No. 3 (Barley)	4, 635	2, 798	7, 433	13, 705, 675	2, 478, 441	16, 184, 116	13, 710, 310	2, 481, 239	16, 191, 549
Buckwheat No. 4				6, 024, 495	110, 633	6, 135, 128	6, 024, 495	110, 633	6, 135, 128
Buckwheat No. 5				5, 684, 245	468, 270	6, 152, 515	5, 684, 245	468, 270	6, 152, 515
Other [2]				6, 654, 821	658, 379	7, 313, 200	6, 654, 821	658, 379	7, 313, 200
Total Buckwheat No. 1 and smaller	15, 791	5, 798	21, 589	64, 095, 798	13, 548, 470	77, 644, 268	64, 111, 589	13, 554, 268	77, 665, 857
Grand total	23, 334	33, 598	56, 932	196, 316, 068	37, 353, 544	233, 669, 612	196, 339, 402	37, 387, 142	233, 726, 544
AVERAGE VALUE PER TON									
Lump [1] and Broken				$12.81	$11.32	$11.92	$12.81	$11.32	$11.92
Egg				11.78	12.49	11.80	11.78	12.49	11.80
Stove				12.01	12.16	12.01	12.01	12.16	12.01
Chestnut	$10.30	$12.40	$11.83	12.07	12.61	12.14	12.07	12.61	12.14
Pea	9.22	11.12	10.75	8.95	10.20	9.40	8.95	10.20	9.40
Total Pea and larger	9.98	11.91	11.43	11.50	11.26	11.46	11.50	11.26	11.46
Buckwheat No. 1				7.16	8.04	7.34	7.16	8.04	7.34
Buckwheat No. 2 (Rice)	6.49	7.21	6.63	6.74	7.21	6.85	6.74	7.21	6.85
Buckwheat No. 3 (Barley)	5.07	5.07	5.07	5.41	5.36	5.40	5.41	5.36	5.40
Buckwheat No. 4				4.09	3.41	4.07	4.09	3.41	4.07
Buckwheat No. 5				3.69	3.37	3.66	3.69	3.37	3.66
Other [2]				3.41	2.86	3.35	3.41	2.86	3.35
Total Buckwheat No. 1 and smaller	6.00	5.99	6.00	5.31	6.32	5.46	5.31	6.32	5.46
Grand total	6.89	10.17	8.51	8.33	8.77	8.39	8.33	8.77	8.39

See footnotes at end of table.

TABLE 8.—Pennsylvania anthracite shipped in 1956, by regions and sizes—Continued

Size	From river dredging			Grand total		
	Outside region	Local sales	Total	Outside region	Local sales	Total
NET TONS						
Lump [1] and Broken				28,256	41,424	69,680
Egg				292,561	6,559	299,120
Stove				4,252,206	236,602	4,488,808
Chestnut				4,932,399	716,215	5,648,614
Pea	360	194	554	1,992,544	1,115,267	3,107,811
Total Pea and larger	360	194	554	11,497,966	2,116,067	13,614,033
Buckwheat No. 1		252	252	2,766,035	723,015	3,489,050
Buckwheat No. 2 (Rice)				1,817,637	558,203	2,375,840
Buckwheat No. 3 (Barley)	4,782	1,033	5,815	2,537,768	463,829	3,001,597
Buckwheat No. 4	49,527	2,145	51,672	1,523,176	34,633	1,557,809
Buckwheat No. 5	32,230	3,978	36,208	1,573,586	142,899	1,716,485
Other [2]	601,480	20,081	621,561	2,553,900	249,886	2,803,786
Total Buckwheat No. 1 and smaller	688,019	27,489	715,508	12,772,102	2,172,465	14,944,567
Grand total	688,379	27,683	716,062	24,270,068	4,288,532	28,558,600
VALUE						
Lump [1] and Broken				$361,870	$468,872	$830,742
Egg				3,446,846	81,891	3,528,737
Stove				51,047,906	2,877,822	53,925,728
Chestnut				59,531,757	9,028,249	68,560,006
Pea	$1,740	$1,000	$2,740	17,841,174	11,377,040	29,218,214
Total Pea and larger	1,740	1,000	2,740	132,229,553	23,833,874	156,063,427
Buckwheat No. 1		1,402	1,402	19,791,647	5,810,510	25,602,157
Buckwheat No. 2 (Rice)				12,246,071	4,026,639	16,272,710
Buckwheat No. 3 (Barley)	14,099	5,980	20,079	13,724,409	2,487,219	16,211,628
Buckwheat No. 4	160,450	7,744	168,194	6,184,945	118,377	6,303,322
Buckwheat No. 5	124,213	10,357	134,570	5,808,458	478,627	6,287,085
Other [2]	872,773	73,267	946,040	7,527,594	731,646	8,259,240
Total Buckwheat No. 1 and smaller	1,171,535	98,750	1,270,285	65,283,124	13,653,018	78,936,142
Grand total	1,173,275	99,750	1,273,025	197,512,677	37,486,892	234,999,569

AVERAGE VALUE PER TON						
Lump[1] and Broken	---	---	---	$12.81	$11.32	$11.92
Egg	---	---	---	11.78	12.49	11.80
Stove	---	---	---	12.01	12.16	12.01
Chestnut	---	---	---	12.07	12.61	12.14
Pea	$4.83	$5.15	$4.95	8.95	10.20	9.40
Total Pea and larger	4.83	5.15	4.95	11.50	11.26	11.46
Buckwheat No. 1	---	5.56	5.56	7.16	8.04	7.34
Buckwheat No. 2 (Rice)	---	---	---	6.74	7.21	6.85
Buckwheat No. 3 (Barley)	2.95	5.79	3.45	5.41	5.36	5.40
Buckwheat No. 4	3.24	3.61	3.26	4.06	3.42	4.05
Buckwheat No. 5	3.85	2.60	3.72	3.69	3.35	3.66
Other[2]	1.45	3.65	1.52	2.95	2.93	2.95
Total Buckwheat No. 1 and smaller	1.70	3.59	1.78	5.11	6.28	5.28
Grand total	1.70	3.60	1.78	8.14	8.74	8.23

[1] Quantity of Lump included is insignificant.
[2] Includes various mixtures of Buckwheat Nos. 2-5 and 644,280 tons shipped direct to market without preparation.

TABLE 9.—Pennsylvania anthracite produced in 1956, by counties

County	Shipments outside producing regions		Sold to local trade		Colliery fuel		Total production	
	Net tons	Value [1]	Net tons	Value	Net tons	Value	Net tons	Value [1]
Carbon	1,721,957	$13,647,479	88,709	$926,711	12,011	$83,013	1,822,677	$14,657,203
Columbia	702,126	5,673,164	39,308	394,814	1,689	10,132	743,123	6,078,110
Dauphin	158,011	806,772	104,674	742,380			262,685	1,549,152
Lackawanna	2,373,648	22,093,096	577,498	6,118,974	99,775	400,905	3,050,921	28,612,975
Lancaster, Lebanon, Northampton, and Snyder [2]	619,499	951,677	1,140	5,217			620,639	956,894
Luzerne	7,892,102	74,184,681	1,789,762	14,991,077	178,665	994,586	9,860,529	90,170,344
Northumberland	3,108,118	21,470,429	535,318	4,345,240	4,819	31,991	3,648,255	25,847,660
Schuylkill	7,691,218	58,662,045	1,148,820	9,928,881	44,651	264,756	8,884,689	68,855,682
Sullivan	3,389	23,334	3,303	33,598	10	110	6,702	57,042
Total	24,270,068	197,512,677	4,288,532	37,486,892	341,620	1,785,493	28,900,220	236,785,062

[1] Value given for shipments is value at which coal left possession of producing company; does not include margins of separately incorporated sales companies.
[2] Counties producing dredge coal only.

Underground Mines.—Despite the 10-percent gain in total output between 1955 and 1956, the net increase in underground production was only 4 percent, as many producers continued to obtain relatively greater quantities of coal from strip pits and especially from culm and silt banks. Of the 15.1 million tons produced underground in 1956, 11 percent was mined in the Lehigh region, 34 percent in the Schuylkill, and 55 percent in the Wyoming. Underground output decreased 9 percent in the Lehigh region and increased 14 percent and 1 percent in the Schuylkill and Wyoming regions, respectively.

Although the rate of underground-mine closures slackened during the year, the trend toward purchasing more run-of-mine coal for preparation and sale continued strongly, particularly in the Schuylkill region, where mining conditions are more conducive to small-scale operations. Thus a number of companies began producing only run-of-mine coal from properties leased, in many instances, from companies that had withdrawn from active mining to concentrate on the preparation and sale of coal. Tables 6 and 7 include detailed data on the underground production of anthracite.

Strip Pits.—Production of strip-pit coal totaled 8.4 million tons—an increase of approximately 700,000 tons. However, because of the sharp increase in culm-bank output, the percentage of the year's total obtained from stripping operations declined from 30 percent in 1955 to 29 percent in 1956. The Wyoming region increased sharply (19 percent over 1955), the Schuylkill, 10 percent. In the Lehigh region strip production decreased 8 percent under the 1955 level. Fifty percent of the fresh-mined total of the Lehigh region was produced from strip pits, 46 percent of the Schuylkill, and 22 percent of the Wyoming. These data indicate no change in the percentage of fresh-mined coal obtained from strippings in the Lehigh, a decline of 1 percentage point in the Schuylkill, and a gain of 3 points in the Wyoming. Of the 1956 strip total the Schuylkill furnished 52 percent; the

TABLE 10.—Sizes of Pennsylvania anthracite shipped to points outside producing region, 1952–56, by regions, in percent of total

(Excludes dredge coal)

Size	Percent of total shipments									
	Lehigh region					Schuylkill region				
	1952	1953	1954	1955	1956	1952	1953	1954	1955	1956
Lump [1] and Broken	0.3	0.4	0.5	0.2	(2)	0.2	0.1	0.2	0.2	0.1
Egg	1.8	1.2	1.0	1.1	.9	1.8	1.4	1.2	1.1	1.1
Stove	18.6	18.4	18.0	16.3	13.0	15.7	14.7	15.3	15.3	14.0
Chestnut	19.9	19.9	18.6	17.9	15.7	18.5	16.7	17.1	17.3	16.7
Pea	6.6	7.3	7.4	9.5	7.8	7.3	8.0	8.7	8.6	8.6
Total Pea and larger	47.2	47.2	45.5	45.0	37.4	43.5	40.9	42.5	42.5	40.5
Buckwheat No. 1	12.6	12.4	11.8	11.4	9.8	14.0	14.6	13.4	11.8	12.3
Buckwheat No. 2 (Rice)	7.3	8.0	7.7	7.3	6.0	8.8	9.1	8.4	8.7	8.4
Buckwheat No. 3 (Barley)	8.8	9.6	9.0	9.4	8.6	14.5	14.6	14.5	12.6	13.0
Buckwheat No. 4	9.4	8.6	12.2	8.3	9.7	10.7	10.5	8.3	9.3	7.5
Buckwheat No. 5	6.7	7.0	1.0	5.9	10.0	5.8	4.5	4.3	4.6	9.9
Other	8.0	7.2	12.8	12.7	18.5	2.7	5.8	8.6	10.5	8.4
Total Buckwheat No. 1 and smaller	52.8	52.8	54.5	55.0	62.6	56.5	59.1	57.5	57.5	59.5

Size	Wyoming region					Sullivan County				
Lump [1] and Broken	0.3	0.3	0.3	0.2	0.2	----	----	----	----	----
Egg	2.4	2.0	2.7	1.7	1.6	----	----	----	----	----
Stove	28.1	27.1	25.2	26.6	25.4	4.7	4.2	2.2	----	----
Chestnut	29.6	28.0	24.6	27.5	28.7	21.1	24.9	22.3	75.0	15.7
Pea	7.2	7.6	8.1	7.5	8.6	16.2	21.3	18.5	----	6.6
Total Pea and larger	67.6	65.0	60.9	63.5	64.5	42.0	50.4	43.0	75.0	22.3
Buckwheat No. 1	14.4	14.0	12.8	11.7	12.1	11.6	11.5	15.2	25.0	----
Buckwheat No. 2 (Rice)	7.3	7.4	8.9	7.3	7.7	----	----	----	----	50.7
Buckwheat No. 3 (Barley)	7.4	8.3	10.1	9.7	9.2	----	----	41.8	----	27.0
Buckwheat No. 4	1.6	2.6	3.8	3.6	3.0	----	----	----	----	----
Buckwheat No. 5	.1	.5	1.6	.9	.7	----	----	----	----	----
Other	1.6	2.2	1.9	3.3	2.8	46.4	38.1	----	----	----
Total Buckwheat No. 1 and smaller	32.4	35.0	39.1	36.5	35.5	58.0	49.6	57.0	25.0	77.7

Size	Total									
	Excluding Sullivan County					Including Sullivan County				
Lump [1] and Broken	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1
Egg	2.0	1.6	1.8	1.4	1.2	2.0	1.6	1.8	1.4	1.3
Stove	20.9	19.7	19.6	19.8	18.1	20.9	19.7	19.6	19.8	18.0
Chestnut	23.0	21.2	20.3	21.3	20.9	23.0	21.2	20.2	21.3	20.9
Pea	7.1	7.7	8.3	8.3	8.5	7.1	7.7	8.3	8.3	8.5
Total Pea and larger	53.3	50.4	50.2	51.0	48.8	53.2	50.4	50.1	51.0	48.8
Buckwheat No. 1	13.9	14.0	12.9	11.7	11.7	13.9	14.0	12.9	11.7	11.7
Buckwheat No. 2 (Rice)	8.0	8.3	8.5	7.9	7.7	8.0	8.3	8.5	7.9	7.7
Buckwheat No. 3 (Barley)	10.8	11.5	12.0	10.9	10.7	10.9	11.5	12.0	10.9	10.7
Buckwheat No. 4	7.0	7.4	7.1	6.9	6.3	7.0	7.4	7.1	6.9	6.3
Buckwheat No. 5	3.8	3.6	2.7	3.4	6.5	3.8	3.6	2.8	3.4	6.5
Other	3.2	4.8	6.6	8.2	8.3	3.2	4.8	6.6	8.2	8.3
Total Buckwheat No. 1 and smaller	46.7	49.6	49.8	49.0	51.2	46.8	49.6	49.9	49.0	51.2

[1] Quantity of Lump included is insignificant.
[2] Less than 0.05 percent.

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TABLE 11.—Sizes of Pennsylvania anthracite shipped to points inside producing region, 1952–56, by regions, in percent of total

(Excludes dredge coal)

Size	Percent of total shipments									
	Lehigh region					Schuylkill region				
	1952	1953	1954	1955	1956	1952	1953	1954	1955	1956
Lump [1] and Broken	(2)	(2)	(2)	------	------	0.2	0.1	(2)	(2)	0.1
Egg	0.1	0.1	0.1	(2)	.1	.2	.2	.1	.1	.2
Stove	3.3	1.4	1.6	1.4	1.3	8.3	9.7	9.3	13.4	10.7
Chestnut	22.8	18.5	17.8	15.3	17.2	18.5	19.5	17.8	22.4	22.4
Pea	33.0	35.4	35.4	29.6	30.8	21.7	20.1	21.5	18.7	19.4
Total Pea and larger	59.2	55.4	54.9	46.3	49.4	48.9	49.6	48.7	54.6	52.8
Buckwheat No. 1	17.1	16.7	15.7	13.3	15.2	14.1	13.4	14.5	14.5	15.9
Buckwheat No. 2 (Rice)	19.2	21.8	23.1	20.9	25.0	8.5	10.3	11.5	11.2	13.6
Buckwheat No. 3 (Barley)	4.4	5.6	5.9	5.5	6.3	9.0	11.4	10.2	12.8	11.5
Buckwheat No. 4	.1	.5	.4	1.8	.4	15.4	9.7	8.2	5.7	1.8
Buckwheat No. 5	------	------	------	------	------	2.6	2.2	.1	.7	.9
Other	------	------	------	12.2	3.7	1.5	3.4	6.8	.5	3.5
Total Buckwheat No. 1 and smaller	40.8	44.6	45.1	53.7	50.6	51.1	50.4	51.3	45.4	47.2

Size	Wyoming region					Sullivan County				
Lump [1] and Broken	1.0	1.3	1.5	1.9	1.9	------	------	------	------	------
Egg	.1	.2	.1	.3	.2	------	------	------	------	------
Stove	3.1	2.7	2.0	2.5	1.9	8.3	4.0	2.7	------	------
Chestnut	14.4	13.1	11.7	13.0	12.1	30.0	24.0	25.2	14.3	43.2
Pea	31.3	31.7	32.5	32.9	31.0	35.1	20.6	23.9	17.0	27.5
Total Pea and larger	49.9	49.0	47.8	50.6	47.1	73.4	48.6	51.8	31.3	70.7
Buckwheat No. 1	17.1	16.9	16.9	18.2	18.1	13.1	14.6	16.0	20.1	------
Buckwheat No. 2 (Rice)	11.2	11.9	11.4	12.2	11.0	------	------	------	48.6	12.6
Buckwheat No. 3 (Barley)	13.0	13.5	11.9	10.6	11.0	------	------	32.2	------	16.7
Buckwheat No. 4	.1	1.9	2.1	1.4	------	------	------	------	------	------
Buckwheat No. 5	------	4.6	4.5	------	5.6	------	------	------	------	------
Other	8.7	2.2	5.4	7.0	7.2	13.5	36.8	------	------	------
Total Buckwheat No. 1 and smaller	50.1	51.0	52.2	49.4	52.9	26.6	51.4	48.2	68.7	29.3

Size	Total									
	Excluding Sullivan County					Including Sullivan County				
Lump [1] and Broken	0.7	0.9	0.8	1.0	1.0	0.7	0.9	0.9	1.0	1.0
Egg	.1	.2	.1	.2	.1	.2	.2	.1	.2	.2
Stove	4.6	4.6	4.5	6.4	5.5	4.6	4.6	4.5	6.3	5.5
Chestnut	16.4	15.4	14.3	16.6	16.8	16.4	15.4	14.3	16.7	16.8
Pea	28.7	28.7	29.0	27.4	26.2	28.7	28.7	29.0	27.4	26.2
Total Pea and larger	50.5	49.8	48.7	51.6	49.6	50.6	49.8	48.8	51.6	49.7
Buckwheat No. 1	16.3	15.9	16.0	16.4	17.0	16.3	15.9	16.0	16.4	17.0
Buckwheat No. 2 (Rice)	11.2	12.3	12.4	12.7	13.1	11.2	12.3	12.4	12.8	13.1
Buckwheat No. 3 (Barley)	11.0	12.2	10.8	10.8	10.8	10.9	12.2	10.8	10.8	10.8
Buckwheat No. 4	4.5	4.0	4.1	3.0	.8	4.5	4.0	4.0	3.0	.8
Buckwheat No. 5	.7	3.5	2.6	.3	3.3	.7	3.5	2.6	.2	3.2
Other	5.8	2.3	5.4	5.2	5.4	5.8	2.3	5.4	5.2	5.4
Total Buckwheat No. 1 and smaller	49.5	50.2	51.3	48.4	50.4	49.4	50.2	51.2	48.4	50.3

[1] Quantity of Lump included is insignificant.
[2] Less than 0.05 percent.

TABLE 12.—Sizes of Pennsylvania anthracite shipped to points outside and inside producing region in 1956, by regions, in percent of total

(Excludes dredge coal)

Size	Percent of total shipments								
	Lehigh region			Schuylkill region			Wyoming region		
	Shipped outside region	Local sales	Total	Shipped outside region	Local sales	Total	Shipped outside region	Local sales	Total
Lump [1] and Broken	(2)	-------	(2)	0.1	0.1	0.1	0.2	1.9	0.5
Egg	0.9	0.1	0.8	1.1	.2	.9	1.6	.2	1.3
Stove	13.0	1.3	12.2	14.0	10.7	13.6	25.4	1.9	20.7
Chestnut	15.7	17.2	15.8	16.7	22.4	17.6	28.7	12.1	25.4
Pea	7.8	30.8	9.4	8.6	19.4	10.1	8.6	31.0	13.1
Total Pea and larger	37.4	49.4	38.2	40.5	52.8	42.3	64.5	47.1	61.0
Buckwheat No. 1	9.8	15.2	10.2	12.3	15.9	12.8	12.1	18.1	13.3
Buckwheat No. 2 (Rice)	6.0	25.0	7.3	8.4	13.6	9.2	7.7	11.0	8.4
Buckwheat No. 3 (Barley)	8.6	6.3	8.4	13.0	11.5	12.7	9.2	11.0	9.5
Buckwheat No. 4	9.7	.4	9.1	7.5	1.8	6.7	3.0	-------	2.4
Buckwheat No. 5	10.0	-------	9.3	9.9	.9	8.6	0.7	5.6	1.7
Other	18.5	3.7	17.5	8.4	3.5	7.7	2.8	7.2	3.7
Total Buckwheat No. 1 and smaller	62.6	50.6	61.8	59.5	47.2	57.7	35.5	52.9	39.0

Size	Sullivan County			Total					
				Excluding Sullivan County			Including Sullivan County		
Lump [1] and Broken	-------	-------	-------	0.1	1.0	0.2	0.1	1.0	0.2
Egg	-------	-------	-------	1.2	.1	1.1	1.3	.2	1.1
Stove	-------	-------	-------	18.1	5.5	16.1	18.0	5.5	16.1
Chestnut	15.7	43.2	29.3	20.9	16.8	20.3	20.9	16.8	20.3
Pea	6.6	27.5	16.9	8.5	26.2	11.2	8.5	26.2	11.2
Total Pea and larger	22.3	70.7	46.2	48.8	49.6	48.9	48.8	49.7	48.9
Buckwheat No. 1	-------	-------	-------	11.7	17.0	12.5	11.7	17.0	12.5
Buckwheat No. 2 (Rice)	50.7	12.6	31.9	7.7	13.1	8.5	7.7	13.1	8.5
Buckwheat No. 3 (Barley)	27.0	16.7	21.9	10.7	10.8	10.8	10.7	10.8	10.8
Buckwheat No. 4	-------	-------	-------	6.3	.8	5.4	6.3	.8	5.4
Buckwheat No. 5	-------	-------	-------	6.5	3.3	6.0	6.5	3.2	6.0
Other	-------	-------	-------	8.3	5.4	7.9	8.3	5.4	7.9
Total Buckwheat No. 1 and smaller	77.7	29.3	53.8	51.2	50.4	51.1	51.2	50.3	51.1

[1] Quantity of Lump included is insignificant.
[2] Less than 0.05 percent.

Wyoming, 28 percent; and the Lehigh, 20 percent. Table 13 shows data on strip-pit production for selected years in the period 1915–56, and figure 2 the trend in strip production by regions for 1935–56.

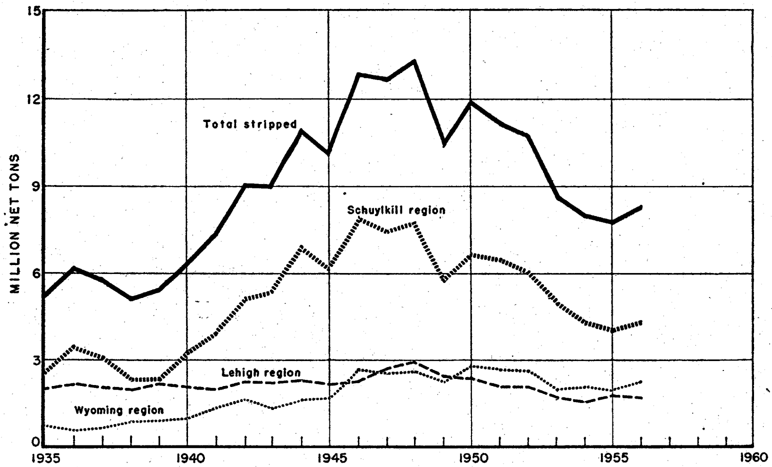

FIGURE 2.—Pennsylvania anthracite mined from strip pits by regions, 1935–56.

TABLE 13.—Production of Pennsylvania anthracite from strip pits, 1915, 1920, 1925, 1930, and 1950–56

	Mined by stripping (net tons)	Percent of fresh-mined total that was stripped	Number of men employed	Average number of days worked
1915	1,121,603	(1)	(1)	(1)
1920	2,054,441	2.5	(1)	(1)
1925	1,578,478	2.7	(1)	(1)
1930	2,536,288	3.7	(1)	(1)
1950	11,833,934	29.6	7,949	212
1951	11,135,990	29.7	7,647	220
1952	10,696,705	30.2	7,100	212
1953	8,606,482	32.5	6,168	193
1954	7,939,680	32.0	4,837	202
1955	7,703,907	34.7	[2] 4,642	[2] 205
1956:				
Lehigh region	1,661,962	50.1	1,199	197
Schuylkill region	4,362,816	45.8	2,436	228
Wyoming region	2,322,750	22.0	1,202	212
Total, excluding Sullivan County	8,347,528	35.7	4,837	216
Sullivan County	6,702	100.0	3	204
Total	8,354,230	35.7	4,840	216

[1] Data not available.
[2] Estimated.

Culm-bank Coal.—Production from culm and silt banks totaled 4.8 million tons in 1956, a 49-percent increase over 1955. Of this total, 58 percent was obtained from banks in the Schuylkill region, 31 percent in the Lehigh, and 11 percent in the Wyoming. Compared with 1955, the 1956 production from banks represented gains of 73 percent in the Lehigh region, 42 percent in the Schuylkill, and 28 percent in the Wyoming. The sharp rise in culm-bank production was due largely to increased demand for the smaller sizes of anthracite in Europe (principally for making fuel briquets) and to the relatively steady increase in demand in the United States where large quantities are used by public utilities as boiler fuel. Also, increased tonnages are being used annually by the metallurgical industries for making iron-ore pellets and sinter and as an admix with bituminous coal for manufacturing metallurgical coke. Detailed data on recovering anthracite from culm and silt banks are shown by fields and regions in tables 6, 7, and 14.

TABLE 14.—Production of Pennsylvania anthracite from culm banks, by regions, 1935–56, in net tons

Year	Lehigh	Schuylkill	Wyoming	Sullivan County	Total
1935	192,790	1,748,960	760,718		2,702,468
1936	136,058	2,532,116	525,798		3,193,972
1937	101,239	2,178,482	442,878		2,722,599
1938	53,037	1,941,896	345,511		2,340,444
1939	64,180	2,159,548	360,086		2,583,814
1940	192,878	2,109,557	480,603		2,783,038
1941	326,755	2,881,049	449,062		3,656,866
1942	745,934	3,529,757	459,373		4,735,064
1943	1,944,047	4,577,917	1,041,841	19,893	7,583,698
1944	2,125,317	5,787,036	1,673,994	13,833	9,600,180
1945	2,086,864	4,936,907	1,728,440	34,448	8,786,659
1946	1,875,590	4,752,141	1,780,874	22,487	8,431,092
1947	1,044,501	3,947,016	1,409,217	2,912	6,403,646
1948	796,114	3,729,542	1,098,123		5,623,779
1949	694,763	2,778,131	956,250		4,429,144
1950	366,069	2,533,535	565,829	1,877	3,467,310
1951	566,613	3,578,795	484,792		4,630,200
1952	791,445	3,407,974	566,097		4,765,516
1953	714,646	2,792,323	504,031		4,011,000
1954	797,761	2,320,006	447,715		3,565,482
1955	862,539	1,934,492	416,015		3,213,046
1956	1,493,381	2,750,838	530,580		4,774,799

Dredge Coal.—In 1956, the production of dredge coal totaled 716,000 tons, a decrease of 9 percent from 1955. The Susquehanna River continued to contribute the largest part of the total, as only 44,000 tons was recovered from the Lehigh and 6,000 tons from the Schuylkill. Production of river (or dredge) coal is shown, by rivers, in tables 15 and 16.

TABLE 15.—Pennsylvania anthracite produced by dredges in 1956, by rivers (including tributaries)

River	Production (net tons)	Value	
		Total	Average
Lehigh	44,262	$161,019	$3.64
Schuylkill	5,540	22,480	4.06
Susquehanna	666,485	1,089,916	1.64
Total	716,287	1,273,415	1.78

TABLE 16.—Pennsylvania anthracite produced by dredges, 1909–56, by rivers (including tributaries)

Year	Net tons				Value	
	Lehigh River	Schuylkill River	Susquehanna River	Total	Total	Average per ton
1909	(1)	(1)	(1)	107,788	(1)	(1)
1910	(1)	(1)	(1)	102,853	(1)	(1)
1911	(1)	(1)	(1)	106,005	(1)	(1)
1912	(1)	(1)	(1)	96,009	(1)	(1)
1913	(1)	(1)	(1)	150,064	(1)	(1)
1914	(1)	(1)	(1)	115,257	(1)	(1)
1915	(1)	(1)	(1)	138,421	$100,744	$0.73
1916	(1)	(1)	(1)	160,507	110,831	.69
1917	(1)	(1)	(1)	170,672	206,754	1.21
1918	(1)	(1)	(1)	282,930	366,565	1.30
1919	(1)	(1)	(1)	693,093	868,746	1.25
1920	(1)	(1)	(1)	740,453	862,296	1.16
1921	(1)	(1)	(1)	623,329	650,654	1.04
1922	(1)	(1)	(1)	904,108	989,709	1.09
Total, 1909–22 [2]	(1)	(1)	(1)	4,391,489	[2] 4,156,299	1.12
1923	106,092	97,254	753,022	956,368	811,065	0.85
1924	80,301	74,359	670,734	825,394	681,181	.83
1925	99,614	173,639	742,455	1,015,708	929,292	.91
1926	58,544	131,654	724,566	914,764	828,398	.91
1927	85,177	127,705	758,935	971,817	794,807	.82
1928	89,304	157,449	696,648	943,401	821,530	.87
1929	87,241	133,720	495,983	716,944	626,187	.87
1930	60,219	138,236	444,836	643,291	538,268	.84
1931	33,014	90,855	334,881	458,750	379,682	.83
1932	42,091	105,990	331,969	480,050	445,799	.93
1933	51,083	106,004	381,837	538,924	452,153	.84
1934	91,346	100,873	459,961	652,180	636,038	.98
1935	78,578	73,326	438,563	590,467	517,304	.88
1936	63,327	31,669	451,688	546,684	581,679	1.06
1937	[3] 95,065	(3)	665,409	760,474	842,052	1.11
1938	[3] 123,452	(3)	447,572	571,024	570,579	1.00
1939	62,134	67,539	574,187	703,860	746,000	1.06
1940	[3] 78,947	(3)	863,997	942,944	1,097,000	1.16
1941	47,838	396,522	1,073,203	1,517,563	1,839,784	1.21
1942	9,385	268,919	1,006,729	1,285,033	1,478,719	1.15
1943	37,452	342,815	954,470	1,334,737	1,972,777	1.48
1944	40,894	494,371	837,472	1,372,737	2,084,431	1.52
1945	41,409	366,161	797,656	1,205,226	1,924,148	1.60
1946	37,441	247,757	847,196	1,132,394	2,091,324	1.85
1947	46,478	158,102	1,015,126	1,219,706	2,480,068	2.03
1948	54,284	67,871	865,849	988,004	2,291,752	2.32
1949	22,131	52,012	790,979	865,122	2,131,096	2.46
1950	21,877	34,222	563,465	619,564	1,677,508	2.71
1951	25,344	27,454	508,770	561,568	1,576,576	2.81
1952	17,402	30,407	324,245	372,054	1,109,778	2.98
1953	31,391	20,643	386,147	438,181	1,449,149	3.31
1954	16,015	----------	709,892	725,907	1,810,026	2.49
1955	29,935	60,256	698,652	788,843	1,844,835	2.34
1956	44,262	5,540	666,485	716,287	1,273,415	1.78
Total, 1923–56	1,909,067	4,183,324	22,283,579	28,375,970	41,334,400	1.46
Grand total	(1)	(1)	(1)	32,767,459	(1)	(1)

1 Data not available.
2 Figures for value cover 1915–22.
3 Schuylkill included with Lehigh in 1937, 1938, and 1940.

Weekly and Monthly Data.—The Bureau of Mines releases estimates of current weekly and monthly anthracite production. Carloadings supplied by the Association of American Railroads, supplemented by factors for truck shipments, colliery fuel, and dredge coal, are used as the bases for the estimates. The weekly and monthly data are adjusted to the total production figure obtained from the annual canvass of producers. Tables 17 and 18 show the adjusted weekly and monthly production totals for the calendar year 1956. Production by months for 1952–56 is illustrated graphically in figure 3.

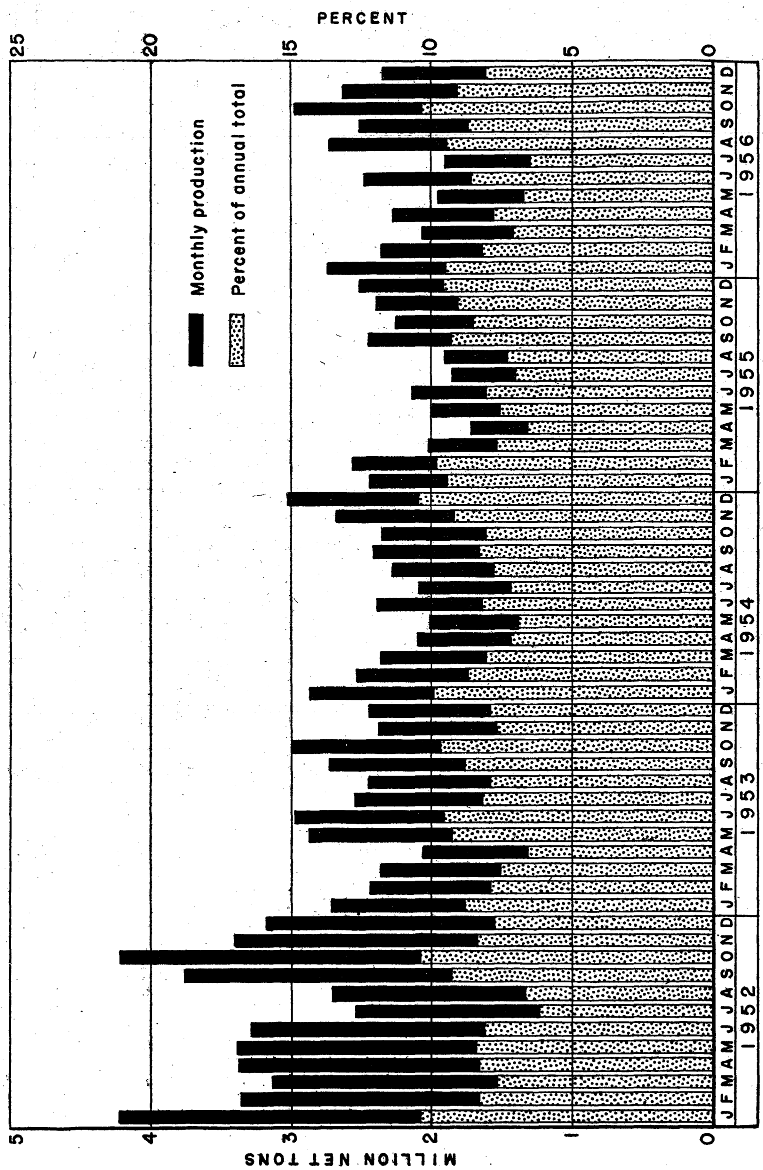

FIGURE 3.—Production of Pennsylvania anthracite by months, 1952–56.

TABLE 17.—Estimated weekly production of Pennsylvania anthracite in 1956 [1]

Week ended—	Thousand net tons	Week ended—	Thousand net tons	Week ended—	Thousand net tons	Week ended—	Thousand net tons
Jan. 7	504	Apr. 14	551	July 21	585	Oct. 27	649
14	675	21	559	28	587	Nov. 3	504
21	690	28	569	Aug. 4	586	10	679
28	637	May 5	525	11	590	17	647
Feb. 4	630	12	407	18	582	24	452
11	592	19	425	25	604	Dec. 1	666
18	512	26	409	Sept. 1	608	8	628
25	578	June 2	402	8	497	15	691
Mar. 3	479	9	535	15	662	22	569
10	413	16	544	22	665	29	355
17	435	23	602	29	663	31	[2] 61
24	501	30	680	Oct. 6	647		
31	509	July 7	53	13	694	Total	28,900
Apr. 7	467	14	446	20	700		

[1] Estimated from weekly carloadings as reported by the Association of American Railroads; adjusted to annual production total from Bureau of Mines canvass.

[2] Figures represent output of working days in that part of week included in calendar year 1956. Preliminary production for week of January 5, 1957, was 405,000 tons.

TABLE 18.—Estimated monthly production of Pennsylvania anthracite, 1949–56, in thousand net tons [1]

Month	1949	1950	1951	1952	1953	1954	1955	1956
January	3,725	2,893	4,316	4,221	2,707	2,874	2,454	2,743
February	2,930	2,563	3,621	3,362	2,438	2,525	2,568	2,360
March	2,375	4,847	2,244	3,140	2,354	2,364	2,007	2,052
April	3,725	3,331	2,675	3,384	2,048	2,100	1,723	2,258
May	4,407	4,228	3,723	3,400	2,869	2,013	1,985	1,947
June	3,406	4,166	3,848	3,293	2,975	2,387	2,130	2,470
July	3,925	2,855	2,847	2,522	2,551	2,080	1,845	1,890
August	3,710	4,386	3,612	2,704	2,452	2,270	1,904	2,729
September	2,114	3,835	3,267	3,761	2,732	2,416	2,453	2,509
October	4,979	4,282	4,675	4,213	2,994	2,353	2,244	2,971
November	4,657	3,355	4,129	3,405	2,386	2,681	2,385	2,629
December	2,749	3,336	3,713	3,178	2,443	3,020	2,507	2,342
Total	42,702	44,077	42,670	40,583	30,949	29,083	26,205	28,900

[1] Production is estimated from weekly carloadings as reported by the Association of American Railroads and includes mine fuel, coal sold locally, and dredge coal.

Mechanical Loading.—Of the 15 million tons produced underground in 1956, 49 percent was mechanically loaded, compared with 46 percent in 1955 and 41 percent in 1954. The steady increase in the proportion of mechanically loaded underground production has been due to the efforts of producers to lower costs by concentrating underground mining in those areas considered to be most amenable to mechanization and by making greater use of the mechanical loading equipment available.

The Northern field again ranked first in mechanical loading, with 86 percent of the year's total, followed by the Southern and Western Middle fields, with 6 percent each, and the Eastern Middle field, with 2 percent. Compared with 1955, these data indicated increases of 80, 52 and 5 percent in the Western Middle, Southern, and Northern fields, respectively, while the quantity mechanically loaded underground declined 4 percent in the Eastern Middle field. As its coal measures are relatively flatter, the Northern field traditionally has led the industry in the percentage of underground production loaded mechanically. In 1956, 76 percent of the coal produced underground in the Northern field was mechanically loaded, compared with 73 percent in 1955; 50 percent in the Eastern Middle, compared with 30 percent; 16 percent in the Western Middle, compared with 10 percent; and, 12 percent in the Southern, compared with 8 percent in 1955. Tables 19–21 show detailed information on mechanical loading, while figure 4 indicates the trend in the quantities of anthracite mechanically loaded, hand loaded, and stripped for the period, 1935–56.

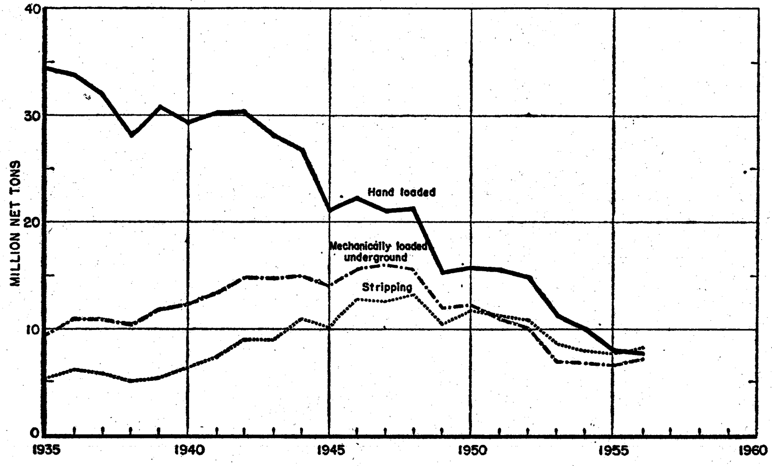

FIGURE 4.—Pennsylvania anthracite mechanically loaded, hand loaded, and stripped, 1935–56.

TABLE 19.—Pennsylvania anthracite loaded mechanically underground, 1955–56, by fields, in net tons

Field	Scraper loaders [1]		Pit-car loaders		Hand-loaded face conveyors, all types [2]		Total mechanically loaded	
	1955	1956	1955	1956	1955	1956	1955	1956
Northern	1,227,314	1,768,880	45,525	70,129	4,692,724	4,435,371	5,965,563	6,274,380
Eastern Middle	18,082	51,873			150,772	110,889	168,854	162,762
Western Middle	61,913	204,818			189,518	248,984	251,431	453,802
Southern	37,162	132,180	4,340		233,589	284,986	275,091	417,166
Total	1,344,471	2,157,751	49,865	70,129	5,266,603	5,080,230	6,660,939	7,308,110

[1] Includes mobile loaders.
[2] Shaker chutes, including those equipped with duckbills.

TABLE 20.—Pennsylvania anthracite loaded mechanically underground, 1952–56

Year	Scraper loaders		Mobile loaders		Conveyors [1] and pit-car loaders		Total loaded mechanically	
	Number of units	Net tons loaded	Number of units	Net tons loaded	Number of units	Net tons loaded	Number of units	Net tons loaded
1952	456	1,321,930	54	85,843	3,232	8,626,691	3,742	10,034,464
1953	489	1,206,241	39	22,252	2,784	5,610,276	3,312	6,838,769
1954	359	959,532	68	445,721	2,277	5,572,782	2,704	6,978,035
1955	279	761,945	79	582,526	1,940	5,316,468	2,298	6,660,939
1956	303	1,080,339	80	1,077,412	1,593	5,150,359	1,976	7,308,110

[1] Includes duckbills and other self-loading conveyors.

TABLE 21.—Trends in mechanical loading, hand loading, and stripping of Pennsylvania anthracite, 1927–56

[Mechanical loading includes coal handled on pit-car loaders and hand-loaded face conveyors]

Year	Fresh-mined coal							
	Underground					From strip pits		Total
	Mechanical loading (net tons)	Percent of total underground	Hand loading (net tons)	Percent of total underground	Total (net tons)	Net tons	Percent of fresh mined	
1927	[1] 2,223,281	3.0	71,434,537	97.0	73,657,818	2,153,156	2.8	75,810,974
1928	[1] 2,351,074	3.4	67,373,788	96.6	69,724,862	2,422,924	3.4	72,147,786
1929	3,470,158	5.0	66,493,690	95.0	69,963,848	1,911,766	2.7	71,875,614
1930	4,467,750	6.9	60,458,344	93.1	64,926,094	2,536,288	3.8	67,462,382
1931	4,384,780	8.2	49,074,722	91.8	53,459,502	3,813,237	6.7	57,272,739
1932	5,433,340	12.4	38,400,820	87.6	43,834,160	3,980,973	8.3	47,815,133
1933	6,557,267	16.0	34,474,844	84.0	41,032,111	4,932,069	10.7	45,964,180
1934	9,284,486	19.1	39,290,255	80.9	48,574,741	5,798,138	10.7	54,372,879
1935	9,279,057	21.2	34,503,819	78.8	43,782,876	5,187,072	10.6	48,969,948
1936	10,827,946	24.2	33,898,560	75.8	44,726,506	6,203,267	12.2	50,929,773
1937	10,683,837	25.1	31,882,514	74.9	42,566,351	5,696,018	11.8	48,262,369
1938	10,151,669	26.6	27,990,628	73.4	38,142,297	5,095,341	11.8	43,237,638
1939	11,773,833	27.7	30,797,715	72.3	42,571,548	5,486,479	11.4	48,058,027
1940	12,326,000	29.7	29,190,837	70.3	41,516,837	6,352,700	13.3	47,869,537
1941	13,441,987	30.6	30,435,277	69.4	43,877,264	7,316,574	14.3	51,193,838
1942	14,741,459	32.6	30,495,240	67.4	45,236,699	9,070,933	16.7	54,307,632
1943	14,745,793	34.5	27,990,005	65.5	42,735,798	8,989,387	17.4	51,725,185
1944	14,975,146	35.8	26,800,270	64.2	41,775,416	10,953,030	20.8	52,728,446
1945	13,927,955	39.9	20,957,744	60.1	34,885,699	10,056,325	22.4	44,942,024
1946	15,619,162	41.0	22,465,295	59.0	38,084,457	12,858,930	25.2	50,943,387
1947	16,054,011	43.4	20,909,101	56.6	36,963,112	12,603,545	25.4	49,566,657
1948	15,742,368	42.3	21,432,923	57.7	37,175,291	13,352,874	26.4	50,528,165
1949	11,858,088	43.9	15,172,562	56.1	27,030,650	10,376,808	27.7	37,407,458
1950	12,335,650	43.8	15,820,245	56.2	28,155,895	11,833,934	29.6	39,989,829
1951	10,847,787	41.2	15,494,452	58.8	26,342,239	11,135,990	29.7	37,478,229
1952	10,034,464	40.5	14,713,819	59.5	24,748.283	10,696,705	30.2	35,444,988
1953	6,838,769	38.2	11,054,720	61.8	17,893,489	8,606,482	32.5	26,499,971
1954	6,978,035	41.4	9,874,373	58.6	16,852,408	7,939,680	32.0	24,792,088
1955	6,660,939	45.9	7,837,819	54.1	14,498,758	7,703,907	34.7	22,202,665
1956	7,308,110	48.5	7,746,794	51.5	15,054,904	8,354,230	35.7	23,409,134

[1] As reported by Commonwealth of Pennsylvania, Department of Mines.

Cutting Machines.—Due to the physical and mechanical difficulties of mining the thick, steeply-pitching seams of Pennsylvania anthracite, relatively little of the annual underground production is cut by machine. Although the tonnage cut mechanically has varied between 300,000 and 400,000 tons annually since 1952, the number of machines reported in use has declined abruptly. For example, 146 cutters were reported used in 1952, but only 29 in 1956. All the machines reported were employed in the Wyoming region, and each was a "permissible" type—that is, conforming to safety standards established by the Bureau of Mines.

Power Equipment.—A total of 446 power shovels and draglines was reported used in 1956 for stripping anthracite and reclaiming coal from culm and silt banks—an increase of 6 machines over 1955. Of the 1956 total, 204 were power shovels and 242, draglines—an increase of 13 shovels and a decrease of 7 draglines. (See table 22.)

TABLE 22.—Power shovels and draglines used in stripping Pennsylvania anthracite, 1954–56, by type of power

Type of power	1954			1955			1956		
	Number of power shovels	Number of draglines	Total	Number of power shovels	Number of draglines	Total	Number of power shovels	Number of draglines	Total
Gasoline	43	13	56	19	6	25	24	17	41
Electric	93	79	172	45	48	93	52	42	94
Diesel	185	205	390	127	195	322	127	183	310
Steam		3	3				1		1
Total	321	300	621	191	249	440	204	242	446

PRICES AND VALUE OF SALES

Because of increased domestic and foreign demand, anthracite commanded generally higher prices in 1956. Aided by the steady monthly movement abroad, the producers disposed of current production fairly readily and also moved a considerable tonnage from ground storage at the mines. As a result, there were few sales at "distress" prices, and most of the tonnage sold at or near the published circular prices.

According to Saward's Journal, prices f. o. b. mine in effect at the end of 1956 ranged between the following limits: Broken, \$15.70–\$15.95; Egg, \$15.70–\$16.20; Stove, \$15.75–\$16.20; Chestnut, \$15.75–\$16.20; Pea, \$11.95–\$12.30; Buckwheat No. 1, \$10.50–\$11.10; Buckwheat No. 2 (Rice), \$9.50–\$10.10; and Buckwheat No. 3 (Barley), \$6.75–\$7.25. The prices quoted were for "standard" anthracite, specifications for which are shown in table 23. Although prices f. o. b. mine vary with individual companies, a comparison of the price range above with those in effect at the close of 1955 indicates that the prices quoted in December 1956 were approximately \$1.30 per ton higher for Pea coal to as much as \$2.50 per ton higher for Egg. For the smaller sizes, 1956 circular prices varied from about \$2.55 per ton more for Buckwheat No. 2 to about \$0.75 for Buckwheat No. 3 (Barley).

TABLE 23.—Standard anthracite specifications approved and adopted by the Anthracite Committee, effective July 28, 1947

Size	Round test mesh (inches)	Percent: Oversize, maximum	Undersize: Maximum	Undersize: Minimum	Maximum impurities[1]: Slate	Bone or ash[2]: Bone	Bone or ash[2]: Ash
Broken	Through 4 3/8				1½	2	11
	Over 3¼ to 3		15	7½			
Egg	Through 3¼ to 3	5			1½	2	11
	Over 2 7/16		15	7½			
Stove	Through 2 7/16	7½			2	3	11
	Over 1 5/8		15	7½			
Chestnut	Through 1 5/8	7½			3	4	11
	Over 13/16		15	7½			
Pea	Through 13/16	10			4	5	12
	Over 9/16		15	7½			
Buckwheat No. 1	Through 9/16	10					13
	Over 5/16		15	7½			
Buckwheat No. 2 (Rice)	Through 5/16	10					13
	Over 3/16		17	7½			
Buckwheat No. 3 (Barley)	Through 3/16	10					15
	Over 3/32		20	10			
Buckwheat No. 4	Through 3/32	20					15
	Over 3/64		30	10			
Buckwheat No. 5	Through 3/64	30	No limit				16

[1] When slate content in the sizes from Broken to Chestnut, inclusive, is less than above standards, bone content may be increased by 1½ times the decrease in the slate content under the allowable limits, but slate content specified above shall not be exceeded in any event.

A tolerance of 1 percent is allowed on the maximum percentage of undersize and the maximum percentage of ash content.

The maximum percentage of undersize is applicable only to anthracite as it is produced at the preparation plant. Slate is defined as any material that has less than 40 percent fixed carbon.

Bone is defined as any material that has 40 percent or more, but less than 75 percent, fixed carbon.

[2] Ash determinations are on a dry basis.

As a result of the relatively firmer price structure in 1956, the average value received f. o. b. mine increased from $7.86 per ton in 1955 to $8.19 in 1956. In recent years the demand for and revenue received from the sale of the larger space-heating sizes have declined more sharply than the smaller sizes owing to the competition of natural gas and heating oils. However, in 1956, the cold weather prevailing in the major anthracite markets and increased demand in Europe apparently did much to reverse this trend. For example, shipments of Buckwheat No. 1 and larger sizes from preparation plants increased 7.7 percent over 1955, yet the total dollar value received for these shipments increased 14.1 percent. On the other hand, whereas shipments of Buckwheat No. 2 (Rice) and smaller sizes increased 15.7 percent, the total sales revenue increased only 19 percent.

Detailed information on average prices received per ton, by type of preparation plant, regions, and for coal sold in the producing region will be found in tables 24 through 27. However, as breakers and washeries have been combined for the first time in 1956, the historical data in these tables have been recalculated to reflect this combination and provide comparable statistics for the years shown. Retail-price data on selected fuels, compiled monthly from reports of the Bureau of Labor Statistics, United States Department of Labor, are listed for certain cities in table 28.

TABLE 24.—Average sales realization per net ton of Pennsylvania anthracite, exclusive of dredge coal, shipped to points outside producing region, 1952–56, by regions and sizes

[Value does not include margins of separately incorporated sales companies]

Size	Lehigh region					Schuylkill region				
	1952	1953	1954	1955	1956	1952	1953	1954	1955	1956
Lump [1] and Broken	$13.43	$14.52	$13.05	$11.80	$12.78	$13.44	$14.12	$12.24	$11.03	$12.19
Egg	13.53	14.11	12.80	11.14	11.61	13.30	13.53	12.09	11.05	11.93
Stove	13.77	14.31	13.03	11.70	11.94	13.39	13.48	12.08	11.14	11.95
Chestnut	13.77	14.28	12.74	11.81	12.02	13.25	13.37	11.70	11.02	11.87
Pea	10.32	10.79	9.74	8.13	8.50	9.88	10.12	8.87	7.90	8.77
Total Pea and larger	13.28	13.74	12.37	10.97	11.25	12.74	12.78	11.27	10.43	11.24
Buckwheat No. 1	8.00	9.46	8.45	6.61	7.25	7.85	9.14	7.84	6.34	6.95
Buckwheat No. 2 (Rice)	6.44	7.78	7.50	6.66	6.85	6.20	7.31	6.83	6.26	6.50
Buckwheat No. 3 (Barley)	4.96	5.58	5.79	5.29	5.38	4.81	5.23	5.28	5.11	5.35
Buckwheat No. 4	3.80	4.23	4.05	3.91	4.19	3.43	3.81	3.84	3.85	4.05
Buckwheat No. 5	3.53	3.65	3.54	3.18	3.80	3.27	3.90	3.47	3.04	3.65
Other	3.23	3.69	3.43	3.22	3.39	3.04	3.66	3.24	3.21	3.42
Total Buckwheat No. 1 and smaller	5.25	6.09	5.62	4.83	4.79	5.27	6.01	5.45	4.82	5.12
Total all sizes	9.04	9.70	8.69	7.59	7.21	8.52	8.78	7.93	7.20	7.60

Size	Wyoming region					Sullivan County				
Lump [1] and Broken	$13.33	$14.08	$12.06	$11.15	$13.15	------	------	------	------	------
Egg	13.19	13.62	11.88	10.91	11.70	------	------	------	------	------
Stove	13.63	14.07	12.30	11.46	12.06	$13.55	$14.27	$13.00	------	------
Chestnut	13.60	13.91	12.04	11.45	12.23	13.47	14.18	13.00	$10.00	$10.30
Pea	10.42	10.69	9.37	8.38	9.38	10.55	11.24	11.00	------	9.22
Total Pea and larger	13.26	13.59	11.79	11.08	11.77	12.35	12.94	12.14	10.00	9.98
Buckwheat No. 1	8.01	9.52	8.40	6.59	7.37	7.77	9.03	8.00	6.00	------
Buckwheat No. 2 (Rice)	6.43	7.76	7.32	6.61	7.00	------	------	------	------	6.49
Buckwheat No. 3 (Barley)	5.05	5.67	5.72	5.46	5.53	------	------	3.05	------	5.07
Buckwheat No. 4	4.18	4.75	4.11	3.88	4.04	------	------	------	------	------
Buckwheat No. 5	3.28	4.36	3.33	3.24	3.63	------	------	------	------	------
Other	3.34	3.52	3.43	3.03	3.42	3.81	4.27	------	------	------
Total Buckwheat No. 1 and smaller	6.54	7.42	6.59	5.62	6.14	4.60	5.38	4.37	6.00	6.00
Total all sizes	11.08	11.43	9.75	9.09	9.77	7.86	9.19	7.71	9.00	6.89

Size	Total									
	Excluding Sullivan County					Including Sullivan County				
Lump [1] and Broken	$13.39	$14.21	$12.39	$11.24	$12.81	$13.39	$14.21	$12.39	$11.24	$12.81
Egg	13.29	13.65	12.02	10.99	11.78	13.29	13.65	12.02	10.99	11.78
Stove	13.57	13.90	12.32	11.39	12.01	13.57	13.90	12.32	11.39	12.01
Chestnut	13.49	13.77	12.01	11.36	12.07	13.49	13.77	12.01	11.36	12.07
Pea	10.15	10.43	9.18	8.12	8.95	10.15	10.43	9.18	8.12	8.95
Total Pea and larger	13.07	13.31	11.67	10.83	11.50	13.07	13.31	11.67	10.83	11.50
Buckwheat No. 1	7.94	9.32	8.14	6.49	7.16	7.93	9.32	8.14	6.49	7.16
Buckwheat No. 2 (Rice)	6.32	7.53	7.12	6.46	6.74	6.32	7.53	7.12	6.46	6.74
Buckwheat No. 3 (Barley)	4.89	5.39	5.48	5.26	5.41	4.89	5.39	5.48	5.26	5.41
Buckwheat No. 4	3.58	4.01	3.95	3.87	4.09	3.58	4.01	3.95	3.87	4.09
Buckwheat No. 5	3.35	3.84	3.44	3.11	3.69	3.35	3.84	3.44	3.11	3.69
Other	3.18	3.65	3.32	3.18	3.41	3.18	3.65	3.32	3.18	3.41
Total Buckwheat No. 1 and smaller	5.60	6.37	5.83	5.05	5.31	5.60	6.37	5.83	5.05	5.31
Total all sizes	9.58	9.87	8.76	8.00	8.33	9.58	9.87	8.76	8.00	8.33

[1] Quantity of Lump included is insignificant.

TABLE 25.—Average sales realization per net ton of Pennsylvania anthracite, exclusive of dredge coal, shipped to points inside producing region, 1952–56, by regions and sizes

[Value does not include margins of separately incorporated sales companies]

Size	Lehigh region					Schuylkill region				
	1952	1953	1954	1955	1956	1952	1953	1954	1955	1956
Lump [1] and Broken	$14.20	$13.33	$14.00	------	------	$13.70	$14.55	$12.51	$10.97	$11.97
Egg	14.67	15.71	15.37	$14.42	$13.34	13.75	14.09	12.43	11.04	12.29
Stove	14.56	14.95	13.61	13.27	13.87	12.70	12.23	11.22	10.94	11.86
Chestnut	14.35	15.38	14.48	14.31	13.65	13.10	12.77	11.34	10.85	11.94
Pea	11.26	11.99	11.43	11.39	11.20	10.27	10.35	9.06	8.60	9.20
Total Pea and larger	12.64	13.21	12.49	12.42	12.13	11.78	11.69	10.31	10.10	10.92
Buckwheat No. 1	8.58	10.23	10.26	10.10	9.81	7.86	8.64	7.47	6.42	6.93
Buckwheat No. 2 (Rice)	7.14	8.59	8.77	8.84	8.58	6.15	6.58	6.55	6.16	6.54
Buckwheat No. 3 (Barley)	5.64	6.35	6.63	6.78	6.87	4.35	4.86	4.99	4.76	5.04
Buckwheat No. 4	5.16	5.26	5.35	4.16	5.26	3.62	3.58	3.37	3.60	3.33
Buckwheat No. 5	------	------	------	------	------	3.31	3.40	2.72	2.61	2.68
Other	------	------	------	3.25	4.00	1.97	3.46	3.00	2.05	2.82
Total Buckwheat No. 1 and smaller	7.58	8.89	8.98	7.51	8.37	5.28	5.82	5.51	5.43	5.83
Total all sizes	10.57	11.28	10.90	9.78	10.23	8.46	8.73	7.85	7.98	8.52

Size	Wyoming region					Sullivan County				
Lump [1] and Broken	$12.99	$13.73	$12.23	$10.86	$11.30	------	------	------	------	------
Egg	13.41	13.60	12.25	11.23	12.54	------	------	------	------	------
Stove	14.23	14.77	13.55	12.56	13.38	$13.60	$14.29	$13.00	------	------
Chestnut	14.22	14.89	13.45	12.77	13.39	13.46	14.18	13.00	$10.00	$12.40
Pea	11.08	11.89	10.85	10.09	10.57	10.54	11.24	11.00	9.00	11.12
Total Pea and larger	12.22	12.91	11.64	10.94	11.45	12.08	12.94	12.07	9.46	11.91
Buckwheat No. 1	8.33	9.98	9.48	8.38	8.62	7.78	6.84	8.00	6.00	------
Buckwheat No. 2 (Rice)	6.62	8.14	7.75	7.17	7.45	------	------	------	4.50	7.21
Buckwheat No. 3 (Barley)	5.31	5.90	5.72	5.50	5.51	------	------	3.28	------	5.07
Buckwheat No. 4	4.19	3.84	4.13	3.92	------	------	------	------	------	------
Buckwheat No. 5	------	3.79	3.33	------	3.46	------	------	------	------	------
Other	2.97	2.64	2.58	3.04	2.80	4.28	4.27	------	------	------
Total Buckwheat No. 1 and smaller	6.23	7.37	6.78	6.58	6.39	6.01	5.00	4.85	4.94	5.99
Total all sizes	9.22	10.08	9.11	8.78	8.77	10.46	8.86	8.59	6.35	10.17

Size	Total									
	Excluding Sullivan County					Including Sullivan County				
Lump [1] and Broken	$13.04	$13.77	$12.23	$10.86	$11.32	$13.04	$13.77	$12.23	$10.86	$11.32
Egg	13.62	13.85	12.58	11.25	12.49	13.62	13.85	12.58	11.25	12.49
Stove	13.46	13.24	11.89	11.33	12.16	13.46	13.24	11.89	11.33	12.16
Chestnut	13.87	14.18	12.66	11.97	12.61	13.87	14.18	12.66	11.97	12.61
Pea	10.92	11.60	10.46	9.86	10.20	10.92	11.59	10.46	9.86	10.20
Total Pea and larger	12.15	12.59	11.27	10.75	11.26	12.15	12.59	11.27	10.75	11.26
Buckwheat No. 1	8.24	9.68	8.92	7.89	8.04	8.24	9.68	8.92	7.88	8.04
Buckwheat No. 2 (Rice)	6.60	7.84	7.53	7.12	7.21	6.60	7.84	7.53	7.10	7.21
Buckwheat No. 3 (Barley)	5.10	5.64	5.53	5.25	5.36	5.10	5.64	5.51	5.25	5.36
Buckwheat No. 4	3.63	3.68	3.62	3.72	3.41	3.63	3.68	3.62	3.72	3.41
Buckwheat No. 5	3.31	3.72	3.32	2.61	3.37	3.31	3.72	3.32	2.61	3.37
Other	2.90	2.98	2.76	3.05	2.86	2.90	3.01	2.76	3.05	2.86
Total Buckwheat No. 1 and smaller	6.05	7.05	6.51	6.29	6.32	6.05	7.05	6.51	6.28	6.32
Total all sizes	9.13	9.81	8.83	8.59	8.77	9.13	9.81	8.83	8.58	8.77

[1] Quantity of Lump included is insignificant.

TABLE 26.—Average sales realization per net ton of Pennsylvania anthracite, exclusive of dredge coal, shipped to points outside and inside producing region in 1956, by regions and sizes

[Value does not include margins of separately incorporated sales companies]

Size	Lehigh region			Schuylkill region			Wyoming region		
	Shipped outside region	Local sales	Total	Shipped outside region	Local sales	Total	Shipped outside region	Local sales	Total
Lump [1] and Broken	$12.78		$12.78	$12.19	$11.97	$12.16	$13.15	$11.30	$11.86
Egg	11.61	$13.34	11.63	11.93	12.29	11.94	11.70	12.54	11.73
Stove	11.94	13.87	11.96	11.95	11.86	11.94	12.06	13.38	12.08
Chestnut	12.02	13.65	12.14	11.87	11.94	11.88	12.23	13.39	12.34
Pea	8.50	11.20	9.09	8.77	9.20	8.89	9.38	10.57	9.95
Total Pea and larger	11.25	12.13	11.32	11.24	10.92	11.18	11.77	11.45	11.72
Buckwheat No. 1	7.25	9.81	7.50	6.95	6.93	6.94	7.37	8.62	7.71
Buckwheat No. 2 (Rice)	6.85	8.58	7.24	6.50	6.54	6.51	7.00	7.45	7.12
Buckwheat No. 3 (Barley)	5.38	6.87	5.45	5.35	5.04	5.31	5.53	5.51	5.53
Buckwheat No. 4	4.19	5.26	4.19	4.05	3.33	4.02	4.04		4.04
Buckwheat No. 5	3.80		3.80	3.65	2.68	3.63	3.63	3.46	3.52
Other	3.39	4.00	3.40	3.42	2.82	3.38	3.42	2.80	3.18
Total Buckwheat No. 1 and smaller	4.79	8.37	4.98	5.12	5.83	5.21	6.14	6.39	6.21
Total all sizes	7.21	10.23	7.41	7.60	8.52	7.73	9.77	8.77	9.57

Size	Sullivan County			Total: Excluding Sullivan County			Total: Including Sullivan County		
Lump [1] and Broken				$12.81	$11.32	$11.92	$12.81	$11.32	$11.92
Egg				11.78	12.49	11.80	11.78	12.49	11.80
Stove				12.01	12.16	12.01	12.01	12.16	12.01
Chestnut	$10.30	$12.40	$11.83	12.07	12.61	12.14	12.07	12.61	12.14
Pea	9.22	11.12	10.75	8.95	10.20	9.40	8.95	10.20	9.40
Total Pea and larger	9.98	11.91	11.43	11.50	11.26	11.46	11.50	11.26	11.46
Buckwheat No. 1				7.16	8.04	7.34	7.16	8.04	7.34
Buckwheat No. 2 (Rice)	6.49	7.21	6.63	6.74	7.21	6.85	6.74	7.21	6.85
Buckwheat No. 3 (Barley)	5.07	5.07	5.07	5.41	5.36	5.40	5.41	5.36	5.40
Buckwheat No. 4				4.09	3.41	4.07	4.09	3.41	4.07
Buckwheat No. 5				3.69	3.37	3.66	3.69	3.37	3.66
Other				3.41	2.86	3.35	3.41	2.86	3.35
Total Buckwheat No. 1 and smaller	6.00	5.99	6.00	5.31	6.32	5.46	5.31	6.32	5.46
Total all sizes	6.89	10.17	8.51	8.33	8.77	8.39	8.33	8.77	8.39

[1] Quantity of Lump included is insignificant.

TABLE 27.—Average value per net ton of Pennsylvania anthracite from all sources, 1955–56, by regions [1]

[Data include washery and dredge coal]

Region	1955				1956			
	Shipped outside region	Local sales	Colliery fuel	Total production	Shipped outside region	Local sales	Colliery fuel	Total production
Lehigh	$7.56	$9.78	$6.26	$7.73	$7.17	$10.23	$6.25	$7.36
Schuylkill	6.85	7.85	5.56	6.97	7.27	8.44	5.93	7.43
Wyoming	9.07	8.78	4.43	8.87	9.74	8.77	4.85	9.44
Total, excluding Sullivan County	7.81	8.56	4.80	7.87	8.14	8.74	5.23	8.19
Sullivan County	9.00	6.35		6.40	6.89	10.17	11.00	8.51
Grand total	7.81	8.54	4.80	7.86	8.14	8.74	5.23	8.19

[1] Value given for shipments is value at which coal left possession of producing company and does not nclude margins of separately incorporated sales companies.

TABLE 28.—Retail prices of selected fuels in 1956, by months, for various cities [1]

(Coal and coke, per net ton; heating oil, per 100 gallons)

City and fuel	January	February	March	April	May	June	July	August	September	October	November	December
Baltimore, Md.:												
Anthracite:												
Stove	$21.16	$21.50	$21.56	$21.56	$21.56	$21.05	$21.05	$21.05	$21.39	$22.78	$23.12	$24.48
Buckwheat No. 1	17.60	17.60	17.67	17.67	17.67	17.67	17.67	17.67	17.67	18.23	18.23	19.25
Heating oil: Fuel oil No. 2	14.43	14.43	14.43	14.43	14.43	14.43	14.43	14.43	14.43	14.99	14.99	14.99
Boston, Mass.:												
Anthracite:												
Stove	27.95	27.95	27.95	27.95	27.45	27.45	27.20	27.95	27.95	28.95	28.95	29.95
Buckwheat No. 1	21.30	21.30	21.30	21.05	20.80	20.80	20.55	21.30	21.30	21.80	21.92	22.58
Heating oil: Fuel oil No. 2	14.60	14.60	14.60	14.60	14.60	14.60	14.60	14.60	14.60	15.08	15.12	15.12
New York, N. Y.:												
Anthracite:												
Stove	25.93	26.99	26.99	26.99	24.48	25.16	25.42	25.76	25.76	26.62	27.91	29.10
Pea	18.66	19.32	19.32	19.32	19.59	20.34	20.40	20.64	20.64	21.28	22.05	23.26
Buckwheat No. 1	16.85	17.43	17.43	17.43	17.62	18.36	18.40	18.44	18.44	19.08	20.13	21.42
Heating oil: Fuel oil No. 2	14.87	15.06	15.06	15.06	15.06	15.06	15.06	15.06	15.06	15.45	15.45	15.45
Philadelphia, Pa.:												
Anthracite:												
Chestnut	22.95	23.28	23.28	23.28	21.28	21.12	21.45	21.95	22.28	22.95	23.95	24.95
Buckwheat No. 1	17.75	17.75	17.75	17.75	16.78	16.62	16.78	16.95	17.12	17.62	18.95	19.95
Heating oil: Fuel oil No. 2	14.00	14.00	14.42	14.42	14.42	14.44	14.44	14.44	14.44	14.85	14.83	14.83
Washington, D. C.:												
Anthracite:												
Chestnut	25.70	25.70	25.86	25.86	23.82	24.33	24.84	25.35	25.86	25.86	26.62	27.85
Buckwheat No. 1	19.05	19.05	19.20	19.20	18.28	18.54	18.79	19.05	19.30	19.30	19.58	20.81
Heating oil: Fuel oil No. 2	14.98	14.98	14.98	14.98	14.98	14.98	14.98	14.98	14.98	15.43	15.40	15.40

[1] Compiled from reports of Bureau of Labor Statistics. Prices are as of the 15th of each month. Data are preliminary. Sales tax included where applicable.

EMPLOYMENT

Employment data for the anthracite industry in 1956 were compiled from the Bureau of Mines questionnaire, Mine Injuries and Employment, Pennsylvania Anthracite, whereas for 1954 and earlier years the data were collected on the same questionnaires as the production statistics. Employment data for 1955 were estimated. Overall coverage remained the same under the new collection procedure and included all production, development, maintenance, and repair workers, supervisory and technical personnel, and proprietors and firm members performing work at the operation. Office employees and employees engaged in affiliated industries other than coal production were excluded. The schedule requests data only on men at work and on man-shifts worked so that absenteeism and labor turnover are eliminated. Hence, the average number of men at work on active mine days is lower than a count of employees on the payroll, or the number available for work as shown by other employee surveys. Because of certain limitations imposed by the current questionnaire, it is impossible to provide the same breakdown of employment data for 1956 as in earlier years. For example, only total underground workers are shown; formerly, this group was shown as "Miners and their laborers" and "Other". All preparation plant employees are included under "Other surface" workers.

A daily average of 31,516 men worked in the anthracite industry in 1956—a decrease of 6 percent. As the industry operated 216 days (10 percent more than the 197 days active in 1955) but produced approximately 10 percent more tonnage with a smaller work force, the productivity rate increased sharply—establishing a new record of 4.25 tons per man-day, as compared with the previous high of 4.02 tons set in 1954.

Of the 1956 labor force, 55 percent worked underground, 15 percent at strip pits, and 30 percent at culm banks, preparation plants, and other surface installations. Between 1955 and 1956 the number of men reported working underground declined 14 percent while the number employed at strip pits rose 4 percent and at other surface operations, 6 percent. The total labor force was divided regionally as follows: Wyoming, 48 percent; Schuylkill, 36 percent; and Lehigh, 16 percent, compared with 43, 41, and 16 percent, respectively, in 1955. Employment data appear in tables 29 and 30.

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TABLE 29.—Men employed and days worked at operations producing Pennsylvania anthracite in 1956, by regions

[Includes operations of strip contractors]

Region	Average number of men working daily				Average number of days plant operated	Man-days of labor	Average tons per man per day
	Underground	In strip pits	Other surface	Total			
Lehigh:							
Breaker and washery	2,282	1,199	1,542	5,023	199	997,705	4.82
Dredge			12	12	234	2,802	15.80
Total Lehigh	2,282	1,199	1,554	5,035	199	1,000,507	4.86
Schuylkill:							
Breaker and washery	4,671	2,436	4,009	11,116	216	2,405,659	5.10
Dredge			143	143	184	26,256	23.90
Total Schuylkill	4,671	2,436	4,152	11,259	216	2,431,915	5.30
Wyoming:							
Breaker and washery	10,218	1,202	3,785	15,205	222	3,368,489	3.29
Dredge			10	10	168	1,680	26.56
Total Wyoming	10,218	1,202	3,795	15,215	222	3,370,169	3.30
Total, excluding Sullivan County:							
Breaker and washery	17,171	4,837	9,336	31,344	216	6,771,853	4.16
Dredge			165	165	186	30,738	23.30
Total	17,171	4,837	9,501	31,509	216	6,802,591	4.25
Sullivan County: Breaker		3	4	7	199	1,392	4.81
Grand total	17,171	4,840	9,505	31,516	216	6,803,983	4.25

TABLE 30.—Men employed at operations producing Pennsylvania anthracite, 1955–56, by counties

[Includes operations of strip contractors]

County	1955 [1]	1956	County	1955 [1]	1956
Berks, Lancaster, Lebanon, Northampton, and Snyder [2]	130	106	Luzerne	13,442	13,003
Carbon	2,375	1,447	Northumberland	3,017	2,626
Columbia	1,515	974	Schuylkill	9,004	9,134
Dauphin	180	166	Sullivan	19	7
Lackawanna	3,841	4,053	Total	33,523	31,516

[1] Estimated.
[2] Counties producing dredge coal only. None employed in Berks County in 1956.

DISTRIBUTION

As Bureau of Mines canvasses on the distribution of Pennsylvania anthracite measure the flow of coal to specific markets for each coal year (ending March 31), respondents are requested to report all shipments made to final destinations, whether from current production or from stocks held in ground storage at the mines. However, as indicated in the Scope of Report section of this chapter, only tonnages put into and not taken from storage are included in the Bureau's weekly, monthly, and annual production data. Moreover, since the production and distribution data cover calendar and coal years, respectively, and are collected on separate canvasses with differences in coverage, a direct correlation between these groups of data is not possible.

A large percentage of the anthracite produced annually is shipped to final destination by wholesalers, sales agents, and dock operators. In many of these transactions the producer does not know the final destination of the coal; therefore, each concern engaged in producing or marketing anthracite is requested to report on all tonnages produced and sold to consumers. Generally, producing companies report on tonnages sold within the "local sales" area, to over-the-road truckers, and totals only for each wholesaler, sales agent, or dock operator with whom business was transacted during the reporting period. The wholesale distributors supply data on their shipments, by sizes, to each city, State, Province, or country. As it permits cross-checking all reports submitted, this method provides effective means of tracing coal shipments to final destinations, whether the coal moved all rail, rail-lake, rail-tidewater, or ex-dock rail or was reconsigned in transit. The distribution data published by the Bureau of Mines cover rail shipments by sizes to approximately 353 American and Canadian cities and 20 States and Provinces. Truck shipments are shown by State of destination only. Free copies of these Mineral Market Reports may be obtained by writing to the Bureau of Mines, Washington 25, D. C.

Shipments of Pennsylvania anthracite reported to the Bureau of Mines totaled 26,486,000 net tons for the 1955–56 coal year (see table 31), a decrease of less than 1 percent from the total reported for the 1954–55 coal year. Of this total, 88 percent was destined to points in the United States, 9 percent to Canada, and 3 percent to overseas destinations. These data indicated that shipments declined 2 and 5 percent to United States and Canadian destinations, respectively. However, the volume shipped overseas more than doubled that in the 1954–55 coal year, according to export data of the United States Department of Commerce.

In the United States shipments reported to the New England States were approximately 3 percent less than for the 1954–55 coal year, and shipments to the Middle Atlantic States (New Jersey, New York, and Pennsylvania) also declined 3 percent. The tonnage reported shipped to the South Atlantic States (Delaware, District of Columbia, Maryland, and Virginia only) exceeded 1954–55 coal-year shipments by 2 percent; the Lake States, 27 percent; and "all other States," 5 percent. In Canada, the Provinces of Ontario and Quebec imported 4 and 13 percent less Pennsylvania anthracite during the 1955–56 coal year; however, the Maritime Provinces increased imports by 117 percent.

TABLE 31.—Distribution of Pennsylvania anthracite, April 1, 1955, to March 31, 1956, by State, Province, and Country of destination in net tons

Destinations	Pea and larger						Buckwheat No. 1 and smaller					Total all sizes	Percent of total
	Broken	Egg	Stove	Chestnut	Pea	Total	Buckwheat No. 1	Buckwheat No. 2 (Rice)	Buckwheat No. 3 (Barley)	All other sizes	Total		
United States:													
New England States:													
Connecticut		3,046	115,031	128,714	10,327	257,118	25,884	19,109	27,930	418	73,341	330,459	1.25
Maine		4,845	62,883	54,914	1,828	124,470	13,444	11,251	109	1,254	26,058	150,528	.57
Massachusetts	871	51,867	457,744	222,570	18,108	751,160	78,941	59,300	19,778	24,534	182,553	933,713	3.52
New Hampshire		3,104	45,557	28,209	1,923	78,793	10,452	11,999	39,254	1,645	63,350	142,143	.54
Rhode Island		3,144	49,980	34,138	2,395	89,657	9,414	7,021		277	16,712	106,369	.40
Vermont	314	2,282	55,539	37,273	6,708	102,116	24,112	23,779	56	313	48,260	150,376	.57
Total	1,185	68,288	786,734	505,818	41,289	1,403,314	162,247	132,459	87,127	28,441	410,274	1,813,588	6.85
Middle Atlantic States:													
New Jersey	4,426	14,200	353,108	836,883	252,740	1,461,357	328,679	309,860	684,999	561,098	1,884,636	3,345,993	12.63
New York	1,743	104,893	1,275,252	1,133,936	911,518	3,427,342	1,500,687	541,696	550,918	705,861	3,299,162	6,726,504	25.40
Pennsylvania [1]	56,622	35,741	676,928	1,636,278	1,507,569	3,913,138	1,134,559	1,072,066	1,439,462	2,153,692	5,799,779	9,712,917	36.67
Total	62,791	154,834	2,305,288	3,607,097	2,671,827	8,801,837	2,963,925	1,923,622	2,675,379	3,420,651	10,983,577	19,785,414	74.70
South Atlantic States: [2]													
Delaware	3,867	2,091	27,651	84,065	4,180	121,854	4,305	4,110	13,764	5,194	27,373	149,227	.56
District of Columbia		2,823	27,681	32,761	3,471	66,736	17,645	1,607	319	1,413	20,984	87,720	.33
Maryland	547	4,110	100,159	114,375	24,428	243,619	38,641	6,320	199	78,565	123,725	367,344	1.39
Virginia		811	15,243	22,942	4,281	43,277	16,718	666		738	18,122	61,399	.23
Total	4,414	9,835	170,734	254,143	36,360	475,486	77,309	12,703	14,282	85,910	190,204	665,690	2.51
Lake States: [3]													
Illinois	60	2,596	9,385	19,983	15,822	47,846	32,854	4,645	6,390	19,054	62,943	110,789	.42
Michigan		2,591	34,667	18,206	1,245	56,709	3,934	11,870	183	70,233	86,220	142,929	.54
Minnesota			1,779	3,234	240	5,253		34		123,735	123,769	129,022	.49
Ohio		1,707	1,321	8,504	4,372	15,904	27,784	10,260	1,852	82,730	122,626	138,530	.52
Wisconsin		45	59,487	86,421	6,932	152,885	7,503	3,774		132,218	143,495	296,380	1.12
Total	60	6,939	106,639	136,348	28,611	278,597	72,075	30,583	8,425	427,970	539,053	817,650	3.09
All other States	4,616	485	4,494	24,195	1,028	34,818	34,493	4,998	6,771	200,231	246,493	281,311	1.06
Total United States	73,066	240,381	3,373,889	4,527,601	2,779,115	10,994,052	3,310,049	2,104,365	2,791,984	4,163,203	12,369,601	23,363,653	88.21

Canada:													
Ontario	--------	20, 746	886, 032	584, 476	66, 661	1, 557, 915	66, 988	75, 986	17, 949	16, 829	177, 752	1, 735, 667	6. 55
Quebec	--------	7, 120	160, 714	94, 206	14, 210	276, 250	84, 698	67, 148	65, 871	21, 345	239, 062	515, 312	1. 95
Other Provinces	331	2, 633	19, 065	16, 622	420	39, 071	2, 719	10, 621	49	1, 585	14, 974	54, 045	. 20
Total Canada	331	30, 499	1, 065, 811	695, 304	81, 291	1, 873, 236	154, 405	153, 755	83, 869	39, 759	431, 788	2, 305, 024	8. 70
Other countries [4]	--------	2, 889	16, 349	61, 157	52, 174	132, 569	133, 315	74, 058	20, 233	457, 405	685, 011	817, 580	3. 09
Grand total	73, 397	273, 769	4, 456, 049	5, 284, 062	2, 912, 580	12, 999, 857	3, 597, 769	2, 332, 178	2, 896, 086	4, 660, 367	13, 486, 400	26, 486, 257	100. 00

[1] Includes "Local sales."

[2] Shipments to other States generally referred to as being in the South Atlantic area are included in "All other States."

[3] Shipments to Indiana are included in "All other States."

[4] According to data of the U. S. Department of Commerce, exports of Pennsylvania anthracite to non-Canadian destinations totaled 1,000,558 net tons.

Size data for the 1955–56 coal year indicated a 5-percent decline from the preceding coal year in total shipments of Pea and larger sizes whereas shipments of Buckwheat No. 1 and smaller sizes showed an increase of nearly equal proportion. The smaller sizes comprised 51 percent of the total. Truck shipments represented 29 percent of the total and equaled 7,568,000 net tons—a 7-percent increase over the 1954–55 coal year. Rail shipments declined 3 percent to 18,919,000 tons.

Monthly distribution data released by the Pennsylvania Department of Mines (tables 32 and 33) indicate that, for the 1956 calendar year, small percentage increases occurred in both rail and truck shipments of Pennsylvania anthracite. These increases were induced by the upturn in output, but the improvement in the volume of coal moved from the preparation plants by rail was due entirely to the sharp increase in the movement of anthracite to overseas destinations, since rail shipments to both American and Canadian points were below those in 1955. Truck distribution remained virtually unchanged, except for shipments to New York, which were 19 percent greater than in 1955.

TABLE 32.—Rail shipments of Pennsylvania anthracite, 1953–56, by destinations, in net tons [1]

[Pennsylvania Department of Mines]

Destination	1953	1954	1955	1956
New England States	2,067,189	1,809,622	1,771,427	1,574,898
New York	6,889,624	5,646,750	5,411,825	4,793,285
New Jersey	3,487,560	3,169,972	2,849,526	2,529,223
Pennsylvania	5,846,542	4,999,277	4,381,062	4,735,222
Delaware	184,665	152,644	138,733	108,308
Maryland	290,852	250,372	257,795	277,378
District of Columbia	101,911	87,690	73,543	66,121
Virginia	66,482	56,663	59,094	37,992
Ohio	97,346	118,520	300,246	417,813
Indiana	30,969	29,545	41,660	51,692
Illinois	107,618	96,928	107,852	115,143
Wisconsin	155,481	161,271	145,939	128,753
Minnesota	25,052	11,646	22,024	21,965
Michigan	93,024	80,566	75,239	83,907
Other States	160,971	156,176	129,210	133,495
Total United States	19,605,286	16,827,642	15,765,175	15,075,195
Canada	2,541,269	2,271,981	2,203,474	2,091,718
Other foreign countries	73,206	250,808	388,621	1,567,842
Grand total	22,219,761	19,350,431	18,357,270	18,734,755

[1] Does not include dredge coal.

New England receipts of anthracite continued to decline. As indicated in tables 2 and 34, rail receipts declined 6 percent, while the volume moved by tidewater almost doubled after dropping to an all-time low of 5,000 tons in 1955. In recent years imports into that area have been negligible.

According to reports of the Ore and Coal Exchange, Cleveland, Ohio, loadings of anthracite over Lake Erie docks increased 26 percent in 1956. The total for the shipping season (normally, April through November) was not only the highest since 1950 but exceeded 1954 by more than 100 percent. Lake Ontario loadings again were insignificant—totaling less than 1,000 tons for the year. Detailed statistics on various aspects of the Lake trade in anthracite are shown in table 2.

TABLE 33.—Truck shipments of Pennsylvania anthracite in 1956, by months and by States of destination, in net tons [1]

Destination	January	February	March	April	May	June	July
Pennsylvania:							
Within region	520,712	386,041	444,029	400,508	335,069	279,692	216,933
Outside region	222,393	183,535	186,225	161,457	142,290	136,644	114,564
New York	100,648	77,545	100,457	93,472	90,246	97,630	82,935
New Jersey	81,720	58,216	60,885	75,561	52,042	58,160	44,908
Delaware	3,919	4,141	2,464	2,223	1,343	1,768	1,451
Maryland	10,554	9,427	7,957	5,693	3,152	4,158	3,499
District of Columbia	858	441	252	111	53	207	190
Other States	1,375	996	795	898	825	472	702
Total: 1956	942,179	720,342	803,064	739,923	625,020	578,731	465,182
1955	870,074	839,351	648,443	676,065	585,686	585,984	428,524

Destination	August	September	October	November	December	Total	Percent of total trucked
Pennsylvania:							
Within region	262,602	342,597	341,333	390,383	389,872	4,309,771	52.2
Outside region	146,800	172,005	181,516	168,860	148,915	1,965,204	23.8
New York	93,131	93,005	115,151	94,337	91,101	1,129,658	13.7
New Jersey	55,479	63,927	69,412	53,146	52,107	725,563	8.8
Delaware	1,174	1,765	3,277	2,859	2,527	28,911	.4
Maryland	4,823	6,539	7,103	7,032	7,785	77,722	.9
District of Columbia	215	503	275	361	313	3,779	.1
Other States	1,100	957	1,520	1,088	1,011	11,739	.1
Total: 1956	565,324	681,298	719,587	718,066	693,631	8,252,347	100.0
1955	502,345	636,211	601,976	773,890	901,749	8,050,298	100.0

[1] Compiled from reports of Pennsylvania Department of Mines; does not include dredge coal.

TABLE 34.—Receipts of anthracite in New England, 1917, 1920, 1923, 1927, and 1941–56, in thousand net tons

Year	Receipts by tidewater	Receipts by rail [1]	Imports [2]	Total receipts of Pennsylvania anthracite [3]	Year	Receipts by tidewater [4]	Receipts by rail [1]	Imports [2]	Total receipts of Pennsylvania anthracite [3]
1917	[1] 4,421	7,259	1	11,679	1947	240	4,498	----------	4,738
1920	[1] 3,521	7,804	1	11,324	1948	217	4,646	----------	4,863
1923	[1] 4,082	8,102	145	12,039	1949	110	3,336	----------	3,446
1927	[1] 2,421	6,725	106	9,040	1950	81	3,615	18	3,678
1941	[1] 682	4,870	75	5,477	1951	66	3,135	27	3,174
1942	[4] 581	5,393	139	5,835	1952	70	2,847	29	2,888
1943	[4] 575	5,310	164	5,721	1953	49	2,088	31	2,106
1944	[4] 398	5,836	12	6,222	1954	10	1,893	6	1,897
1945	[4] 331	4,750	(5)	5,081	1955	5	1,713	(5)	1,718
1946	[4] 399	5,244	----------	5,643	1956	10	1,610	(5)	1,620

[1] Commonwealth of Massachusetts, Division on the Necessaries of Life.
[2] U. S. Department of Commerce.
[3] Total receipts by rail and by tidewater less imports.
[4] Association of American Railroads.
[5] Less than 500 tons.

CONSUMPTION

Although production of Pennsylvania anthracite in 1956 increased 10 percent over 1955, apparent consumption in the United States (calculated on the basis of production, exports, imports, and changes in producers' stocks) went up only 2 percent; therefore, the net gain in output (2,700,000 tons) between the 2 years was attributable principally to an increase of 2,100,000 tons in total exports. In contrast with 1954 and 1955, when substantial quantities of anthracite were withdrawn from both retail-dealer and producer stockpiles, to meet total demand, production in 1956 appeared to be more nearly commensurate with demand, since the drawdown in producer stocks was almost matched by the increase in retail-dealer inventories.

The small increase indicated in consumption for the United States undoubtedly was due to stepped-up demand for commercial and industrial uses rather than for domestic or space-heating purposes. This conclusion is supported by the fact that relatively no change occurred in the quantity of anthracite delivered to consumers by retail dealers in the 2 years. According to monthly estimates prepared by the Bureau of Mines from a mail canvass of selected retail dealers, 13,018,000 tons was delivered through retail yards in 1956 compared with 13,019,000 tons in the preceding year.

TABLE 35.—Apparent consumption of anthracite and selected competitive fuels in the principal anthracite markets, 1953–56

(Thousand net tons)

Fuel	New England	New York	New Jersey	Pennsylvania	Delaware	Maryland	District of Columbia	Total	Percent of total fuels
Anthracite (all users):[1]									
1953	2,067	[2] 7,502	[2] 3,968	11,405	204	333	102	25,581	25.0
1954	1,809	[2] 6,361	[2] 3,743	10,878	169	320	90	23,370	21.6
1955	1,771	[2] 6,359	[2] 3,602	10,618	157	328	81	22,916	19.9
1956	1,575	[2] 5,923	[2] 3,255	11,010	137	355	70	22,325	18.5
Imported:[3]									
1953	31	----	----	----	----	----	----	31	(4)
1954	6	----	----	----	----	----	----	6	(4)
1955	(5)	----	----	----	----	----	----	(5)	(4)
1956	(5)	----	----	----	----	----	----	(5)	(4)
Briquets (domestic use):									
1953	27	9	22	16	(5)	12	1	87	.1
1954	21	8	8	13	----	9	1	60	.1
1955	19	6	1	10	(5)	7	1	44	(4)
1956	17	6	1	9	(5)	6	1	40	(4)
Coke (domestic use):									
1953	439	200	259	126	(5)	(5)	----	1,024	1.0
1954	379	179	241	102	(5)	(5)	----	901	.8
1955	384	122	235	96	(5)	----	----	837	.7
1956	334	70	202	87	(5)	----	----	693	.6
Imported:[3]									
1953	1	18	----	----	----	----	----	19	(4)
1954	1	1	----	----	----	----	----	2	(4)
1955	2	3	----	----	----	----	----	5	(4)
1956	7	12	----	----	----	----	----	19	(4)
Oil (heating and range):[6]									
1953	21,354	17,099	8,655	7,130	630	3,136	1,162	59,166	57.7
1954	23,199	18,051	9,034	8,030	725	3,897	1,217	64,153	59.2
1955	24,564	20,028	9,808	8,810	812	4,234	1,284	69,540	60.3
1956	25,789	20,402	10,253	9,186	911	4,617	1,317	72,475	60.2
Natural gas:[7]									
1953	837	5,934	1,272	7,028	(8)	(8)	[8] 1,542	16,613	16.2
1954	1,604	7,045	1,608	7,824	(8)	(8)	[8] 1,784	19,865	18.3
1955	1,873	7,761	1,971	8,518	(8)	(8)	[8] 1,965	22,088	19.1
1956	2,252	8,633	2,366	9,382	(8)	(8)	[8] 2,243	24,876	20.7
Total:									
1953	24,756	30,762	14,176	25,705	[9] 834	[9] 3,481	[9] 2,807	102,521	100.0
1954	27,019	31,645	14,634	26,847	[9] 894	[9] 4,226	[9] 3,092	108,357	100.0
1955	28,613	34,279	15,617	28,052	[9] 969	[9] 4,569	[9] 3,331	115,430	100.0
1956	29,974	35,046	16,077	29,674	[9] 1,048	[9] 4,978	[9] 3,631	120,428	100.0

[1] Pennsylvania Department of Mines.
[2] An important but undetermined part of anthracite shown as shipped to New Jersey is reshipped to New York City.
[3] U. S. Department of Commerce.
[4] Less than 0.05 percent.
[5] Less than 500 tons.
[6] Converted to coal equivalent upon basis of 4 barrels of fuel oil equaling 1 ton of coal.
[7] Converted to coal equivalent upon basis of 24,190 M cubic feet of natural gas equaling 1 ton of coal.
[8] Delaware and Maryland included with District of Columbia.
[9] Natural gas for Delaware and Maryland included with District of Columbia.

Consumption of anthracite by electric utilities again increased and was 3 percent higher than in 1955. Consumption by class I railroads dropped almost 11 percent in 1956. The percentage decline in rail consumption in 1956 appears large, but the net loss was less than 50,000 tons.

The quantity of anthracite used in cokemaking generally cannot be correlated directly with total coke production owing in part to its increasing use in recent years. For example, in 1956 coke production declined 1 percent whereas the quantity of anthracite used in cokemaking increased to approximately 377,000 tons (3 percent). The demand for fuel briquets in the United States continued to decline in 1956 as production fell 7 percent under that of 1955. As a result, the quantity of Pennsylvania anthracite used in making briquets declined to 228,000 tons compared with 264,000 tons in 1955.

Detailed data on the consumption of all fuels in the primary anthracite market area are not available; however, statistics on the apparent consumption of anthracite, briquets, domestic coke, heating and range oils, and natural gas in this area will be found in table 35.

STOCKS

For the first time since the Bureau of Mines began collecting data on stocks of anthracite in retail yards (1950), the quantity held at the end of a calendar year exceeded that in the preceding year. After declining yearly from 3,452,000 tons in December 1950 to a low point of 1,190,000 tons in the same month of 1955, retail stocks climbed upward in 1956 to a year-end figure estimated at 1,498,000 tons, an increase of approximately 26 percent over 1955. The winter of 1955–56 was the first in eight successive heating seasons in which the degree-day demand for heat exceeded normal in the principal anthracite market areas. As a result of the abnormally cold weather and relatively low stocks in retail yards, spot shortages of certain sizes developed in some areas, and mine shipments were 2 to 3 weeks behind orders. Although the retail trade averted serious difficulty by such expedients as substituting one size for another and mixing two or more sizes, the buildup in retail stocks in 1956 undoubtedly was due to the determination of retail dealers to prevent a recurrence of such conditions by entering the 1956–57 heating season with higher inventories.

After producer stocks reached a postwar peak of 1,929,000 tons in November 1953, the major producing companies began a concerted drive to reduce inventories. Besides representing a tremendous capital investment, the large stocks of anthracite held in ground storage tended to retard production and contributed heavily to the disturbed f. o. b. mine-price situation. As a result of these efforts, total producer stocks were reduced approximately 623,000 tons in 1954, 573,000 tons in 1955, and 378,000 tons in 1956. The 1956 year-end figure of 342,000 tons was not only 53 percent below 1955 but also was the lowest closing inventory since 1946.

Stocks of Pennsylvania anthracite held by public utilities at the end of December 1956 were 11 percent less than on the same date in 1955. On the basis of 1956 consumption, stocks held at the end of the year represented about a 10-month supply compared with almost a full year's supply on hand at the end of 1955. Class I railroads operated throughout 1956 with extremely low stockpiles of anthracite, with monthly totals ranging from a low of 20,000 tons at the end of March to a high of 43,000 tons in December. Loadings of anthracite at Lake Erie docks again showed a substantial gain, the 1956 volume exceeding 1955 by 26 percent. As the combined stocks at docks on Lakes Michigan and Superior at the end of 1956 increased only slightly over 1955, the substantial net gain in shipments indicated a continuing strong demand for anthracite in the upper Lakes area, particularly for metallurgical uses.

FOREIGN TRADE [2]

Only 46 tons of anthracite was imported into the United States in 1956, according to the foreign trade data of the United States Department of Commerce. After averaging approximately 345,000 tons for the first 8 months of the year, exports increased sharply in September and continued high for the last quarter of the year—averaging about 621,000 tons for the 4 months. As a result, total exports climbed to 5,244,000 tons—66 percent over 1955 and the largest yearly total since 1951. Of the 1956 total, 2,356,000 tons was exported to Canada and the remainder to overseas destinations, principally Western Europe. As these data indicate a decline of about 79,000 tons in shipments to Canada, the improvement was attributable almost entirely to the increased demand in Europe.

TABLE 36.—Anthracite imported for consumption in the United States, 1955–56, by countries and customs districts, in net tons

[Bureau of the Census]

Country	1955	1956	Customs district	1955	1956
North America: Canada	170	46	Maine and New Hampshire	170	46
Total	170	46	Total	170	46

The 2,723,000 tons exported to European countries in 1956 not only represented an increase of approximately 2,132,000 tons over 1955 but was the second largest yearly total in the history of the anthracite industry—exceeded only by the 3,918,000 tons exported to Europe in 1947. Four countries in order—Netherlands, France, Belgium, and Italy—were the leading importers of American anthracite, taking 94 percent of the European total. Cuba and South Viet Nam also took significant quantities. Although competent authorities predict a growing market for American coal in European markets owing to a widening gap between indigenous production and requirements, the future of anthracite is less predictable. Because of the relatively mild winter of 1956–57, considerable stocks of space-heating anthracite were carried over. These stocks are expected to exert a somewhat depressing effect upon 1957 purchases and restrict imports of Pennsylvania anthracite to a range of 2,750,000–3,000,000 tons for 1957. Detailed data on exports are presented in table 37.

[2] Figures on imports and exports compiled by Mae B. Price and Elsie D. Page, Division of Foreign Activities, Bureau of Mines, from records of the Bureau of the Census.

TABLE 37.—Anthracite exported from the United States, 1955–56, by countries and customs districts, in net tons

[Bureau of the Census]

Country	1955	1956
North America:		
Bermuda	334	110
Canada	2,434,981	2,356,351
Cuba	62,125	69,575
Jamaica	229	290
Mexico	1,692	428
Trinidad and Tobago		100
Total	2,499,361	2,426,854
South America:		
Argentina		7,579
Bolivia		24
Brazil	840	10,352
Peru		60
Uruguay		537
Total	840	18,552
Europe:		
Belgium-Luxembourg		326,828
Denmark	2,843	
Finland		10,905
France	119,164	860,961
Germany, West	18,081	97,872
Greece		36,372
Italy	150,511	194,202
Netherlands	300,696	1,175,931
Norway	15	10,713
Switzerland		9,627
United Kingdom		20
Total	591,310	2,723,431
Asia:		
Israel	28,061	12,493
Japan		15,497
Vietnam, Laos, and Cambodia	32,741	47,522
Total	60,802	75,512
Grand total	3,152,313	5,244,349

Customs district	1955	1956
North Atlantic:		
Connecticut		124
Maine and New Hampshire	3,751	188
Massachusetts	63	107
New York	11,153	12,030
Philadelphia	709,509	2,876,839
South Atlantic:		
Maryland	548	504
Virginia	229	1,194
Gulf Coast:		
New Orleans		204
Sabine	292	382
Mexican border:		
Arizona	55	
Laredo	1,337	423
Pacific Coast: Los Angeles		5
Northern border:		
Buffalo	1,568,602	1,188,413
Dakota	437	105
Duluth and Superior	5,019	11,071
Michigan	790	793
Montana and Idaho		31
Ohio	10,106	16,360
Rochester	4,285	697
St. Lawrence	796,663	556,142
Vermont	37,704	30,837
Miscellaneous [1]	1,770	547,900
Total	3,152,313	5,244,349

[1] District breakdown not available.

In 1956 the Bureau of Mines, through a cooperative agreement with the Bureau of the Census, United States Department of Commerce, began publishing monthly estimates of the sizes of anthracite shipped to overseas destinations. From these data, plus estimates of Canadian imports based upon the coal-year distribution canvass, about 22 percent of the total 1956 production of Pea and larger sizes was sold abroad. Aside from its apparent salutary effect upon production and employment, the importance of this movement to the industry was twofold. First, the most pronounced loss to competitive fuels in the domestic market occurred in the space-heating field, where the large sizes of anthracite are used most widely; therefore, the export market not only provided an outlet for a considerable quantity of sizes, which undoubtedly could not have been disposed of profitably in the United States, but also, to some extent, has deferred the necessity of crushing the larger sizes to obtain additional quantities of the smaller coals. Second, the production of large-size coal for export resulted in the output of substantial tonnages of anthracite fines, which otherwise would not have been available. Exports in 1956 represented slightly more than 18 percent of the year's output—more than 1 ton of each 6 tons produced. About 81 percent of the exports to Canada consisted of Pea and larger sizes, whereas these sizes accounted for only about 40 percent of the exports to overseas destinations.

Canada again lowered total imports of anthracite—taking 2,546,000 net tons in 1956 as compared with 2,646,000 tons in 1955. Of the 1956 total, the Dominion Bureau of Statistics indicates 2,392,000 tons were imported for consumption (not comparable with United States export data) from the United States and 153,000 tons from Great Britain, the latter a decline of 43 percent from the preceding year. Significantly, export data released in the Accounts Relating to the Trade and Navigation of the United Kingdom indicate that British exports of anthracite declined from 1,715,000 metric tons in 1955 to 1,634,000 in 1956. As the decline in exports to Canada was approximately the same degree, British exports of anthracite to the Continent and the Mediterranean area appeared to be approximately the same as in 1955. However, in view of the British coal industry's difficulty in meeting increased domestic and foreign demand, no immediate recovery in British exports of anthracite can be expected.

A sharp increase in exports of coal to Western Europe was a feature of the solid-fuel trade of the U. S. S. R. in 1956. Based on data published in the ECE Coal Market Review, May 1957, the U. S. S. R. exported 2.5 million metric tons to Western Europe (including Yugoslavia and Finland), as compared with 1.4 million tons in 1955. Of the 1956 total, 1,426,000 metric tons was classified as anthracite (the larger part of which was presumably shipped from the Donetz basin). France was the largest importer of Russian anthracite in 1956, with 623,000 metric tons, followed by Italy, 219,000 tons; Finland, 143,000 tons; and the Netherlands, 129,000 tons. In the 50,000 to 100,000-ton category were such countries as Belgium, Sweden, Switzerland, and Yugoslavia.

WORLD PRODUCTION

World production of anthracite totaled nearly 156,000,000 net tons in 1956 an increase of approximately 8 percent. Of the countries reporting increased output, the most significant on the basis of absolute gain were the United States, up 10 percent over 1955; the U. S. S. R., 9 percent; and West Germany, also 9 percent. Great Britain in 1956 again experienced difficulty in maintaining output of Welsh anthracite; the year's total dropped 5 percent under that in 1955.

Details on world production of anthracite for 1952–56 are presented in table 38. As noted, this table contains a number of revisions of previously published data, the most important of which concerns the U. S. S. R. Previously, Russian production was estimated because no official statistics were available; recently, however, anthracite-production data have been released in various official Government publications. Except for 1956, the statistics for the U. S. S. R. represent official figures.

TABLE 38.—World production of anthracite, 1952–56, by countries, in thousand short tons [1]

[Compiled by Pearl J. Thompson]

Country	1952	1953	1954	1955	1956
Belgium	7,572	7,893	7,781	7,947	7,675
Bulgaria [2]	33	33	33	33	33
China [2]	4,400	4,400	5,000	5,000	5,500
France	11,268	10,950	11,894	12,077	12,033
French Morocco	507	623	536	515	531
Germany:					
East [2]	260	270	270	275	275
West	9,776	10,692	11,556	12,378	13,453
Ireland	121	127	170	151	[2] 172
Italy	89	75	71	53	60
Japan	1,111	1,215	1,376	1,495	1,559
Korea:					
North [2]	850	1,100	1,200	1,300	1,500
Republic of	635	956	982	1,442	2,003
New Zealand	1	2	2	2	2
Peru	88	76	86	18	11
Portugal	487	527	476	445	456
Rumania [2]	55	55	55	55	55
Spain	2,024	2,150	2,165	2,159	2,518
Switzerland [2]	11	11	11	11	11
U. S. S. R	51,524	54,235	58,324	66,974	[2] 73,100
United Kingdom	4,686	4,705	5,013	4,890	4,662
United States (Pennsylvania)	40,583	30,949	29,083	26,205	28,900
Viet-Nam, North	948	978	1,099	1,213	1,213
World total (estimate)	137,000	132,000	137,200	144,600	155,700

[1] This table incorporates a number of revisions of data published in previous anthracite tables. Data do not add to totals shown owing to rounding where estimated figures are included in the detail.
[2] Estimate.
NOTE: An undetermined quantity of semianthracite is included in the figures for some countries.

TECHNOLOGY

Research on anthracite has been concerned principally with improving and developing more efficient mining methods and equipment, preparation methods, the investigation of new uses and a study of the composition and characteristics of anthracite.

Mining.—Further improvements were made in the vibrating-blade coal planer developed by the Bureau of Mines, and arrangements were completed to use the planer and related transport and roof-support equipment on a full-scale longwall-face operation. A scraper-shaker-loader, designed and built by the Bureau, was being tested in driving a rock slope to open a new area in an anthracite mine.

Additional tests of a pneumatic packing machine in a pillar section of a mine disclosed an average packing rate of 36.7 tons of refuse per hour and a maximum rate of 49.5 tons per hour. However, with adequate supplies of compressed air and packing material, an estimated packing rate of 94.5 tons per hour would have been possible. The effectiveness of this method of backfilling for controlling overburden movement could not be observed, as plans for pillar recovery in the section were abandoned.

Experiments with yielding steel props combined with mechanical backfilling in a pillar-robbing mine section showed that, in comparison with conventional timbering, the yielding props required one-third less time for installation, improved output per man-shift by one-third, and coal recovery by 9 percent. The mechanical backfilling left voids averaging only 30 percent in the filled excavations whereas backfilling with the usual shaker conveyors left the space 66-percent void. Details of these tests are reported in Bureau of Mines Report of Investigations 5273 and 5290.

A new 6-foot-diameter rotary drill with an extendable-boom shaft and a slope-mucking machine have been developed for driving shafts. The driving mechanism of the rotary drill is an integral part of the drilling apparatus and follows the cutting-head to the bottom of the hole. The cutting head is equipped with 12 to 14 tricone bits from which the cuttings are removed by vacuum. The shaft mucker has an air-operated, telescopic boom with air-operated clamshell jaws, which supply positive pressure at the point of loading as well as positive positioning and loading of the hoist bucket. The boom has a retracted length of 17 feet and extended length of 32 feet. It is mounted on the bottom of a cage at one end of which the operator works. These machines and other new equipment were described by Pierce in the April 1956 issue of Mining Congress Journal.

Mine-Water Control.—Under the joint Federal-State program for controlling mine water in anthracite mines, studies of problem areas and detailed appraisals of proposed projects were made in the Bureau of Mines Anthracite Experiment Station at Schuylkill Haven, Pa. By the close of the year, two projects for mine pumps had been approved and were near the contract stage. Other projects requiring either mine pumps or surface improvements to stream beds were in the final stages of preparation for submittal for approval.

Preparation.—The October 1956 issue of Coal Age (p. 90) reported that an anthracite company modernized its preparation plant by installing a double-hulled dense-medium tank, which takes feed sized between 2⅝ inches and 3/16 inch (Stove through Rice sizes). The only major moving part is the rake, which removes the rejects. The removal of several classifier-type cleaners, multiple-deck shaker screens, and chutes has resulted in lower maintenance and labor costs.

Coal Age, February 1957, reported that new cleaning equipment installed at anthracite operations had a capacity of 1,416 tons per hour. This equipment was installed in 10 preparation plants some of which were old. The first fluidized-bed, fine-coal drier went into service in 1956. It reduces surface moisture from 11 percent to 2 percent at a feed rate of 85 tons per hour. Drying of fine coal in a fluidized bed offers the advantages of large capacities with low air volumes and velocities in single units controlled by instrumentation. Equipment is through the development stage and is now on the market.

Utilization.—The Bureau of Mines at the Southern Experiment Station, Tuscaloosa, Ala., found that additions of up to 15 percent of anthrafines to coking coals and blends resulted in larger size, increased resistance to shatter, and higher specific gravity in the finished coke. The large variety of results obtained by varying the proportion and grade of the anthrafines suggests that the anthrafines would be useful in producing coke to meet any given set of specifications. The experimental work is reported in Bureau of Mines Report of Investigations 5287.

Coke and Coal Chemicals

By J. A. DeCarlo, T. W. Hunter, and Maxine M. Otero

Contents

GENERAL SUMMARY

PRODUCTION of coke in the United States in 1956 exceeded 74 million tons for the sixth time on record. The 1956 output was 1 percent lower than in 1955 and 6 percent below the alltime high of 1951 but was 5 percent above the average for 1947–49. Production slightly decreased from 1955 because of the work stoppage in the iron and steel industry, from July 1 to August 5, which adversely affected coke-oven operations. During this period most furnace oven-coke plants were forced to bank their ovens or to operate at reduced rates, and some merchant oven-coke plants had to curtail coke production because demand for their blast-furnace coke was lacking. The rate of coke production for furnace plants during the 35-day work stoppage was only 27 percent of capacity, whereas merchant plants produced at 71 percent of capacity. In spite of these low operating rates during the steel strike, the production rate of all oven-coke plants for the entire year was 90 percent compared with 93 percent in 1955.

Production of beehive coke in 1956 continued at about the same rate as in the last quarter of 1955, but total output was 43 percent higher because of low production during the first half of 1955. Beehive ovens, which have served as marginal producers of coke since the end of World War I, supplied only 3 percent of our national output in 1956. All but a small part of the beehive production was used by iron blast furnaces for smelting iron ore.

The rise in industrial activity that began in the latter part of 1955 continued generally throughout 1956 and kept metallurgical-coke requirements high. Production of coke paralleled demand, and only ½ million tons was added to producers' inventories during the year. The uses were about the same as in previous years; blast furnaces and foundries consumed the greater part of the total output. Shipments of oven and beehive coke to iron blast furnaces amounted to 90 percent of all coke used and sold by producers. Data compiled and published by the American Iron and Steel Institute on materials used by blast furnaces in manufacturing pig iron and ferroalloys showed that only 1,719.1 pounds of coke was consumed per ton of metal produced. This figure was the lowest on record and indicated progress in pig-iron technology.

Iron foundries utilized 4 percent of all coke shipments in 1956; this quantity was about the same as in 1955. Coke for manufacturing producer gas and water gas, declining steadily in the past decade, continued to fall and represented but 2 percent of the total. Distribution of coke for all other industrial purposes totaled 3 percent; shipments to the residential heating trade amounted to 1 percent.

The annual coke capacity of oven-coke plants changed slightly in 1956. Although 302 new ovens with an annual coke capacity of 1,758,200 net tons were placed in operation, 418 old ovens did not produce because they were being rebuilt or were permanently abandoned. As a result, slot-type ovens in existence on December 31, 1956, were 116 fewer than at the end of 1955. In spite of the decline in the total number of ovens, annual capacity increased 289,600 net tons because of larger capacities for the new ovens. The total capacity failed to reach 80 million tons by the end of the year, but the expansion and modernization of coke-making facilities continued high, and 631 ovens with an annual coke capacity of more than 3.3 million tons were being constructed. The construction and modernization program of ovens at furnace plants during the past 10 years resulted in marked improvement in their coking facilities. More than two-fifths of all ovens operating at furnace plants at the end of the year were less than 10 years old. Merchant plants, however, have not replaced their ovens of which only 15 percent were under 10 years old.

Production of basic coal-chemical materials (coke-oven gas, ammonia, crude coal tar, and crude light oil) also declined, but the decreases were generally proportionate to the decline in coke production. Coke-oven gas decreased 3 percent; ammonia, 7 percent; and crude tar and crude light oil, 2 percent each. Two additional coke plants began making diammonium phosphate in place of ammonium sulfate. This increased the number of oven-coke plants making diammonium phosphate to three, and annual statistics on this commodity are shown for the first time.

In general, sales of coal chemicals paced production, and in several instances inventories were reduced. Ammonium sulfate sales were higher than production in the spring and late fall, which caused the unusually high inventories at the beginning of the year to be reduced. Declining production of phthalic anhydride greatly reduced the demand for the higher grade of crude naphthalene (76° to 79° C.), and stocks of this material increased thirty-fold by year end. Sales of light-oil derivatives (benzene, toluene, xylene, and solvent naphtha) paralleled output, and inventories of these commodities changed only slightly during the year.

The prices of light-oil and tar derivatives changed slightly. The price of crude tar, however, increased from $0.115 to $0.120 a gallon, but ammonium sulfate prices dropped sharply in May. The average price of ammonium sulfate per ton was reduced from $38.00 in 1955 to $32.00 in 1956. The value of coal-chemical materials sold, including

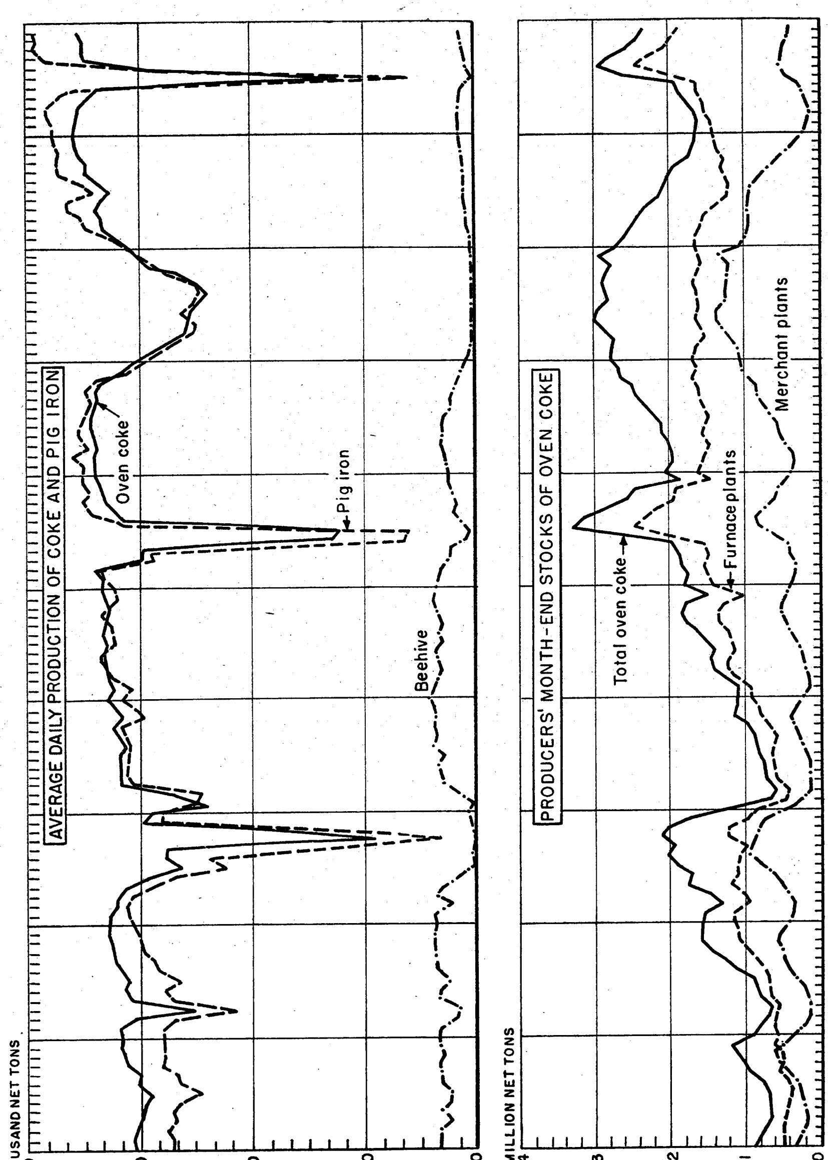

FIGURE 1.—Average daily production of oven and beehive coke and pig iron and producers' stocks of oven coke, 1947–56, by months.

surplus gas used by producing companies, decreased nearly $7 million from 1955 and totaled $341,628,908.

The total value of coal carbonized totaled more than $980 million, and the value of all coke-oven products used and sold amounted to $1.7 billion. This value was the highest ever reported for coke-oven products, principally because of the rise in coke prices. Coke, including breeze, furnished 78 percent of the dollar value of all products; coal-chemical materials supplied only 22 percent of the total.

TABLE 1.—Salient statistics of the coke industry in the United States, 1947–49 (average) and 1955–56

	1947–49 (average)	1955	1956
Coke produced:			
Oven net tons	65,088,462	73,584,214	71,992,242
Beehive do	5,559,940	1,717,612	2,462,022
Total do	70,648,402	75,301,826	74,454,264
Distribution, all coke sold or used:			
To blast-furnace plants do	56,145,621	68,171,966	66,311,598
To foundries do	3,393,176	3,253,927	2,951,776
To other industrial plants (including producer and water gas) net tons	7,391,615	3,848,674	3,639,131
For residential heating do	3,392,826	1,126,065	912,436
Imports, all coke do	181,000	126,342	130,955
Exports, all coke do	696,502	530,505	655,717
Apparent consumption, all coke do	69,852,671	76,145,732	73,295,832
Producers' stocks of coke, Dec. 31 do	[1] 1,769,456	1,700,771	2,334,441
Value of coal-chemical materials sold or used	$254,681,622	$388,437,984	$383,354,279
Value of coke and breeze produced	867,047,809	1,247,020,919	1,335,504,484
Total value of all products	1,121,729,431	1,635,458,903	1,718,858,763

[1] 1949.

TABLE 2.—Statistical summary of the coke industry in the United States in 1956

	Slot-type ovens	Beehive ovens	Total
Coke produced—			
At merchant plants:			
Net tons	9,575,194	(2)	(2)
Value	$175,633,398		
At furnace plants: [1]			
Net tons	62,417,048		
Value	$1,098,580,382		
Total:			
Net tons	71,992,242	2,462,022	74,454,264
Value	$1,274,213,780	$34,849,286	$1,309,063,066
Breeze produced:			
Net tons	4,771,813	91,408	4,863,221
Value	$26,207,396	$234,022	$26,441,418
Coal carbonized:			
Bituminous:			
Net tons	101,871,422	4,043,383	105,914,805
Value	$952,526,282	$24,226,023	$976,752,305
Average per ton	$9.35	$5.99	$9.22
Anthracite:			
Net tons	377,311		377,311
Value	$3,352,524		$3,352,524
Average per ton	$8.89		$8.89
Total:			
Net tons	102,248,733	4,043,383	106,292,116
Value	$955,878,806	$24,226,023	$980,104,829
Average per ton	$9.35	$5.99	$9.22
Average yield in percent of total coal carbonized:			
Coke	70.41	60.89	70.05
Breeze (at plants actually recovering)	4.67	3.66	4.64

See footnotes at end of table.

TABLE 2.—Statistical summary of the coke industry in the United States in 1956—Continued

	Slot-type ovens	Beehive ovens	Total
Ovens:			
In existence Jan. 1	16,039	10,104	26,143
In existence Dec. 31	15,923	9,549	25,472
Dismantled during year	418	[3] 735	1,153
In course of construction Dec. 31	631	18	649
Annual coke capacity Dec. 31 net tons	79,965,100	5,765,700	85,730,800
Coke used by producing companies:			
In blast-furnace plants:			
Net tons	59,577,960	335,531	59,913,491
Value	$1,051,966,687	$4,858,485	$1,056,825,172
In foundries:			
Net tons	251,199		251,199
Value	$6,521,783		$6,521,783
For producer-gas manufacture:			
Net tons	172,796		172,796
Value	$2,542,612		$2,542,612
For water-gas manufacture:			
Net tons	848,915		848,915
Value	$9,234,267		$9,234,267
For other industrial purposes:			
Net tons	515,258		515,258
Value	$9,112,187		$9,112,187
Coke sold (commercial sales):			
To blast-furnace plants:			
Net tons	4,663,480	1,734,627	6,398,107
Value	$73,205,795	$24,313,571	$97,519,366
To foundries:			
Net tons	2,659,236	41,341	2,700,577
Value	$70,478,947	$685,419	$71,164,366
To water-gas plants:			
Net tons	90,113	29	90,142
Value	$1,593,789	$458	$1,594,247
To other industrial plants:			
Net tons	1,676,424	335,596	2,012,020
Value	$23,753,295	$4,803,318	$28,556,613
For residential heating:			
Net tons	905,920	6,516	912,436
Value	$14,764,253	$80,881	$14,845,134
Disposal of breeze:			
Used by producing companies:			
For steam raising:			
Net tons	2,423,147		2,423,147
Value	$12,541,581		$12,541,581
For sintering iron ore:			
Net tons	575,605	16,081	591,686
Value	$3,218,983	$48,243	$3,267,226
For other industrial purposes:			
Net tons	441,460	2,089	443,549
Value	$2,249,095	$6,267	$2,255,362
Sold (commercial sales):			
Net tons	1,123,658	73,281	1,196,939
Value	$7,231,372	$179,613	$7,410,985
Average receipts per ton (commercial sales):			
Blast-furnace coke	$15.70	$14.02	$15.24
Foundry coke	$26.50	$16.58	$26.35
Water-gas coke	$17.69	$15.79	$17.69
Other industrial coke	$14.17	$14.31	$14.19
Residential heating coke	$16.30	$12.41	$16.27
Breeze	$6.44	$2.45	$6.19
Producers' stocks, Dec. 31:			
Blast-furnace coke net tons	2,014,528	10,431	2,024,959
Foundry coke do	63,067		63,067
Residential heating and other coke do	244,980	1,435	246,415
Breeze do	940,902	144	941,046
Coal-chemical materials produced:			
Tar, crude gallons	832,827,042		832,827,042
Ammonium sulfate or equivalent [4] pounds	1,949,604,164		1,949,604,164
Gas M cubic feet	1,055,328,682		1,055,328,682
Burned in coking process percent	35.10		35.10
Surplus sold or used do	62.88		62.88
Wasted do	2.02		2.02
Crude light oil gallons	290,972,209		290,972,209
Yield of coal-chemical materials per ton of coal:			
Tar, crude gallons	8.15		8.15
Ammonium sulfate or equivalent [4] pounds	19.28		19.28
Gas M cubic feet	10.32		10.32
Crude light oil gallons	2.92		2.92

See footnotes at end of table.

TABLE 2.—Statistical summary of the coke industry in the United States in 1956—Continued

	Slot-type ovens	Beehive ovens	Total
Value of coal-chemical materials sold or used:			
Tar, crude:			
Used by producers as fuel [5]	$41,725,371		$41,725,371
Sold	$50,128,897		$50,128,897
Ammonia (sulfate and liquor) [4]	$32,202,457		$32,202,457
Gas (surplus)	$151,481,650		$151,481,650
Crude light oil and derivatives	$78,995,552		$78,995,552
Other coal-chemical materials [6]	$28,820,352		$28,820,352

[1] Plants associated with iron blast furnaces (refer to definition in Scope of Report).
[2] Not separately recorded.
[3] Idle and not expected to resume production; removed from list of available ovens.
[4] Includes diammonium phosphate and ammonium thiocyanate.
[5] Includes pitch-of-tar.
[6] Naphthalene, tar derivatives, and miscellaneous materials.

TABLE 3.—Summary of coke-oven operations in the United States in 1956, by States

State	Oven coke						
	In existence Dec. 31 [1]		Coal carbonized (net tons)	Yield of coke from coal (percent)	Coke produced (net tons)	Value of coke at ovens	
	Plants	Ovens				Total	Per ton
Alabama	7	1,424	7,879,210	73.15	5,763,749	$111,219,091	$19.30
California	1	225	1,688,287	61.15	1,032,375	(2)	(2)
Colorado	1	256	1,131,129	66.17	748,440	(2)	(2)
Illinois	7	625	3,938,156	71.16	2,802,223	51,791,553	18.48
Indiana	5	2,165	12,361,784	72.16	8,920,369	186,181,917	20.87
Maryland	1	687	4,198,946	72.65	3,050,420	(2)	(2)
Massachusetts	1	108	852,409	71.33	608,052	(2)	(2)
Michigan	4	691	4,745,766	74.40	3,531,031	67,116,136	19.01
Minnesota	3	241	1,401,792	72.23	1,012,564	19,857,956	19.61
New Jersey	2	341	1,624,316	75.30	1,223,050	(2)	(2)
New York	3	831	5,430,386	70.44	3,825,368	58,552,685	15.31
Ohio	16	2,493	16,773,169	70.34	11,799,045	201,232,720	17.06
Pennsylvania	14	3,976	27,929,111	68.38	19,098,406	316,661,062	16.58
Tennessee	1	44	258,460	79.78	206,196	(2)	(2)
Texas	2	140	874,173	73.88	645,830	(2)	(2)
Utah	2	308	2,101,090	63.54	1,334,976	(2)	(2)
West Virginia	5	813	5,993,141	70.04	4,197,403	60,823,375	14.49
Connecticut, Kentucky, Missouri, and Wisconsin	4	555	3,067,408	71.49	2,192,745	37,881,051	17.28
Undistributed						162,896,234	18.41
Total 1956	79	15,923	102,248,733	70.41	71,992,242	1,274,213,780	17.70
At merchant plants	22	2,424	13,179,615	72.65	9,575,194	175,633,398	18.34
At furnace plants	57	13,499	89,069,118	70.08	62,417,048	1,098,580,382	17.60
Total 1955	81	16,039	104,873,873	70.16	73,584,214	1,199,630,173	16.30

See footnotes at end of table.

TABLE 3.—Summary of coke-oven operations in the United States in 1956, by States—Continued

State	Beehive coke						Total	
	Ovens in existence Dec. 31	Coal carbonized (net tons)	Yield of coke from coal (percent)	Coke produced (net tons)	Value of coke at ovens		Coke produced (net tons)	Value of coke at ovens
					Total	Per ton		
Alabama							5, 763, 749	$111, 219, 091
California							1, 032, 375	(2)
Colorado							748, 440	(2)
Illinois							2, 802, 223	51, 791, 553
Indiana							8, 920, 369	186, 181, 917
Maryland							3, 050, 420	(2)
Massachusetts							608, 052	(2)
Michigan							3, 531, 031	67, 116, 136
Minnesota							1, 012, 564	19, 857, 956
New Jersey							1, 223, 050	(2)
New York							3, 825, 368	58, 552, 685
Ohio							11, 799, 045	201, 232, 720
Pennsylvania	7, 873	3, 202, 726	62. 62	2, 005, 590	$27, 713, 371	$13. 82	21, 103, 996	344, 374, 433
Tennessee							206, 196	(2)
Texas							645, 830	(2)
Utah	297	222, 844	50. 60	112, 755	(2)	(2)	1, 447, 731	(2)
Virginia	483	319, 110	52. 01	165, 968	2, 555, 797	15. 40	165, 968	2, 555, 797
West Virginia	703	170, 123	61. 39	104, 440	1, 476, 830	14. 14	4, 301, 843	62, 300, 205
Connecticut, Kentucky, Missouri, and Wisconsin	193	128, 580	56. 98	73, 269	(2)	(2)	2, 266, 014	(2)
Undistributed					3, 103, 288	16. 68		203, 880, 573
Total 1956	9, 549	4, 043, 383	60. 89	2, 462, 022	34, 849, 286	14. 15	74, 454, 264	1, 309, 063, 066
Total 1955	10, 104	2, 869, 212	59. 86	1, 717, 612	22, 231, 455	12. 94	75, 301, 826	1, 221, 861, 628

[1] Excludes plants retired permanently during year.
[2] Included with "Undistributed" to avoid disclosing individual company figures.

SCOPE OF REPORT

Except where otherwise noted, data in this chapter are based on those voluntarily supplied to the Bureau of Mines by coke-producing companies operating within the continental limits of the United States. These data are confined to products made in high-temperature slot-type and beehive-coke ovens and do not include products made by other carbonization processes (coal-gas retorts, low-temperature carbonization of coal, and carbonization of residues from refining crude tar and petroleum). Separate statistics on the production of coke in coal-gas retorts and low- and medium-temperature carbonization equipment are not shown in this chapter; less than three companies employed these processes in the United States in 1956. Production of petroleum coke (including catalyst coke) totaled 6.2 million tons in 1956, and the United States Tariff Commission reported that 21,000 tons of coal-tar-pitch coke was produced.

The coke industry in 1956 consisted of 46 companies that owned and operated 80 oven-coke plants and 49 companies that owned 61 beehive-coke plants. Reports were received from each oven-coke plant and from all but three beehive-coke producers. As submission of these reports is not mandatory, the Bureau of Mines was unable to obtain reports from several small beehive plants that operated spasmodically during the year. Production of coke at these plants was estimated from railroad reports on their carloadings, and coverage of the beehive industry is believed to be complete.

The terms "merchant" and "furnace" plants in this chapter apply only to oven-coke plants. Furnace plants are those that are owned or are financially affiliated with iron and steel companies whose main business is producing coke for use in their own blast furnaces. All other oven-coke plants are classified as merchant and include those that manufacture metallurgical, industrial, and residential heating grades of coke for sale on the open market; coke companies associated with chemical plants or gas utilities; and those affiliated with local iron works, where only a small part (less than 50 percent of their output) is used in affiliated blast furnaces.

The Bureau of Mines does not collect data on manufacturing costs of coke and coal chemicals. The values and prices of coal, coke, and other products shown in this chapter were obtained from annual reports submitted to the Bureau of Mines by producing companies. For commercial sales of coke, gas, and coal chemicals, the dollar values are the amounts received for the products f. o. b. ovens. The values for coke, breeze, crude tar, pitch, and surplus gas used as fuel are the market values of these products assigned by the producing companies.

The term "coke," as used in this chapter, refers only to the large sizes (usually one-half inch plus) from which the smaller sizes (known as breeze) have been screened. Metallurgical coke refers to the grades used for smelting and casting ferrous metals in blast furnaces and foundries. The standard unit of measurement in the coke industry is the net or short ton of 2,000 pounds, which is employed throughout this chapter.

OVEN AND BEEHIVE COKE AND BREEZE

MONTHLY PRODUCTION

TABLE 4.—Coke produced in the United States and average per day, 1947–49 (average) and 1954–56, by months, in net tons [1]

Month	1947–49 (average)		1954		1955		1956	
	Total	Daily average	Total	Daily average	Total	Daily average	Total	Daily average
Oven coke:								
January	5,875,300	189,500	5,643,100	182,000	5,757,300	185,700	6,665,300	215,000
February	5,393,400	192,600	4,831,300	172,500	5,338,200	190,700	6,238,700	215,100
March	5,775,800	186,300	5,117,500	165,100	6,143,300	198,200	6,629,600	213,900
April	5,231,600	174,400	4,667,600	155,600	6,025,900	200,900	6,384,200	212,800
May	5,707,400	184,100	4,782,100	154,300	6,299,500	203,200	6,471,300	208,700
June	5,409,700	180,300	4,618,000	153,900	6,008,500	200,300	6,023,900	200,800
July	5,355,900	172,800	4,600,600	148,400	6,048,600	195,100	2,258,500	72,900
August	5,564,400	179,500	4,485,800	144,700	6,240,600	201,300	5,504,700	177,600
September	5,394,700	179,800	4,464,900	148,800	6,245,100	208,200	6,303,000	210,100
October	4,519,000	145,800	5,063,400	163,300	6,462,200	208,500	6,561,100	211,600
November	5,003,500	166,800	5,207,200	173,600	6,364,100	212,100	6,332,300	211,100
December	5,857,800	189,000	5,579,900	180,000	6,650,900	214,500	6,619,600	213,500
Total	65,088,500	178,300	59,061,400	161,800	73,584,200	201,600	71,992,200	196,700
Beehive coke:								
January	623,500	20,100	164,900	5,400	61,800	2,000	263,700	8,500
February	574,900	20,600	63,200	2,300	65,000	2,300	251,200	8,700
March	461,900	14,900	35,600	1,100	106,200	3,400	276,100	8,900
April	445,000	14,800	36,800	1,200	122,700	4,100	254,000	8,500
May	582,300	18,800	32,800	1,000	138,200	4,500	263,000	8,500
June	432,500	14,400	34,500	1,200	153,500	5,100	217,500	7,200
July	304,500	9,800	33,700	1,100	143,600	4,600	52,900	1,700
August	425,000	13,700	44,000	1,400	164,300	5,300	115,400	3,700
September	413,500	13,800	40,200	1,400	162,000	5,400	151,600	5,100
October	428,800	13,800	32,500	1,100	178,300	5,700	184,800	6,000
November	411,700	13,700	39,700	1,300	190,600	6,400	206,400	6,900
December	456,300	14,700	43,200	1,400	231,400	7,500	225,400	7,300
Total	5,559,900	15,300	601,100	1,700	1,717,600	4,700	2,462,000	6,700
Total:								
January	6,498,800	209,600	5,808,000	187,400	5,819,100	187,700	6,929,000	223,500
February	5,968,300	213,200	4,894,500	174,800	5,403,200	193,000	6,489,900	223,800
March	6,237,700	201,200	5,153,100	166,200	6,249,500	201,600	6,905,700	222,800
April	5,676,600	189,200	4,704,400	156,800	6,148,600	205,000	6,638,200	221,300
May	6,289,700	202,900	4,814,900	155,300	6,437,700	207,700	6,734,300	217,200
June	5,842,200	194,700	4,652,500	155,100	6,162,000	205,400	6,241,400	208,000
July	5,660,400	182,600	4,634,300	149,500	6,192,200	199,700	2,311,400	74,600
August	5,989,400	193,200	4,529,800	146,100	6,404,900	206,600	5,620,100	181,300
September	5,808,200	193,600	4,505,100	150,200	6,407,100	213,600	6,454,600	215,200
October	4,947,800	159,600	5,095,900	164,400	6,640,500	214,200	6,745,900	217,600
November	5,415,200	180,500	5,246,900	174,900	6,554,700	218,500	6,538,700	218,000
December	6,314,100	203,700	5,623,100	181,400	6,882,300	222,000	6,845,000	220,800
Grand total	70,648,400	193,600	59,662,500	163,500	75,301,800	206,300	74,454,200	203,400

[1] Daily average calculated by dividing monthly production by number of days in month.

PRODUCTION BY FURNACE AND MERCHANT PLANTS

Production of oven coke at furnace plants in 1956 decreased 3 percent from 1955; output from nonfurnace or merchant operations increased 5 percent. Output at furnace plants declined because of the 35-day work stoppage beginning July 1 in the iron and steel industry. This stoppage resulted in a reduction of 4 million tons of coke in July; furnace plants produced only 1½ million tons compared with an average monthly output of 5½ million for the first 6 months. Although nonfurnace or merchant plants were affected by the curtailment in blast-furnace-coke demand during the strike, demand for other uses was good, and output in July declined only 153,000 tons (18 percent) from the average of the first 6 months. As a result of the drastic drop in coke production at furnace plants in July, nonfurnace or merchant plants produced 13 percent of the total oven-coke output compared with 12 percent in 1955.

Table 5 shows the change since 1947–49 in oven-coke production at furnace and merchant plants. Oven-coke production supplied by furnace plants increased markedly; output at nonfurnace or merchant plants declined. Apparently this trend will continue in future, as expansion in carbonizing capacity planned at furnace oven-coke plants should increase the furnace group's share of output.

TABLE 5.—Monthly and average daily production of oven coke in the United States, 1947–49 (average) and 1955–56, by types of plant, in net tons

Month	1947–49 (average)		1955		1956	
	Furnace plants	Merchant plants	Furnace plants	Merchant plants	Furnace plants	Merchant plants
Monthly production:						
January	4,700,600	1,174,700	5,050,000	707,300	5,793,900	871,400
February	4,323,300	1,070,100	4,695,100	643,100	5,423,400	815,300
March	4,618,000	1,157,800	5,411,900	731,400	5,772,100	857,500
April	4,188,600	1,043,000	5,306,900	719,000	5,568,500	815,700
May	4,578,100	1,129,300	5,552,200	747,300	5,611,200	860,100
June	4,329,000	1,080,700	5,288,500	720,000	5,250,800	773,100
July	4,273,800	1,082,100	5,314,700	733,900	1,579,000	679,500
August	4,466,700	1,097,700	5,472,600	768,000	4,759,200	745,500
September	4,321,900	1,072,800	5,454,900	790,200	5,539,900	763,100
October	3,471,600	1,047,400	5,620,000	842,200	5,754,100	807,000
November	3,977,500	1,026,000	5,534,500	829,600	5,552,100	780,200
December	4,725,000	1,132,800	5,788,400	862,500	5,812,800	806,800
Total	51,974,100	13,114,400	64,489,700	9,094,500	62,417,000	9,575,200
Average daily production:						
January	151,600	37,900	162,900	22,800	186,900	28,100
February	154,400	38,200	167,700	23,000	187,000	28,100
March	149,000	37,300	174,600	23,600	186,200	27,700
April	139,600	34,800	176,900	24,000	185,600	27,200
May	147,700	36,400	179,100	24,100	181,000	27,700
June	144,300	36,000	176,300	24,000	175,000	25,800
July	137,900	34,900	171,400	23,700	51,000	21,900
August	144,100	35,400	176,500	24,800	153,500	24,100
September	144,100	35,700	181,800	26,400	184,700	25,400
October	112,000	33,800	181,300	27,200	185,600	26,000
November	132,600	34,200	184,500	27,600	185,100	26,000
December	152,400	36,600	186,700	27,800	187,500	26,000
Average for year	142,400	35,900	176,700	24,900	170,500	26,200

TABLE 6.—Number and production of oven-coke plants in the United States, 1929, 1939, 1947–49 (average), and 1952–56, by types of plant

Year	Number of active plants [1]		Coke produced (net tons)		Percent of production	
	Furnace plants	Merchant plants	Furnace plants	Merchant plants	Furnace plants	Merchant plants
1929	46	41	41,224,387	12,187,439	77.2	22.8
1939	45	39	31,811,807	11,070,506	74.2	25.8
1947–49 (average)	[2] 55	[2] 31	51,974,089	13,114,373	79.9	20.1
1952	57	27	52,128,906	11,721,209	81.6	18.4
1953	58	25	62,628,176	10,965,352	85.1	14.9
1954	58	24	51,698,475	7,362,967	87.5	12.5
1955	58	23	64,489,687	9,094,527	87.6	12.4
1956	57	23	62,417,048	9,575,194	86.7	13.3

[1] Includes plants operating any part of year.
[2] On Dec. 31, 1949.

PRODUCTION BY STATES AND DISTRICTS

The output of coke comes from States producing coking coal as well as those that are the major producers and consumers of iron and steel products. Consequently, the number of coke-producing States seldom changes; however, the magnitude of production varies. In 1956, coke was produced in 22 States, the same number as in the preceding 2 years. Oven coke was made in 21 States and beehive in 5. Both oven and beehive coke were produced in Kentucky, Pennsylvania, Utah, and West Virginia. Pennsylvania led the States in coke production, supplying 27 percent of the oven-coke output and 81 percent of the beehive. The States did not change in rank of production; Ohio, Indiana, and Alabama followed Pennsylvania. These States together supplied 37 percent of the entire production of oven coke.

Production in 1956 did not change significantly from 1955, except when compared with 1947–49. For example, production in California was more than 3 times greater than in 1947–49 because of the recent expansion in carbonizing capacity by the Kaiser Steel Corp. at Fontana. Production was 48 percent higher in Maryland, 38 percent in Texas, 35 percent in West Virginia, 30 percent in Michigan, and 20 percent each in Minnesota, Ohio, and Pennsylvania. Significant decreases occurred in Illinois, Massachusetts, and New York. Closing of merchant plants in these States has not been compensated by increases in production at furnace plants and has resulted in a sharp decline in coke output.

Production of oven coke in 1956 by steel-producing districts established by the iron and steel industry is shown in table 8. This grouping is important in ascertaining trends in coke production because of its close relationship to steel production. The fastest-growing area in coke production in the past decade was the Western district, which increased output by 139 percent. The largest increase in quantity, however, was in the Pittsburgh-Youngstown district. In 1944 this district produced only 27 percent of the total oven-coke output. Expansions in pig-iron productive capacity since that time have increased coke requirements, which in turn have caused capacity to rise. Consequently, coke output in this district in 1956 amounted to 34 percent of the national total. Although blast-furnace-coke requirements in the Eastern district have increased, losses in the residential and water-gas-coke markets have caused all but one of the coke plants operated by gas utilities to retire their coke ovens, resulting in a decline in production in this district. Output in the Chicago district has also declined; output in the Cleveland-Detroit district and the Southern district has increased slightly.

TABLE 7.—Coke produced in the United States, 1947–49 (average) and 1953–56, by States, in net tons

State	1947–49 (average)	1953	1954	1955	1956
Oven coke:					
Alabama	5, 682, 198	6, 278, 239	5, 301, 550	6, 245, 253	5, 763, 749
California	325, 182	749, 381	627, 577	814, 687	1, 032, 375
Colorado	851, 906	967, 074	662, 282	788, 558	748, 440
Illinois	3, 558, 768	3, 513, 142	2, 248, 206	3, 040, 900	2, 802, 223
Indiana	8, 301, 067	8, 886, 502	8, 200, 262	9, 482, 233	8, 920, 369
Maryland	2, 054, 315	3, 268, 655	3, 078, 371	3, 235, 527	3, 050, 420
Massachusetts	1, 048, 037	849, 535	516, 344	550, 868	608, 052
Michigan	2, 717, 650	3, 220, 133	2, 308, 924	3, 421, 141	3, 531, 031
Minnesota	841, 976	862, 151	803, 860	1, 029, 228	1, 012, 564
New Jersey	1, 396, 082	1, 175, 416	929, 768	992, 566	1, 223, 050
New York	5, 507, 449	4, 589, 609	3, 578, 703	4, 035, 076	3, 825, 368
Ohio	9, 847, 621	11, 717, 556	8, 228, 873	11, 701, 266	11, 799, 045
Pennsylvania	15, 964, 464	18, 747, 300	15, 566, 002	19, 488, 993	19, 098, 406
Tennessee	235, 577	231, 330	154, 194	208, 789	206, 196
Texas	468, 083	751, 926	699, 536	742, 781	645, 830
Utah	978, 701	1, 407, 818	997, 749	1, 334, 760	1, 334, 976
West Virginia	3, 101, 109	4, 203, 360	3, 708, 905	4, 324, 863	4, 197, 403
Connecticut, Kentucky, Missouri, Rhode Island, and Wisconsin	2, 208, 277	2, 174, 401	[1] 1, 450, 336	[1] 2, 146, 725	[1] 2, 192, 745
Total	65, 088, 462	73, 593, 528	59, 061, 442	73, 584, 214	71, 992, 242
Beehive coke:					
Colorado	7, 163				
Kentucky	81, 871	62, 500		37, 780	73, 269
Pennsylvania	4, 848, 550	4, 635, 513	432, 061	1, 313, 694	2, 005, 590
Utah	129, 680	83, 863	58, 558	111, 476	112, 755
Virginia	190, 200	188, 033	72, 092	140, 555	165, 968
West Virginia	302, 476	273, 420	38, 343	114, 107	104, 440
Total	5, 559, 940	5, 243, 329	601, 054	1, 717, 612	2, 462, 022
Grand total	70, 648, 402	78, 836, 857	59, 662, 496	75, 301, 826	74, 454, 264

[1] Excludes Rhode Island.

TABLE 8.—Oven coke produced in the United States in 1956, by steel-producing districts [1]

District	In existence Dec. 31		Coal carbonized (net tons)	Yield of coke from coal (percent)	Coke produced (net tons)	Value of coke at ovens	
	Plants	Ovens				Total	Per ton
Eastern	16	3, 461	21, 955, 730	72. 02	15, 811, 783	$249, 066, 094	$15. 75
Pittsburgh-Youngstown	22	4, 869	35, 589, 604	68. 04	24, 215, 306	397, 419, 031	16. 41
Cleveland-Detroit	10	1, 876	12, 128, 006	72. 42	8, 782, 590	155, 422, 626	17. 70
Chicago	17	3, 320	18, 643, 044	72. 15	13, 450, 997	274, 780, 322	20. 43
Southern	10	1, 608	9, 011, 843	73. 41	6, 615, 775	127, 085, 051	19. 21
Western	4	789	4, 920, 506	63. 32	3, 115, 791	70, 440, 656	22. 61
Total	79	15, 923	102, 248, 733	70. 41	71, 992, 242	1, 274, 213, 780	17. 70

[1] As defined by American Iron and Steel Institute.

TABLE 9.—Coke breeze recovered at coke plants in the United States in 1956, by States

State	Yield per ton of coal [1] (percent)	Produced		Sold	
		Net tons	Value	Net tons	Value
Oven coke:					
Alabama	4. 52	356, 402	$3, 466, 676	206, 261	$1, 681, 919
California	4. 76	80, 337	(2)	12, 431	(2)
Colorado	5. 90	66, 704	(2)	9	(2)
Illinois	4. 76	187, 629	889, 285	85, 584	458, 605
Indiana	5. 07	626, 262	3, 231, 323	132, 176	695, 597
Maryland	4. 20	176, 523	(2)	35	(2)
Massachusetts	6. 49	55, 294	(2)		
Michigan	5. 18	245, 896	1, 447, 175	62, 330	390, 354
Minnesota	3. 80	53, 300	234, 422	11, 380	(2)
New Jersey	6. 26	101, 605	(2)	371	(2)
New York	4. 35	235, 975	1, 297, 735	1, 183	(2)
Ohio	4. 88	819, 222	4, 157, 787	297, 821	1, 679, 909
Pennsylvania	4. 11	1, 146, 903	4, 760, 430	115, 772	547, 022
Tennessee	2. 45	6, 334	(2)	26	(2)
Texas	4. 82	42, 160	(2)	15, 371	(2)
Utah	6. 96	146, 328	(2)	68, 866	(2)
West Virginia	4. 24	254, 387	1, 047, 892	46, 677	192, 137
Connecticut, Kentucky, Missouri, and Wisconsin	5. 56	170, 552	1, 368, 348	67, 365	577, 844
Undistributed			4, 306, 323		1, 007, 985
Total 1956	4. 67	4, 771, 813	26, 207, 396	1, 123, 658	7, 231, 372
At merchant plants	4. 89	643, 827	4, 628, 789	205, 357	1, 718, 243
At furnace plants	4. 63	4, 127, 986	21, 578, 607	918, 301	5, 513, 129
Total 1955	4. 66	4, 862, 225	24, 849, 962	1, 170, 507	6, 661, 075
Beehive coke:					
Pennsylvania	2. 98	55, 213	130, 487	37, 043	75, 977
Utah	4. 03	8, 989	(2)	8, 989	(2)
Virginia	9. 08	22, 898	(2)	22, 941	(2)
West Virginia	2. 53	4, 308	6, 798	4, 308	6, 798
Undistributed			96, 737		96, 838
Total 1956	3. 66	91, 408	234, 022	73, 281	179, 613
Total 1955	5. 54	88, 795	309, 329	89, 048	309, 899

See footnotes at end of table.

TABLE 9.—Coke breeze recovered at coke plants in the United States in 1956, by States—Continued

State	Used by producers—				Wasted (net tons)	On hand Dec. 31 (net tons)
	For steam raising		For other purposes [3]			
	Net tons	Value	Net tons	Value		
Oven coke:						
Alabama	105,553	$1,354,081	47,624	$511,152		34,367
California			67,906	(2)		
Colorado			66,733	(2)		2,289
Illinois	93,495	396,063	23,396	119,616		39,316
Indiana	253,721	1,296,070	106,627	558,201		336,163
Maryland	171,040	(2)	22,691	(2)		15,186
Massachusetts	55,294	(2)				
Michigan	103,439	589,199	79,784	468,489		13,031
Minnesota	24,787	(2)	12,872	(2)		11,415
New Jersey	96,025	(2)				22,749
New York	179,069	997,506	47,761	(2)		90,954
Ohio	264,033	1,279,463	234,356	1,109,990	4,500	121,243
Pennsylvania	873,297	3,488,470	99,460	449,081		176,934
Tennessee	3,134	(2)				5,624
Texas			26,912	(2)		908
Utah			69,806	(2)		29,142
West Virginia	88,022	(2)	111,137	(2)		29,862
Connecticut, Kentucky, Missouri, and Wisconsin	112,238	846,926				11,719
Undistributed		2,293,803		2,251,549		
Total 1956	2,423,147	12,541,581	1,017,065	5,468,078	4,500	[4] 940,902
At merchant plants	442,131	2,942,290	12,978	65,084		74,610
At furnace plants	1,981,016	9,599,291	1,004,087	5,402,994	4,500	866,292
Total 1955	2,581,803	12,626,112	1,032,463	5,168,710		[4] 759,103
Beehive coke:						
Pennsylvania			18,170	(2)		
Utah						
Virginia						144
West Virginia						
Undistributed				(5)		
Total 1956			18,170	(5)		144
Total 1955						187

[1] Computed by dividing production of breeze by coal carbonized at plants actually recovering breeze.
[2] Included with "Undistributed" to avoid disclosing individual company figures.
[3] Includes 575,605 net tons valued at $3,218,983 used for sintering iron ore.
[4] Includes some breeze resulting from the screening of coke at blast furnaces.
[5] Not published to avoid disclosing individual company figures.

NUMBER AND TYPE OF OVENS

Slot-Type Coke Ovens.—For the 4th time in 10 years the oven-coke industry finished the year with fewer ovens than at the beginning. After reaching a peak of 16,039 on December 31, 1955, the number of ovens was reduced by 116, as the industry was able to complete only 302 new ovens in 1956; 418 were taken out of production mostly for rebuilding or replacement with new ovens of equivalent or greater capacity. In several instances batteries of ovens were permanently retired and will not be replaced or rebuilt.

Table 11 shows the age of ovens at merchant and furnace plants. As coke ovens are not permanent structures and serviceable life is limited by a number of variable factors (kind and quality of refractory material used in their construction, operating conditions, and kind of coal carbonized), the average age of ovens in existence is important. At the end of 1956 over one-third of the active ovens were more than

25 years old. Although it is not intended to imply that 25 years is the serviceable life of a coke oven, past experience shows that, with few exceptions, after that time ovens become increasingly difficult to maintain economically. Therefore, to maintain in future years the number of ovens in existence at the end of 1956, a minimum of 300 ovens per year would have to be rebuilt or replaced. To increase

TABLE 10.—Slot-type coke ovens completed and abandoned in the United States in 1956 and number in existence at end of year, by States

State	Plants in existence Dec. 31	Ovens						
		In existence Dec. 31		New		Abandoned during year [1]	Under construction Dec. 31	
		Number	Annual coke capacity (net tons)	Number	Annual coke capacity (net tons)		Number	Annual coke capacity (net tons)
Alabama	7	1,424	6,830,900	30	164,000		73	379,900
California	1	225	1,055,000					
Colorado	1	256	1,220,000			1		
Connecticut	1	70	410,000					
Illinois	7	625	2,866,100	50	279,000	136	102	579,000
Indiana	5	2,165	10,261,900	162	891,200			
Kentucky	1	196	1,185,200					
Maryland	1	687	3,764,000					
Massachusetts	1	108	665,000					
Michigan	4	691	3,777,300				78	500,000
Minnesota	3	241	1,054,100					
Missouri	1	89	307,000			7		
New Jersey	2	341	1,500,000					
New York	3	831	4,583,100			31		
Ohio	16	2,493	12,494,200			51	186	985,500
Pennsylvania	14	3,976	20,367,400	19	144,000	192	192	864,900
Tennessee	1	44	264,000					
Texas	2	140	798,000					
Utah	2	308	1,345,700					
West Virginia	5	813	4,646,100	41	280,000			
Wisconsin	1	200	570,100					
Total 1956	79	15,923	79,965,100	302	1,758,200	418	631	3,309,300
At merchant plants	22	2,424	11,009,600			58		
At furnace plants	57	13,499	68,955,500	302	1,758,200	360	631	3,309,300
Total 1955	81	16,039	79,675,500	565	2,823,600	417	261	1,492,000

[1] Includes ovens dismantled for rebuilding.

TABLE 11.—Age of slot-type coke ovens in the United States on Dec. 31, 1956 [1]

Age	Merchant plants		Furnace plants		Total			
	Number of ovens	Annual coke capacity (net tons)	Number of ovens	Annual coke capacity (net tons)	Number of ovens	Percent of total	Annual coke capacity (net tons)	Percent of total
Under 5 years	125	701,300	2,532	13,400,200	2,657	16.7	14,101,500	17.6
From 5 to 10 years	234	1,185,200	2,958	16,274,300	3,192	20.1	17,459,500	21.8
From 10 to 15 years	157	704,400	2,341	12,786,300	2,498	15.7	13,490,700	16.9
From 15 to 20 years	262	1,538,200	1,316	7,237,500	1,578	9.9	8,775,700	11.0
From 20 to 25 years	85	346,500	597	3,064,400	682	4.3	3,410,900	4.3
From 25 to 30 years	252	1,278,500	582	3,245,300	834	5.2	4,523,800	5.7
From 30 to 35 years	266	1,347,100	434	1,949,200	700	4.4	3,296,300	4.1
From 35 to 40 years	360	1,243,300	1,663	6,739,400	2,023	12.7	7,982,700	10.0
40 years and over	683	2,665,100	1,076	4,258,900	1,759	11.0	6,924,000	8.6
Total	2,424	11,009,600	13,499	68,955,500	15,923	100.0	79,965,100	100.0

[1] Age dates from first entry into operation or from last date of rebuilding.

capacity, however, this number would have to be raised proportionately. Coke producers were actively engaged not only in maintaining existing capacity but in increasing it substantially, and 631 ovens were reported under construction at the end of 1956. In addition, several steel companies had signed contracts for constructing new batteries, but actual work had not begun by the end of the year, and these were not reported to the Bureau of Mines.

Beehive Ovens.—In 1956, for the fifth consecutive year, the number of beehive ovens reported to the Bureau of Mines declined. The total number reported in existence at the end of 1956 was 555 less than at the end of 1955 and 10,909 less than at the end of 1951. Most of these beehive ovens were idle for several years and had been removed from the Bureau's listing because they had been reported as abandoned. They could, however, be rehabilitated in a short time if a need for coke arose and coking coal were available. Unlike slot-type ovens, which cannot be operated intermittently without damage to oven walls, beehive ovens can be taken out of production and easily started again with minimum damage. Therefore, the number of beehive ovens in operation fluctuates with demand for metallurgical coke.

TABLE 12.—Beehive-coke ovens reconstructed and abandoned in the United States in 1956 and number in existence at end of year, by States

State	Plants in existence Dec. 31	Ovens: In existence Dec. 31		In operating condition Dec. 31		Not in operating condition Dec. 31		Rebuilt or repaired	Abandoned or dismantled during year	In course of reconstruction Dec. 31
		Number	Annual coke capacity (net tons)	Number	Annual coke capacity (net tons)	Number	Annual coke capacity (net tons)			
Kentucky	1	193	120,000	193	120,000				2	
Pennsylvania	50	7,873	4,974,700	6,146	3,945,400	1,727	1,029,300	180	733	18
Utah	1	297	120,000	292	118,000	5	2,000			
Virginia	4	483	237,000	423	206,800	60	30,200			
West Virginia	5	703	314,000	402	161,400	301	152,600			
Total 1956	61	9,549	5,765,700	7,456	4,551,600	2,093	1,214,100	180	[1] 735	18
Total 1955	66	10,104	6,285,300	8,790	5,516,700	1,314	768,600	553	[1] 2,665	31

[1] Idle and not expected to resume production; removed from list of available ovens.

TABLE 13.—Average number of beehive-coke ovens active in the United States in 1956, by months

Month	Number	Month	Number	Month	Number
January	5,548	May	5,546	September	4,205
February	5,520	June	5,092	October	4,373
March	5,630	July	3,488	November	4,730
April	5,790	August	4,172	December	5,032

CAPACITY OF OVEN-COKE PLANTS

The potential annual coke capacity of oven-coke plants in the United States increased slightly during 1956 and was only 35,000 tons short of reaching 80 million tons. Carbonizing capacity of merchant oven-coke plants continued to decline, principally because of the permanent retirement of a battery owned by The Peoples Gas Light and Coke Co. at Chicago, Ill. Although 1 less furnace oven-coke plant and 58 fewer ovens were in existence at the end of 1956 than in 1955, the annual coke capacity increased 1 percent because most of the new ovens installed were of larger capacity than the old ones taken out of production. Oven-coke plants, particularly those connected with iron and steel plants, are usually huge establishments. Annual coke capacity of furnace oven-coke plants averaged 1,200,000 tons; capacity of merchant plants averaged 500,000. High initial construction costs of slot-type coke ovens (including coal- and coke-handling facilities and coal-chemical-recovery equipment) make large plants almost imperative.

The potential annual coke capacity reported to the Bureau of Mines by the companies is based on the minimum coking time necessary to produce a coke with qualities suitable for its intended use. The potential capacity of a plant may change from year to year, depending on the age and condition of ovens, the character and quality of coal carbonized, the grade of coke required, and other economic factors.

Table 15 shows the percentage of capacity used each month during

TABLE 14.—Potential maximum annual coke capacity of all oven-coke plants in existence in the United States, 1949 and 1952–56

Year	Merchant plants				Furnace plants				Total			
	In existence Dec. 31		Potential maximum annual coke capacity (net tons)	Change from 1949 (percent)	In existence Dec. 31		Potential maximum annual coke capacity (net tons)	Change from 1949 (percent)	In existence Dec. 31		Potential maximum annual coke capacity (net tons)	Change from 1949 (percent)
	Plants	Ovens			Plants	Ovens			Plants	Ovens		
1949	30	3,057	14,209,200	------	55	12,047	59,500,900	------	85	15,104	73,710,100	------
1952	25	2,781	12,779,700	−10.1	57	12,827	63,648,300	+7.0	82	15,608	76,428,000	+3.7
1953	24	2,693	12,090,900	−14.9	58	13,296	66,167,100	+11.2	82	15,989	78,258,000	+6.2
1954	23	2,458	10,686,300	−24.8	58	13,433	67,909,300	+14.1	81	15,891	78,595,600	+6.6
1955	23	2,482	11,220,200	−21.0	58	13,557	68,455,300	+15.0	81	16,039	79,675,500	+8.1
1956	22	2,424	11,009,600	−22.5	57	13,499	68,955,500	+15.9	79	15,923	79,965,100	+8.5

TABLE 15.—Relationship of production to potential maximum capacity [1] at oven-coke plants in the United States, 1952–56, by months, in percent

Month	1952	1953	1954	1955	1956	Month	1952	1953	1954	1955	1956
January	97.7	96.8	82.6	85.6	97.5	August	90.2	93.5	67.9	93.3	81.2
February	97.7	96.4	78.4	87.9	97.5	September	92.9	92.5	69.8	96.5	96.2
March	97.7	95.8	75.0	91.4	97.0	October	94.3	91.8	76.6	96.7	96.9
April	86.5	93.9	70.6	92.6	96.5	November	95.0	89.6	81.4	98.4	96.6
May	86.1	93.8	70.0	93.7	94.7	December	95.7	85.0	84.4	99.5	97.8
June	38.1	94.3	70.4	92.9	91.9						
July	36.1	93.9	69.6	90.5	33.3	Year	84.0	93.1	74.7	93.3	89.7

[1] Capacity of all ovens in existence, whether active or idle, based upon maximum daily capacity multiplied by days in month.

1956 and similar data for the 4 preceding years. The rate of oven-coke production dropped 3.6 points in 1956 but was considerably higher than in 1954. The low point for the year occurred in July, when the average rate for the industry dropped to 33 percent of capacity. This average rate rose to 81 percent in August and 98 percent in December—the highest figure for the entire year.

QUANTITY AND VALUE OF COAL CARBONIZED

Coke ovens (second to electric-power utilities among the major coal-consuming industries) carbonized about one-fifth of the total bituminous-coal production in 1956. The coke industry used more than 100 million tons of coal for the first time in 1942 and in the 14 subsequent years exceeded the 100-million figure 9 times. The maximum quantity of coal was carbonized in coke ovens in 1951 when more than 113.7 million tons (including anthracite) was used. Industrial activity in 1954 declined sharply and reduced the demand for coke; the quantity of coal carbonized necessarily dropped to the lowest point in a decade. Industrial activity surged in 1955, causing use of coal at coke ovens to increase steadily and reached a peak in December. A record tonnage, totaling more than 57 million tons (including anthracite), was carbonized during the first 6 months of 1956. In the last 6 months, because of the steel strike in July and the first week of August, consumption was much lower, totaling only 49 million tons. In spite of the drastic curtailment in the use of coal during July, the total for the year was only 1 percent less than in 1955 but was 5 percent above 1947–49.

The quantity of coal carbonized declined, but the value at ovens increased 4 percent and totaled $980,104,829. The average value per ton at oven-coke plants increased $0.51, a gain of 6 percent over 1955. Coal costs or value per ton increased in all States except Minnesota, where coal costs decreased $0.33 per ton or 3 percent. Coal costs increased owing to higher mining costs.

The average value per ton of coal at beehive plants increased $0.40 (7 percent) over 1955 but was $0.45 (7 percent) below the maximum reached in 1954. Coal costs increased in Kentucky, Pennsylvania, Virginia, and West Virginia. In Utah costs decreased substantially.

TABLE 16.—Bituminous coal carbonized in coke ovens in the United States, 1947–49 (average) and 1955–56, by months, in net tons

Month	1947–49 (average)			1955			1956		
	Slot type	Beehive	Total	Slot type	Beehive	Total	Slot type	Beehive	Total
Jan	8, 320, 100	987, 400	9, 307, 500	8, 252, 100	101, 800	8, 353, 900	9, 450, 500	424, 700	9, 875, 200
Feb	7, 647, 600	906, 500	8, 554, 100	7, 625, 200	107, 800	7, 733, 000	8, 821, 300	413, 800	9, 235, 100
Mar	8, 195, 000	726, 000	8, 921, 000	8, 748. 900	176, 100	8, 925, 000	9, 424, 600	456, 700	9, 881, 300
Apr	7, 448, 200	700, 900	8, 149, 100	8, 518, 800	207, 400	8, 726, 200	9, 066, 500	415, 000	9, 481, 500
May	8, 096, 100	905, 800	9, 001, 900	8, 922, 200	228, 500	9, 150, 700	9, 168, 000	432, 900	9, 600, 900
June	7, 697, 200	673, 900	8, 371, 100	8, 515, 300	256, 600	8, 771, 900	8, 485, 600	358, 900	8, 844, 500
July	7, 631, 400	482, 200	8, 113, 600	8, 612, 700	238, 000	8, 850, 700	3, 125, 500	102, 100	3, 227, 600
Aug	7, 901, 400	665, 500	8, 566, 900	8, 878, 800	272, 900	9, 151, 700	7, 784, 800	185, 700	7, 970, 500
Sept	7, 617, 700	645, 000	8, 262, 700	8, 849, 100	269, 000	9, 118, 100	8, 915, 200	246, 300	9, 161, 500
Oct	6, 397, 800	669, 100	7, 066, 900	9, 147, 000	300, 400	9, 447, 400	9, 266, 700	301, 000	9, 567, 700
Nov	7, 118, 300	641, 900	7, 760, 200	9, 013, 600	320, 000	9, 333, 600	8, 980, 000	339, 400	9, 319, 400
Dec	8, 326, 100	712, 700	9, 038, 800	9, 424, 000	390, 700	9, 814, 700	9, 382, 700	366, 900	9, 749, 600
Total	92,396,900	8, 716, 900	101, 113, 800	104, 507, 700	2, 869, 200	107, 376, 900	101, 871, 400	4, 043, 400	105, 914, 800

TABLE 17.—Anthracite carbonized at oven-coke plants in the United States, 1947–49 (average) and 1953–56, by months, in net tons

Month	1947–49 (average)	1953	1954	1955	1956
January	17, 600	18, 900	24, 900	20, 000	33, 400
February	16, 600	17, 500	21, 600	21, 300	32, 300
March	19, 300	21, 500	20, 900	28, 900	36, 500
April	21, 500	22, 800	19, 400	31, 700	33, 100
May	18, 800	26, 300	18, 800	33, 700	33, 600
June	19, 800	24, 300	16, 700	31, 200	29, 700
July	18, 200	24, 500	15, 600	27, 600	24, 900
August	18, 900	24, 500	17, 300	29, 100	31, 700
September	20, 100	20, 800	16, 600	36, 700	30, 400
October	22, 000	22, 900	19, 100	38, 700	30, 700
November	20, 900	23, 700	18, 700	32, 900	30, 400
December	16, 700	26, 900	19, 800	34, 400	30, 600
Total	230, 400	274, 600	229, 400	366, 200	377, 300

TABLE 18.—Quantity and value at ovens of coal carbonized in the United States in 1956, by States

State	Coal carbonized (net tons)	Value of coal		Coal per ton of coke	
		Total	Per ton	Net tons	Value
Oven coke:					
Alabama	7, 879, 210	$60, 541, 806	$7. 68	1. 37	$10. 50
California	1, 688, 287	(1)	(1)	1. 64	(1)
Colorado	1, 131, 129	(1)	(1)	1. 51	(1)
Illinois	3, 938, 156	41, 108, 779	10. 44	1. 41	14. 67
Indiana	12, 361, 784	130, 843, 085	10. 58	1. 39	14. 67
Maryland	4, 198, 946	(1)	(1)	1. 38	(1)
Massachusetts	852, 409	(1)	(1)	1. 40	(1)
Michigan	4, 745, 766	46, 318, 301	9. 76	1. 34	13. 12
Minnesota	1, 401, 792	14, 247, 474	10. 16	1. 38	14. 07
New Jersey	1, 624, 316	(1)	(1)	1. 33	(1)
New York	5, 430, 386	57, 568, 584	10. 60	1. 42	15. 05
Ohio	16, 773, 169	156, 876, 280	9. 35	1. 42	13. 30
Pennsylvania	27, 929, 111	233, 600, 103	8. 36	1. 46	12. 23
Tennessee	258, 460	(1)	(1)	1. 25	(1)
Texas	874, 173	(1)	(1)	1. 35	(1)
Utah	2, 101, 090	(1)	(1)	1. 57	(1)
West Virginia	5, 993, 141	41, 772, 665	6. 97	1. 43	9. 95
Connecticut, Kentucky, Missouri, and Wisconsin	3, 067, 408	30, 035, 787	9. 79	1. 40	13. 70
Undistributed		142, 965, 942	11. 23		16. 16
Total 1956	102, 248, 733	955, 878, 806	9. 35	1. 42	13. 28
At merchant plants	13, 179, 615	129, 621, 311	9. 83	1. 38	13. 54
At furnace plants	89, 069, 118	826, 257, 495	9. 28	1. 43	13. 24
Total 1955	104, 873, 873	927, 372, 709	8. 84	1. 43	12. 60
Beehive coke:					
Kentucky	128, 580	(1)	(1)	1. 75	(1)
Pennsylvania	3, 202, 726	19, 715, 267	6. 16	1. 60	9. 83
Utah	222, 844	(1)	(1)	1. 98	(1)
Virginia	319, 110	1, 614, 826	5. 06	1. 92	9. 73
West Virginia	170, 123	1, 094, 506	6. 43	1. 63	10. 48
Undistributed		1, 801, 424	5. 13		9. 68
Total 1956	4, 043, 383	24, 226, 023	5. 99	1. 64	9. 84
Total 1955	2, 869, 212	16, 048, 701	5. 59	1. 67	9. 34

[1] Included with "Undistributed" to avoid disclosing individual company figures.

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TABLE 19.—Average value per net ton of coal carbonized at oven-coke plants in the United States, 1947–49 (average) and 1953–56, by States

State	1947–49 (average)	1953	1954	1955	1956
Alabama	$6.27	$6.93	$6.69	$7.48	$7.68
Illinois	9.00	10.62	10.03	9.73	10.44
Indiana	8.99	10.54	10.50	10.44	10.58
Michigan	7.98	9.71	9.03	8.71	9.76
Minnesota	9.40	10.76	10.33	10.49	10.16
New York	9.00	10.63	10.49	9.84	10.60
Ohio	7.75	9.21	8.85	8.58	9.35
Pennsylvania	6.88	8.11	8.05	7.84	8.36
West Virginia	5.79	7.28	6.96	6.80	6.97
Other States [1]	8.58	10.89	[2] 10.59	[2] 10.44	[2] 10.95
United States average	7.79	9.24	9.00	8.84	9.35
Value of coal per ton of coke	11.09	13.17	12.89	12.60	13.28

[1] California, Colorado, Connecticut, Kentucky, Maryland, Massachusetts, Missouri, New Jersey, Rhode Island, Tennessee, Texas, Utah, and Wisconsin.
[2] Excludes Rhode Island.

TABLE 20.—Value of coal and products per net ton of coal carbonized in the United States, 1947–49 (average) and 1952–56

Year	Oven coke					Beehive coke	
	Value of coal per ton	Value per ton of coal				Value of coal per ton	Value per ton of coal
		Coke produced	Breeze produced	Coal chemical materials used or sold [1]	Total		
1947–49 (average)	$7.79	$8.49	$0.19	$2.85	$11.53	$4.90	$7.22
1952	9.23	10.18	.21	3.45	13.84	6.26	8.87
1953	9.24	10.30	.21	3.58	14.09	6.36	9.27
1954	9.00	11.12	.23	3.83	15.18	6.44	8.69
1955	8.84	11.44	.24	3.70	15.38	5.59	7.75
1956	9.35	12.46	.26	3.75	16.47	5.99	8.62

[1] Includes value of surplus gas and of tar and pitch-of-tar burned.

PREPARATION AND SOURCE OF COAL

Washed and Unwashed Coal.—Table 21 shows washed and unwashed coal carbonized in 1956. The use of washed or cleaned coal in the coke industry has increased tremendously since the end of World War II. Some of the reasons that the use of clean coal has been increasingly emphasized in the coke industry in recent years follow. Coke producers must use poorer grades that require some preparation because of steadily declining reserves of premium-quality coking coals in the Nation. Coal-mine mechanization has increased productivity, but it has also increased the refuse content of the coals. Table 22 shows the rapid increase in the use of washed coals since 1952. The leading gains in use of washed coals in the past 5 years occurred in Michigan, New York, West Virginia, and Indiana. In these 4 States only 49 percent of the coal charged into slot-type ovens in 1952 was washed compared with 82 percent in 1956. As these States obtained coking coals mostly from Pennsylvania and West Virginia, a substantial amount of cleaning capacity obviously has been installed at coal mines in these States in recent years. The percentage of washed coal used in Pennsylvania in 1956 as compared with 1952 did not increase as much as in the 4 States mentioned; however, the gain, more than 6 million tons, was the largest of any State. All coal used in Colorado was washed before carbonization; none of the coals used in Maryland, Massachusetts, or Tennessee was washed.

TABLE 21.—Washed and unwashed coal carbonized in the United States in 1956, by States in which used, in net tons

State	Slot-type ovens				Beehive ovens		
	Bituminous		Anthracite	Total	Bituminous		
	Washed	Unwashed			Washed	Unwashed	Total
Alabama	7,507,708	359,969	11,533	7,879,210			
California	1,388,890	299,397		1,688,287			
Colorado	1,131,129			1,131,129			
Illinois	2,248,980	1,681,028	8,148	3,938,156			
Indiana	10,789,362	1,533,457	38,965	12,361,784			
Maryland		4,198,946		4,198,946			
Massachusetts		834,161	18,248	852,409			
Michigan	4,283,627	386,814	75,325	4,745,766			
Minnesota	757,839	625,799	18,154	1,401,792			
New Jersey	865,306	740,849	18,161	1,624,316			
New York	3,912,005	1,517,697	684	5,430,386			
Ohio	13,067,294	3,659,872	46,003	16,773,169			
Pennsylvania	18,518,536	9,342,635	67,940	27,929,111	1,931,850	1,270,876	3,202,726
Tennessee		254,856	3,604	258,460			
Texas	641,628	232,545		874,173			
Utah	67,520	2,033,570		2,101,090	222,844		222,844
Virginia					185,491	133,619	319,110
West Virginia	4,271,598	1,721,543		5,993,141		170,123	170,123
Connecticut, Kentucky, Missouri, and Wisconsin	2,639,469	357,393	70,546	3,067,408	122,150	6,430	128,580
Total 1956	72,090,891	29,780,531	377,311	102,248,733	2,462,335	1,581,048	4,043,383
At merchant plants	7,947,837	4,908,506	323,272	13,179,615			
At furnace plants	64,143,054	24,872,025	54,039	89,069,118			
Total 1955	73,735,758	30,771,947	366,168	104,873,873	1,670,764	1,198,448	2,869,212

TABLE 22.—Quantity and percentage of bituminous coal carbonized in the United States that was washed, 1952–56

Year	Unwashed coal (net tons)			Washed coal (net tons)			Total coal carbonized (net tons)	Percentage of total washed
	At coke ovens	At beehive ovens	Total	At coke ovens	At beehive ovens	Total		
1952	41,296,504	4,534,222	45,830,726	49,406,131	2,377,425	51,783,556	97,614,282	53.0
1953	41,441,432	4,982,089	46,423,521	63,206,898	3,244,008	66,450,906	112,874,427	58.9
1954	27,091,705	593,203	27,684,908	57,318,895	386,443	57,705,338	85,390,246	67.6
1955	30,771,947	1,198,448	31,970,395	73,735,758	1,670,764	75,406,522	107,376,917	70.2
1956	29,780,531	1,581,048	31,361,579	72,090,891	2,462,335	74,553,226	105,914,805	70.4

Blending.—Blending or mixing coals before carbonization is the standard practice of the oven-coke industry. Coal blending has four main objectives: (1) To improve the physical quality and uniformity of the coke; (2) to control the pressure developed in the coke ovens by the carbonization process; (3) to control the yield of the products; and (4) to broaden the use of inferior coals for coke manufacture. The usual practice is to blend major proportions of high-volatile coals with minor proportions of low-volatile coal. The addition of low-volatile coal improves the physical structure of the coke and increases the coke yield. However, the quantity of low-volatile coal that can be added is limited because, beyond a certain proportion, coke quality changes slightly, but the expanding pressure causes damage to oven walls. Small quantities of anthracite fines were added to coking coals, especially in manufacturing foundry coke, when large sizes and increased resistance to shatter of the resultant coke were more important than decreased resistance to abrasion. A few plants, using low-rank coal, blended small quantities of pitch with the coal to improve coke quality; in other plants a small quantity of oil was added to increase gas yield or to increase bulk density of the coal charge.

Although blending or mixing two types of coal (high- and low-volatile) is the most common practice, some plants blend three types, high-, medium-, and low-volatile. A few plants mix or blend coals of one type only, such as all high- or all medium-volatile. In 1956, 75 of the 80 active oven-coke plants used coals of different volatile content. Of these, 52 (including 8 employing anthracite) used high- and low-volatile coals; 18 (including 7 employing anthracite) used high-, medium-, and low-; 1, high- and medium-; 4 (including 1 employing anthracite) used low- and medium-; 1 plant used only high-; and 4 used only medium-volatile.

Table 23 shows the types of coal carbonized in each State in 1956. Alabama consumed the greatest quantity of medium-volatile coal, largely because it is available locally. Indiana was the leading consumer of low-volatile coal; Pennsylvania led all States in using high-volatile coal, carbonizing one-third of the total used in coke ovens.

Source.—Ninety-four percent of the coking coal carbonized in the United States and 80 percent of Canada's requirements were obtained from deposits in the Appalachian region, extending from Alabama northeastward to Pennsylvania. Since the end of World War II, increasing tonnages have been shipped to European countries, and to various countries in Asia for conversion into metallurgical coke. Much smaller deposits suitable for metallurgical coke occur west of the Mississippi River in the Trinidad-Raton field of southern Colorado and northern New Mexico, the Sunnyside beds in the Castle Gate field of Utah, in Haskell and other counties in eastern Oklahoma, in Sebastian County in western Arkansas, and in Pierce and Kittitas Counties in Washington. Low-volatile coking coals, which are very important for improving the physical properties especially strength of metallurgical coke, come principally from West Virginia; central Pennsylvania, eastern Oklahoma, and western Arkansas furnish much smaller quantities. The origin and destination of coal used for oven coke are shown in detail in tables 24 and 25.

Many coke-producing companies, particularly those connected with iron and steel works, own or control coal mines. These "captive" mines supplied 63 percent of the total quantity used in slot-type ovens, 65 percent of the requirements for furnace plants and 43 percent for merchant plants. As indicated in table 26, the use of captive coal at oven-coke plants has risen substantially since 1947–49.

TABLE 23.—Coal shipped to oven-coke plants in the United States in 1956, by consuming States and volatile content,[1] in net tons

Coal consumed in—	High-volatile		Medium-volatile		Low-volatile		Total coal received (net tons)
	Net tons	Percent of total	Net tons	Percent of total	Net tons	Percent of total	
Alabama:							
Merchant plants	327,152	31.4	410,213	39.4	303,531	29.2	1,040,896
Furnace plants	185,057	2.7	6,659,922	96.5	54,740	.8	6,899,719
Total Alabama	512,209	6.5	7,070,135	89.0	358,271	4.5	7,940,615
California: Furnace plant	1,408,908	82.1			307,030	17.9	1,715,938
Colorado: Furnace plant	1,200,550	88.3			158,859	11.7	1,359,409
Illinois:							
Merchant plants	40,179	24.1	39,716	23.8	86,758	52.1	166,653
Furnace plants	2,717,262	72.0			1,055,178	28.0	3,772,440
Total Illinois	2,757,441	70.0	39,716	1.0	1,141,936	29.0	3,939,093
Indiana:							
Merchant plants	323,621	37.2	108,996	12.5	437,675	50.3	870,292
Furnace plants	5,996,196	51.8			5,582,986	48.2	11,579,182
Total Indiana	6,319,817	50.8	108,996	.9	6,020,661	48.3	12,449,474
Maryland: Furnace plant	2,810,260	64.0			1,582,336	36.0	4,392,596
Massachusetts: Merchant plant	465,024	53.2	212,017	24.2	198,085	22.6	875,126
Michigan:							
Merchant plants	477,352	50.2			472,988	49.8	950,340
Furnace plants	2,594,680	67.3	280,428	7.3	981,665	25.4	3,856,773
Total Michigan	3,072,032	63.9	280,428	5.8	1,454,653	30.3	4,807,113
Minnesota:							
Merchant plant	58,704	25.5	66,970	29.1	104,517	45.4	230,191
Furnace plants	791,301	64.2	86,281	7.0	354,118	28.8	1,231,700
Total Minnesota	850,005	58.1	153,251	10.5	458,635	31.4	1,461,891
New Jersey: Merchant plants	871,035	52.3	337,411	20.3	455,907	27.4	1,664,353
New York:							
Merchant plant	851,573	77.7			244,913	22.3	1,096,486
Furnace plants	2,834,888	64.0	74,843	1.7	1,518,975	34.3	4,428,706
Total New York	3,686,461	66.7	74,843	1.4	1,763,888	31.9	5,525,192
Ohio:							
Merchant plants	767,384	52.4	121,335	8.3	575,827	39.3	1,464,546
Furnace plants	11,543,422	75.1	172,891	1.1	3,650,908	23.8	15,367,221
Total Ohio	12,310,806	73.1	294,226	1.8	4,226,735	25.1	16,831,767
Pennsylvania:							
Merchant plants	330,114	37.1	367,734	41.4	190,755	21.5	888,603
Furnace plants	22,417,796	80.5	1,049,831	3.8	4,393,495	15.7	27,861,122
Total Pennsylvania	22,747,910	79.1	1,417,565	4.9	4,584,250	16.0	28,749,725
Tennessee: Furnace plant	77,287	28.3	153,706	56.2	42,360	15.5	273,353
Texas: Furnace plants	673,165	76.4	128,135	14.5	80,264	9.1	881,564
Utah: Furnace plants	1,479,470	69.0	428,439	20.0	234,770	11.0	2,142,679
West Virginia:							
Merchant plants	1,023,618	92.5			83,552	7.5	1,107,170
Furnace plants	4,163,544	83.6			815,053	16.4	4,978,597
Total West Virginia	5,187,162	85.2			898,605	14.8	6,085,767
Connecticut, Kentucky, Missouri, and Wisconsin: Merchant plants	1,861,834	61.0	242,410	7.9	948,353	31.1	3,052,597
Grand total	68,291,376	65.6	10,941,278	10.5	24,915,598	23.9	104,148,252
At merchant plants	7,397,590	55.2	1,906,802	14.2	4,102,861	30.6	13,407,253
At furnace plants	60,893,786	67.1	9,034,476	10.0	20,812,737	22.9	90,740,999

[1] High-volatile—dry volatile matter over 31 percent; medium-volatile—dry volatile matter 31 percent or less and over 22 percent; low-volatile—dry volatile matter 22 percent or less and over 14 percent.

TABLE 24.—Origin of coal shipped to oven-coke plants in the United States in 1956, by producing fields and volatile content, in net tons

State and field [1] where coal was produced	Volatile content [2]			Tota
	High	Medium	Low	
Alabama	632,313	6,966,081		7,598,394
Arkansas			395,187	395,187
Colorado	1,333,498	154,002		1,487,500
Illinois	570,515			570,515
Kentucky:				
Elkhorn	5,619,809			5,619,809
Harlan	5,018,900			5,018,900
Kenova-Thacker	813,872			813,872
New Mexico	18,831			18,831
Oklahoma	553,061	335,052	385,736	1,273,849
Pennsylvania:				
Anthracite			453,859	453,859
Bituminous:				
Central Pennsylvania	92,090		4,950,825	5,042,915
Connellsville	11,167,782			11,167,782
Freeport	3,878,413			3,878,413
Pittsburgh	13,793,111	532,403		14,325,514
Somerset			831,744	831,744
Westmoreland	249,327			249,327
Tennessee		221,831		221,831
Utah	2,736,599			2,736,599
Virginia:				
Buchanan	165,649	139,258		304,907
Clinch Valley		354,840		354,840
Pocahontas			450,830	450,830
Southwestern	1,376,677			1,376,677
West Virginia:				
Coal River	285,943			285,943
Fairmont	7,083,325			7,083,325
Kanawha	6,958,346	350,484		7,308,830
Kenova-Thacker	497,967			497,967
Logan	3,720,075	338,475		4,058,550
New River	236,057	487,097	740,863	1,464,017
Pochantas			14,075,097	14,075,097
Randolph-Barbour	440,478	148,488		588,966
Tug River			463,253	463,253
Webster-Gauley	1,048,738	750,772		1,799,510
Winding Gulf		94,975	2,168,204	2,263,179
Canada		67,520		67,520
Total	68,291,376	10,941,278	24,915,598	104,148,252

[1] As defined by the U. S. Coal Commission of 1922.
[2] High-volatile—dry volatile matter over 31 percent; medium-volatile—dry volatile matter 31 percent or less and over 22 percent; low-volatile—dry volatile matter 22 percent or less and over 14 percent.

TABLE 25.—Origin and destination of coal shipped to oven-coke plants in the United States in 1956, by States, in net tons

Coal consumed in—	Coal produced in— Alabama	Arkansas	Colorado	Illinois	Kentucky	New Mexico	Oklahoma	Pennsylvania	Tennessee	Utah	Virginia	West Virginia	Canada	Total
Alabama:														
Merchant plants	737, 365							18, 525				285, 006		1, 040, 896
Furnace plants	6, 740, 925							11, 452	104, 054			43, 288		6, 899, 719
Total Alabama	7, 478, 290							29, 977	104, 054			328, 294		7, 940, 615
California: Furnace plant		181, 157				18, 831	125, 873			1, 390, 077				1, 715, 938
Colorado: Furnace plant		158, 859	1, 200, 550											1, 359, 409
Illinois:														
Merchant plants								6, 162			17, 923	142, 568		166, 653
Furnace plants				474, 605	1, 541, 410						153, 720	1, 602, 705		3, 772, 440
Total Illinois				474, 605	1, 541, 410			6, 162			171, 643	1, 745, 273		3, 939, 093
Indiana:														
Merchant plants								49, 218			38, 483	782, 591		870, 292
Furnace plants				95, 910	4, 864, 856						501, 270	6, 117, 146		11, 579, 182
Total Indiana				95, 910	4, 864, 856			49, 218			539, 753	6, 899, 737		12, 449, 474
Maryland: Furnace plant								369, 769			6, 462	4, 016, 365		4, 392, 596
Massachusetts: Merchant plant					431			40, 965				833, 730		875, 126
Michigan:														
Merchant plants					10, 383			67, 881			65, 066	807, 010		950, 340
Furnace plants					1, 146, 872			308, 517			482, 765	1, 918, 619		3, 856, 773
Total Michigan					1, 157, 255			376, 398			547, 831	2, 725, 629		4, 807, 113
Minnesota:														
Merchant plant								23, 682				206, 509		230, 191
Furnace plant					479, 073							752, 627		1, 231, 700
Total Minnesota					479, 073			23, 682				959, 136		1, 461, 891
New Jersey: Merchant plants								31, 438			81, 855	1, 551, 060		1, 664, 353
New York:														
Merchant plant					221, 742			390, 393			14, 869	469, 482		1, 096, 486
Furnace plant					305, 386			2, 925, 794			406, 257	791, 269		4, 428, 706
Total New York					527, 128			3, 316, 187			421, 126	1, 260, 751		5, 525, 192

TABLE 25.—Origin and destination of coal shipped to oven-coke plants in the United States in 1956, by States, in net tons—Continued

Coal consumed in—	Coal produced in—													
	Alabama	Arkansas	Colorado	Illinois	Kentucky	New Mexico	Oklahoma	Pennsylvania	Tennessee	Utah	Virginia	West Virginia	Canada	Total
Ohio:														
Merchant plants								49,065			130,851	1,284,630		1,464,546
Furnace plants					2,409,229			6,055,621			416,495	6,485,876		15,367,221
Total Ohio					2,409,229			6,104,686			547,346	7,770,506		16,831,767
Pennsylvania:														
Merchant plants								48,135				840,468		888,603
Furnace plants					383,572			21,358,812			31,113	6,087,625		27,861,122
Total Pennsylvania					383,572			21,406,947			31,113	6,928,093		28,749,725
Tennessee: Furnace plant								3,642	117,777		113,216	38,718		273,353
Texas: Furnace plants	120,104						761,460							881,564
Utah: Furnace plants		55,171	286,950				386,516			1,346,522			67,520	2,142,679
West Virginia:														
Merchant plants								83,552				1,023,618		1,107,170
Furnace plants								4,032,862				945,735		4,978,597
Total West Virginia								4,116,414				1,969,353		6,085,767
Connecticut, Kentucky, Missouri, and Wisconsin: Merchant plants					89,627			74,069			26,909	2,861,992		3,052,597
Grand total	7,598,394	395,187	1,487,500	570,515	11,452,581	18,831	1,273,849	35,949,554	221,831	2,736,599	2,487,254	39,888,637	67,520	104,148,252
At merchant plants	737,365				322,183			883,085			375,956	11,088,664		13,407,253
At furnace plants	6,861,029	395,187	1,487,500	570,515	11,130,398	18,831	1,273,849	35,066,469	221,831	2,736,599	2,111,298	28,799,973	67,520	90,740,999

CONSUMPTION OF COKE

The apparent consumption of coke in the United States, allowing for imports, exports, and changes in producers' stocks, decreased 4 percent from 1955 but was 5 percent above 1947–49. The decrease in consumption from 1955 was caused entirely by the reduction in blast-furnace-coke consumption, as more coke was used for other purposes in 1956 than in the 2 preceding years. The tonnage of coke used in all applications other than in blast furnaces was 43 percent below the average tonnage in 1947–49. The two major uses of coke that have decreased the most since that time were gas manufacture and residential heating.

The smelting of iron ore in blast furnaces in the United States used over 89 percent of all oven and beehive coke consumed in 1956. Iron blast furnaces have utilized the bulk of our annual coke production for the past 50 years, and at the end of 1956 it appeared that even larger proportions would be required in the future. Although the tonnage will doubtless continue to climb, the quantity of coke required to make 1 ton of pig iron should decline. The fuel efficiency in blast furnaces will be improved by better coal-cleaning and blending facilities, enrichment of iron ores through the many beneficiation procedures now being employed, and advancements in blast-furnace operating techniques. In 1956, the coke-to-pig ratio was the lowest on record, although the actual reduction was not quite as large as table 28 indicates. This table shows a reduction in coke consumption of 42 pounds per ton of pig iron, including ferroalloys produced, and 46 pounds per ton of pig iron produced. These figures were based on the net coke actually charged into the furnaces; the figures for previous years are based on total coke consumption, which in some instances included screenings. If coke-to-metal ratios for 1956 were calculated on the same basis as in preceding years, quantity would be reduced by about 13 pounds for pig iron and ferroalloys and 18 pounds for pig iron.

Tables 29 and 30 summarize the disposal of oven and beehive coke in 1956, by principal end uses. A large part of the oven-coke output is used by producers in integrated blast furnaces and chemical works; nearly all of the beehive production is shipped outside the plants. Iron foundries, various industrial plants, and the residential heating market, as shown in table 29, are supplied almost entirely from merchant oven-coke plants. Some beehive coke was shipped to the same consumers, but over 84 percent was sent to iron blast furnaces.

TABLE 26.—Quantity and percentage of captive coal received by oven-coke plants in the United States, 1947–49 (average) and 1952–56

Year	At merchant plants			At furnace plants			Total		
	Total coal received	Captive coal		Total coal received	Captive coal		Total coal received	Captive coal	
		Quantity	Percent		Quantity	Percent		Quantity	Percent
1947–49 (average)	18, 321, 004	5, 286, 361	28. 9	76, 138, 301	48, 371, 093	63. 5	94,459,305	53, 657, 454	56. 8
1952	15, 747, 658	5, 542, 423	35. 2	75, 452, 183	47, 290, 610	62. 7	91,199,841	52, 833, 033	57. 9
1953	15, 365, 899	5, 923, 998	38. 6	90, 710, 334	60, 121, 968	66. 3	106,076,233	66, 045, 966	62. 3
1954	9, 670, 190	4, 049, 080	41. 9	73, 615, 703	51, 828, 722	70. 4	83,285,893	55, 877, 802	67. 1
1955	12, 801, 963	5, 467, 619	42. 7	93, 865, 894	63, 205, 881	67. 3	106,667,857	68, 673, 500	64. 4
1956	13, 407, 253	5, 740, 551	42. 8	90, 740, 999	59, 378, 485	65. 4	104,148,252	65, 119, 036	62. 5

TABLE 27.—Apparent consumption of coke in the United States, 1947–49 (average) and 1952–56, in net tons

Year	Total production	Imports	Exports	Net change in stocks	Apparent United States consumption [1]	Consumption			
						Iron furnaces [2]		All other purposes	
						Quantity	Percent	Quantity	Percent
1947–49 (average)	70, 648, 402	181, 000	696, 699	+280, 230	69, 852, 473	55, 877, 463	80. 0	13, 975, 010	20. 0
1952	68, 254, 109	312, 519	792, 072	+418, 685	67, 355, 871	57, 969, 044	86. 1	9, 386, 827	13. 9
1953	78, 836, 857	157, 318	520, 252	+778, 051	77, 695, 872	69, 596, 514	89. 6	8, 099, 358	10. 4
1954	59, 662, 496	115, 781	387, 575	+269, 132	59, 121, 570	51, 741, 260	87. 5	7, 380, 310	12. 5
1955	75, 301, 826	126, 342	530, 505	−1, 248, 069	76, 145, 732	68, 506, 721	90. 0	7, 639, 011	10. 0
1956	74, 454, 264	130, 955	655, 717	+633, 670	73, 295, 832	65, 289, 270	89. 1	8, 006, 562	10. 9

[1] Production plus imports minus exports, plus or minus net change in stocks.
[2] American Iron and Steel Institute; figures include coke consumed manufacturing ferroalloys.

TABLE 28.—Coke and coking coal consumed per net ton of pig iron produced in the United States, 1913, 1918, 1929, 1939, 1947–49 (average), and 1955–56

Year	Coke per net ton of pig iron and ferroalloys [1] (pounds)	Yield of coke from coal (percent)	Coking coal per net ton of pig iron and ferroalloys (pounds calculated)	Year	Coke per net ton of pig iron and ferroalloys [1] (pounds)	Yield of coke from coal (percent)	Coking coal per net ton of pig iron and ferroalloys (pounds calculated)
1913	2, 172. 6	66. 9	3, 247. 5	1947–49 (av.)	1, 919. 7	69. 7	2, 754. 2
1918	2, 120. 7	66. 4	3, 193. 8	1955	1, 761. 3	69. 9	2, 519. 7
1929	1, 838. 0	69. 0	2, 663. 8	1956	1, 719. 1	70. 1	2, 452. 4
1939	1, 778. 0	69. 8	2, 547. 3				

[1] American Iron and Steel Institute; consumption per ton of pig iron only, excluding furnaces making ferroalloys, was 2,172.6 pounds in 1913, 2,120.7 in 1918, 1,813.3 in 1929, 1,760.0 in 1939, 1,892.8 in 1947–49 (average), 1,745.9 in 1955, and 1,699.7 in 1956.

TABLE 29.—Oven coke produced, used by producers, and sold in the United States in 1956, by States

State	Produced		Used by producing companies—				Commercial sales	
			In blast furnaces		For other purposes [1]		To blast-furnace plants	
	Net tons	Value	Net tons	Value	Net tons	Value	Net tons	Value
Alabama	5, 763, 749	$111, 219, 091	4, 595, 982	$87, 256, 188	67, 879	$1, 666, 980	119, 804	(2)
California	1, 032, 375	(2)	1, 031, 283	(2)	353	(2)		
Colorado	748, 440	(2)	725, 878	(2)	5, 037	(2)		
Illinois	2, 802, 223	51, 791, 553	2, 509, 476	46, 861, 967	68, 674	1, 369, 707	95, 029	(2)
Indiana	8, 920, 369	186, 181, 917	8, 184, 722	170, 163, 830	12, 557	228, 702	73, 706	(2)
Maryland	3, 050, 420	(2)	2, 981, 265	(2)	8, 274	(2)		
Massachusetts	608, 052	(2)	60, 158	(2)	39, 239	(2)	82, 876	(2)
Michigan	3, 531, 031	67, 116, 136	2, 475, 159	(2)	271, 686	5, 688, 228	183, 107	(2)
Minnesota	1, 012, 564	19, 857, 956	696, 581	(2)	3, 935	50, 201	97, 107	(2)
New Jersey	1, 223, 050	(2)			105, 311	(2)	517, 159	(2)
New York	3, 825, 368	58, 552, 685	3, 134, 166	46, 466, 228	39, 415	626, 401	633, 547	(2)
Ohio	11, 799, 045	201, 232, 720	10, 477, 485	177, 358, 614	142, 600	2, 805, 773	564, 618	$8, 774, 002
Pennsylvania	19, 098, 406	316, 661, 062	17, 382, 444	288, 149, 298	143, 510	2, 089, 095	839, 042	13, 093, 882
Tennessee	206, 196	(2)	141, 502	(2)	42, 245	(2)		
Texas	645, 830	(2)	585, 149	(2)	11, 892	(2)		
Utah	1, 334, 976	(2)	1, 272, 502	(2)	6, 314	(2)		
West Virginia	4, 197, 403	60, 823, 375	3, 324, 208	51, 667, 246	755, 142	7, 699, 311	58, 794	(2)
Connecticut, Kentucky, Missouri, and Wisconsin	2, 192, 745	37, 881, 051			64, 105	1, 113, 973	1, 398, 691	19, 641, 057
Undistributed		162, 896, 234		184, 043, 316		4, 072, 478		31, 696, 854
Total 1956	71, 992, 242	1, 274, 213, 780	59, 577, 960	1, 051, 966, 687	1, 788, 168	27, 410, 849	4, 663, 480	73, 205, 795
At merchant plants	9, 575, 194	175, 633, 398	60, 158	(3)	1, 398, 359	18, 547, 218	3, 778, 344	59, 130, 588
At furnace plants	62, 417, 048	1, 098, 580, 382	59, 517, 802	(3)	389, 809	8, 863, 631	885, 136	14, 075, 207
Total 1955	73, 584, 214	1, 199, 630, 173	62, 195, 976	1, 013, 377, 890	2, 048, 173	30, 029, 519	4, 686, 067	67, 130, 433

TABLE 29.—Oven coke produced, used by producers, and sold in the United States in 1956, by States—Continued

State	Commercial sales—Continued							
	To foundries		To other industrial plants [4]		For residential heating		Total	
	Net tons	Value	Net tons	Value	Net tons	Value	Net tons	Value
Alabama	544,613	$13,787,552	274,203	(2)	46,383	$578,379	985,003	$20,214,380
California			486	(2)			486	(2)
Colorado	588	(2)	16,907	(2)	30	(2)	17,525	(2)
Illinois	36,377	(2)	55,577	$589,709	9,270	147,357	196,253	3,377,949
Indiana	390,752	(2)	147,875	2,208,333	46,545	587,197	658,878	14,393,927
Maryland								
Massachusetts	106,237	(2)	101,862	(2)	230,141	(2)	521,116	(2)
Michigan	359,488	(2)	194,882	2,764,039	41,597	678,085	779,074	16,181,159
Minnesota	122,133	(2)	52,636	809,797	11,779	(2)	283,655	6,066,070
New Jersey	80,163	(2)	209,243	(2)	262,867	(2)	1,069,432	(2)
New York	2,338	(2)	45,546	(2)	2,339	(2)	683,770	(2)
Ohio	303,322	7,974,049	189,290	2,330,444	21,692	285,659	1,078,922	19,364,154
Pennsylvania	226,935	6,063,970	219,553	2,669,819	92,174	1,332,810	1,377,704	23,160,481
Tennessee	19,144	(2)	4,249	(2)			23,393	(2)
Texas			20,251	(2)			20,251	(2)
Utah			34,558	(2)	965	(2)	35,523	(2)
West Virginia	7	(2)	53,900	528,510	40	(2)	112,741	1,338,148
Connecticut, Kentucky, Missouri, and Wisconsin	467,139	13,025,530	145,519	2,272,770	140,098	2,272,516	2,151,447	37,211,873
Undistributed		29,627,846		11,173,663		8,882,250		42,487,938
Total 1956	2,659,236	70,478,947	1,766,537	25,347,084	905,920	14,764,253	9,995,173	183,796,079
At merchant plants	2,442,341	64,760,205	950,072	16,087,647	854,944	14,159,968	8,025,701	154,138,408
At furnace plants	216,895	5,718,742	816,465	9,259,437	50,976	604,285	1,969,472	29,657,671
Total 1955	2,899,488	68,877,334	1,732,022	22,468,759	1,119,466	16,906,354	10,437,043	175,382,880

[1] Comprises 251,199 tons valued at $6,521,783 used in foundries; 172,796 tons, $2,542,612 to make producer gas; 848,915 tons, $9,234,267 to make water gas; and 515,258 tons, $9,112,187 for other purposes.
[2] Included with "Undistributed" to avoid disclosing individual company figures.
[3] Concealed to avoid disclosing individual company figures.
[4] Includes 90,113 tons valued at $1,593,789 to water-gas plants.

TABLE 30.—Beehive-coke produced, used by producers, and sold in the United States in 1956, by States

State	Produced		Used by producing companies—				Commercial sales	
			In blast furnaces		For other purposes		To blast-furnace plants	
	Net tons	Value	Net tons	Value	Net tons	Value	Net tons	Value
Kentucky	73, 269	(1)					73, 167	(1)
Pennsylvania	2, 005, 590	$27, 713, 371	335, 531	$4, 858, 485			1, 468, 641	$20, 437, 620
Utah	112, 755	(1)						
Virginia	165, 968	2, 555, 797					110, 457	1, 748, 985
West Virginia	104, 440	1, 476, 830					82, 362	(1)
Undistributed		3, 103, 288						2, 126, 966
Total 1956	2, 462, 022	34, 849, 286	335, 531	4, 858, 485			1, 734, 627	24, 313, 571
Total 1955	1, 717, 612	22, 231, 455	126, 988	1, 744, 621			1, 162, 935	14, 618, 029

State	Commercial sales—Continued							
	In foundries		To other industrial plants		For residential heating		Total	
	Net tons	Value	Net tons	Value	Net tons	Value	Net tons	Value
Kentucky	61	(1)					73, 228	(1)
Pennsylvania	27, 157	$443, 294	164, 221	(1)	5, 122	(1)	1, 665, 141	$22, 800, 188
Utah			111, 807	(1)			111, 807	(1)
Virginia	8, 013	(1)	45, 339	$638, 895	1, 394	(1)	165, 203	2, 543, 262
West Virginia	6, 110	(1)	14, 258	210, 485			102, 730	1, 455, 285
Undistributed		242, 125		3, 954, 396		$80, 881		3, 084, 912
Total 1956	41, 341	685, 419	335, 625	4, 803, 776	6, 516	80, 881	2, 118, 109	29, 883, 647
Total 1955	42, 964	646, 711	379, 954	5, 173, 538	6, 509	70, 949	1, 592, 452	20, 509, 227

[1] Included with "Undistributed" to avoid disclosing individual company figures.

DISTRIBUTION OF OVEN AND BEEHIVE COKE

Coke and coke breeze have many industrial applications and widespread geographic distribution. In 1956 every State and the District of Columbia used coke. In addition, United States coke was shipped to Canada and about 12 foreign countries. The iron and steel industry consumed the larger part of the coke and coke breeze shipped by producers in 1956. Obviously, the leading coke-consuming States were those that produced the greatest quantity of pig iron. Pennsylvania led the States in using coke and coke breeze: it consumed 27 percent of all large coke and 22 percent of the coke breeze. Ohio, Indiana, Illinois, and Alabama combined used 43 percent of the coke and 35 percent of the breeze in 1956.

Coke was distributed to 18 States for blast-furnace use: 46 States and the District of Columbia used coke in iron foundries, 5 for making producing gas, 12 for manufacturing water gas, 47 States and the District of Columbia for other industrial uses, 36 for residential heating, and 40 for coke breeze. The leading States in blast-furnace-coke consumption were Pennsylvania, Ohio, Indiana, Illinois, and Alabama. Michigan was the leading user of foundry coke, and

Pennsylvania was the leading user of coke in producer-gas manufacture and for other industrial uses. West Virginia led in coke consumed in water-gas manufacture for synthetic ammonia and methanol, and New Jersey in the quantity used for residential heating.

TABLE 31.—Distribution of oven and beehive coke and breeze in 1956, in net tons

[Based upon reports from producers showing destination and principal end use of coke used or sold. Does not include imported coke, which totaled 130,955 tons in 1956]

Consuming State	Coke							Breeze
	To blast-furnace plants	To foundries	To producer-gas plants	To water-gas plants	To other industrial plants	For residential heating	Total	
Alabama	4,589,056	204,032	-------	-------	53,526	16,744	4,863,358	266,453
Arizona	-------	163	-------	-------	-------	-------	163	77
Arkansas	-------	2,575	-------	-------	2,390	-------	4,965	455
California	1,031,283	71,474	-------	-------	69,291	37	1,172,085	76,080
Colorado	725,878	16,408	-------	-------	21,306	30	763,622	68,036
Connecticut	-------	38,249	43,943	9,249	2,229	103,471	197,141	45,888
Delaware	-------	1,833	-------	-------	341	161	2,335	7,207
District of Columbia	-------	53	-------	-------	419	-------	472	-------
Florida	-------	2,759	-------	17,827	16,600	576	37,762	46,000
Georgia	-------	14,827	-------	-------	3,751	7,088	25,666	1,248
Idaho	-------	889	-------	-------	68,026	92	69,007	59,937
Illinois	5,226,548	267,472	-------	-------	94,043	35,663	5,623,726	190,111
Indiana	6,967,179	164,493	-------	3,395	83,409	37,397	7,255,873	441,466
Iowa	-------	43,846	-------	-------	14,856	2,049	60,751	8,394
Kansas	-------	13,954	-------	-------	203	-------	14,157	1,554
Kentucky	538,676	32,644	-------	-------	146,229	5,403	722,952	58,207
Louisiana	-------	3,308	-------	-------	66,015	332	69,655	724
Maine	-------	3,793	-------	18,130	93	9,998	32,014	-------
Maryland	2,981,381	20,500	-------	-------	11,538	-------	3,013,419	194,794
Massachusetts	73,421	58,642	32,416	18,356	10,780	192,152	385,767	56,232
Michigan	2,969,421	521,750	-------	-------	177,240	31,574	3,699,985	240,882
Minnesota	590,905	25,536	-------	669	21,409	10,612	649,131	64,161
Mississippi	-------	1,066	-------	-------	106	-------	1,172	-------
Missouri	-------	70,125	-------	-------	18,201	175	88,501	2,845
Montana	-------	1,574	-------	-------	19,804	-------	21,378	30,630
Nebraska	-------	4,229	-------	-------	12,043	-------	16,272	481
Nevada	-------	-------	-------	-------	3,090	-------	3,090	1,580
New Hampshire	-------	3,511	-------	-------	87	9,419	13,017	-------
New Jersey	-------	82,745	46,073	57,716	79,097	202,116	467,747	101,597
New Mexico	-------	1,001	-------	-------	210	184	1,395	205
New York	4,139,474	135,913	-------	-------	144,484	70,397	4,490,268	244,636
North Carolina	-------	15,891	-------	1,512	13,962	2,861	34,226	22,895
North Dakota	-------	310	-------	-------	118	273	701	-------
Ohio	13,077,587	364,918	-------	20,237	365,583	21,822	13,850,147	717,078
Oklahoma	-------	6,004	-------	-------	1,988	-------	7,992	7,135
Oregon	-------	6,296	-------	-------	17,667	-------	23,963	4,758
Pennsylvania	19,197,038	218,341	50,073	15,132	433,817	87,239	20,001,640	1,039,011
Rhode Island	-------	13,450	-------	-------	729	15,904	30,083	-------
South Carolina	-------	5,509	-------	-------	22,867	824	29,200	8,150
South Dakota	-------	520	-------	-------	279	27	826	-------
Tennessee	193,732	94,576	-------	-------	126,220	1,873	416,401	191,487
Texas	596,206	76,203	-------	-------	83,381	795	756,585	76,757
Utah	1,272,502	15,230	-------	-------	37,366	873	1,325,971	79,712
Vermont	-------	4,950	-------	-------	513	2,524	7,987	-------
Virginia	130,906	54,864	-------	2,827	32,548	888	222,033	14,145
Washington	-------	8,310	-------	-------	12,044	-------	20,354	4,508
West Virginia	1,840,643	10,884	-------	754,478	30,108	67	2,636,180	212,914
Wisconsin	-------	150,775	291	-------	11,502	30,729	193,297	29,909
Wyoming	-------	-------	-------	-------	2,620	-------	2,620	-------
Total	66,141,836	2,856,395	172,796	919,528	2,334,128	902,369	73,327,052	4,618,339
Exported	169,762	95,381	-------	19,529	193,150	10,067	487,889	36,982
Grand total	66,311,598	2,951,776	172,796	939,057	2,527,278	912,436	73,814,941	4,655,321

STOCKS OF COKE AND COKING COAL

Coke.—Stocks of oven coke at producing plants increased 37 percent in 1956; during July over one-half million tons was added to inventories because of the steel strike. Stocks continued to climb during August and on the 31st were the highest since July 1, 1954. Stocks began to decline in September and dropped each month for the remainder of the year. At the end of the year, stocks of oven coke at furnace plants were 38 percent higher than a year earlier and were equivalent to 10.2 days' production at the prevailing rate. Merchant-plant stocks did not increase as much, rising only 29 percent, and at the end of the year were equivalent to 15.4 days' production.

Table 32 shows stocks of oven and beehive coke according to grade or use. Stocks of all grades increased, but the largest gain occurred in blast-furnace coke.

Normally little beehive coke is stocked by producers, and changes in beehive-coke stocks are insignificant. The total quantity in producers' hands at the end of the year amounted to 1.6 days' production.

TABLE 32.—Producers' stocks of coke and breeze in the United States on Dec. 31, 1956, by States, in net tons

State	Coke				Breeze
	Blast furnace	Foundry	Residential heating and other	Total	
Oven coke:					
Alabama	388,417	2,963	14,802	406,182	34,367
California	13,291			13,291	
Colorado	24,299			24,299	2,289
Illinois	104,778		340	105,118	39,316
Indiana	172,315	2,451	13,680	188,446	336,163
Maryland	104,868			104,868	15,186
Massachusetts	42,161	610	41,307	84,078	
Michigan	25,069	3,688	24,238	52,995	13,031
Minnesota	19,611	4,410	12,957	36,978	11,415
New Jersey	15,468	180	46,199	61,847	22,749
New York	91,819		405	92,224	90,954
Ohio	278,756	8,580	36,625	323,961	121,243
Pennsylvania	448,887	5,624	11,188	465,699	176,934
Tennessee	18,031	4,424	2,884	25,339	5,624
Texas	37,887	455		38,342	908
Utah	174,222			174,222	29,142
West Virginia	29,410		9,577	38,987	29,862
Connecticut, Kentucky, Missouri, and Wisconsin	25,239	29,682	30,778	85,699	11,719
Total 1956	2,014,528	63,067	244,980	2,322,575	940,902
At merchant plants	140,894	49,924	210,872	401,690	74,610
At furnace plants	1,873,634	13,143	34,108	1,920,885	866,292
Total 1955	1,460,252	47,506	189,442	1,697,200	759,103
Beehive coke:					
Kentucky	41			41	
Pennsylvania	7,297		13	7,310	
Utah			1,362	1,362	
Virginia	1,196		60	1,256	144
West Virginia	1,897			1,897	
Total 1956	10,431		1,435	11,866	144
Total 1955	2,842	20	709	3,571	187

TABLE 33.—Producers' month-end stocks of oven coke in the United States, 1955–56, in net tons

[Includes blast-furnace, foundry, and residential-heating coke]

Month	Furnace plants		Merchant plants		Total	
	1955	1956	1955	1956	1955	1956
January	1, 653, 676	1, 433, 392	1, 093, 962	215, 281	2, 747, 638	1, 648, 673
February	1, 632, 095	1, 479, 398	981, 426	155, 291	2, 613, 521	1, 634, 689
March	1, 579, 178	1, 534, 695	946, 484	138, 953	2, 525, 662	1, 673, 648
April	1, 529, 245	1, 566, 503	955, 934	176, 269	2, 485, 179	1, 742, 772
May	1, 373, 176	1, 650, 097	972, 865	238, 311	2, 346, 041	1, 888, 408
June	1, 226, 880	1, 643, 915	960, 757	295, 124	2, 187, 637	1, 939, 039
July	1, 197, 727	2, 184, 779	914, 264	448, 827	2, 111, 991	2, 633, 606
August	1, 249, 569	2, 436, 797	806, 226	526, 140	2, 055, 795	2, 962, 937
September	1, 291, 359	2, 304, 146	683, 772	506, 686	1, 975, 131	2, 810, 832
October	1, 239, 855	2, 107, 352	541, 649	477, 018	1, 781, 504	2, 584, 370
November	1, 318, 911	2, 003, 412	428, 625	438, 658	1, 747, 536	2, 442, 070
December	1. 386, 486	1, 920, 885	310, 714	401, 690	1, 697, 200	2, 322, 575

Coking Coal.—Coking-coal stocks are extremely important to oven-coke-plant operators because slot-type ovens cannot be operated intermittently, and an adequate coal supply is necesssary at all times to insure continuous operations. A 30-day supply of bituminous

TABLE 34.—Month-end stocks of bituminous coal at oven-coke plants in the United States, 1952–56, in net tons

Month	1952	1953	1954	1955	1956
January	14, 827, 371	13, 400, 118	14, 885, 244	11, 506, 274	12, 561, 742
February	15, 786, 416	13, 381, 865	14, 729, 885	11, 065, 243	12, 341, 898
March	16, 726, 606	13, 278, 027	13, 886, 998	10, 776, 055	12, 839, 544
April	16, 652, 421	13, 408, 394	12, 856, 055	10, 693, 689	12, 865, 107
May	16, 799, 063	13, 898, 342	12, 595, 826	11, 515, 962	13, 605, 645
June	16, 894, 290	14, 537, 894	12, 659, 445	12, 745, 576	14, 004, 567
July	16, 135, 572	13, 220, 760	11, 125, 064	12, 342, 332	13, 060, 538
August	16, 066, 471	14, 698, 394	11, 571, 296	13, 665, 828	13, 366, 033
September	15, 728, 472	15, 910, 098	11, 869, 082	13, 993, 102	13, 521, 835
October	14, 436, 545	16, 609, 099	12, 192, 655	13, 892, 194	14, 005, 637
November	13, 637, 219	16, 719, 776	12, 484, 403	13, 603, 970	14, 093, 446
December	14, 429, 783	16, 485, 527	12, 356, 618	13, 342, 972	13, 893, 561

TABLE 35.—Month-end stocks of anthracite at oven-coke plants in the United States, 1952–56, in net tons

Month	1952	1953	1954	1955	1956
January	46, 933	44, 803	72, 594	46, 725	57, 683
February	38, 495	35, 389	63, 369	37, 982	41, 748
March	34, 719	32, 513	54, 288	26, 745	29, 469
April	30, 506	33, 480	48, 211	31, 861	30, 301
May	29, 399	44, 524	37, 244	40, 726	40, 024
June	42, 216	58, 561	45, 822	53, 248	52, 716
July	41, 583	57, 989	44, 525	55, 974	59, 886
August	45, 300	60, 010	47, 788	55, 529	95, 156
September	43, 865	61, 559	44, 858	59, 886	85, 754
October	50, 148	70, 066	50, 736	63, 243	113, 610
November	58, 422	74, 386	56, 856	73, 281	138, 879
December	54, 720	79, 381	54, 130	80, 464	146, 581

coal is generally considered to be the minimum. For several years, however, the supply of coal at oven-coke plants has not dropped below 38 days' requirements. In 1956 stocks of bituminous coal fluctuated from a high of 53 days' supply in August to a low of 41 days in February. At the end of the year producers had 46 days' supply, at the prevailing consuming rate, compared with 44 days at the end of 1955.

ASSIGNED VALUE AND PRICE

The assigned values and average receipts per ton for both oven and beehive coke increased to new peaks in 1956. The assigned value per ton of oven coke increased $1.40 or 9 percent over 1955 while value of beehive coke advanced $1.21 or 9 percent. Increased coal costs (labor and transportation) in recent years have caused coke costs to rise and are reflected in the assigned values, which in 1956 were 47 percent for oven and 25 percent for beehive over the average for 1947–49. Coke prices, or the average receipts per ton for oven coke, reached a new peak; the price for beehive coke was the highest in 3 years. The average receipts per ton of oven coke sold were $1.59 higher than in 1955, and beehive coke gained $1.23.

The largest price gain was in the oven coke sold to iron foundries. According to data reported by coke producers, the average receipts per net ton of oven-foundry coke increased $2.75. Beehive coke sold for residential heating averaged $1.66 per ton higher than in 1955, and the average price for sales of beehive blast-furnace coke rose $1.45 per ton. Oven coke sold to other industrial plants increased $1.38; the smallest gain, only $0.69, was in beehive coke sold to other industrial plants. Detailed statistics on average values and receipts for oven and beehive coke are given in tables 36 and 37.

TABLE 36.—Average value per net ton of coke produced and average receipts per net ton from coke sold (commercial sales) in the United States, 1947–49 (average) and 1952–56

Year	Value per ton produced [1]			Receipts per ton sold		
	Oven coke	Beehive coke	Total	Oven coke	Beehive coke	Total
1947–49 (average)	$12.08	$11.32	$12.02	$13.87	$11.95	$13.41
1952	14.49	13.92	14.45	17.26	14.43	16.72
1953	14.68	14.54	14.67	17.75	14.76	17.07
1954	15.93	14.16	15.91	17.19	13.46	16.98
1955	16.30	12.94	16.23	16.80	12.88	16.28
1956	17.70	14.15	17.58	18.39	14.11	17.64

[1] Beginning in 1954, figures based on market values and therefore not comparable with values shown for preceding years.

TABLE 37.—Average receipts per net ton of coke sold (commercial sales) in the United States in 1956, by States

State	Oven coke				Beehive coke			
	To blast-furnace plants	To foundries	To other industrial plants [1]	For residential heating	To blast-furnace plants	To foundries	To other industrial plants [1]	For residential heating
Alabama	[2]	$25.32	$13.66	$12.47				
California, Colorado, Texas, and Utah		[2]	19.62	18.17			[2]	
Connecticut, Massachusetts, New Jersey, and New York	$16.66	25.94	16.57	17.27				
Illinois	[2]	[2]	10.61	15.90				
Indiana	[2]	[2]	14.93	12.62				
Kentucky, Missouri, and Tennessee	13.65	29.62	15.99	[2]	[2]	[2]		
Michigan, Minnesota, and Wisconsin	17.79	26.92	14.58	16.40				
Ohio	15.54	26.29	12.31	13.17				
Pennsylvania	15.61	26.72	12.16	14.46	$13.92	$16.32	$11.31	$11.96
Virginia					15.83	[2]	[2]	14.09
West Virginia	[2]	[2]	9.81	[2]	[2]	17.28	14.76	
Undistributed	16.95	26.37		15.49	13.68	16.91	17.41	
United States average, 1956	15.70	26.50	14.35	16.30	14.02	16.58	14.31	12.41
At merchant plants	15.65	26.52	16.93	16.56				
At furnace plants	15.90	26.37	11.34	11.85				
United States average, 1955	14.33	23.75	12.97	15.10	12.57	15.05	13.62	10.75

[1] Includes coke sold to water-gas plants.
[2] Included with "Undistributed" to avoid disclosing individual company figures.

TABLE 38.—Average monthly prices per net ton of furnace and foundry beehive coke and foundry oven coke in the United States in 1956 [1]

	January	February	March	April	May	June
Beehive coke, at ovens:						
Connellsville furnace	$13.75–14.50	$13.75–14.50	$13.75–14.50	$13.75–14.50	$13.75–14.50	$13.75–14.50
Connellsville foundry	16.00–17.00	16.00–17.00	16.00–17.00	16.00–17.00	16.00–17.00	16.00–17.00
Oven foundry coke, at ovens:						
Birmingham	25.65	25.65	25.65	25.65	25.65	25.65
Detroit	27.50	27.50	27.50	27.50	27.50	27.50
Erie	27.50	27.50	27.50	27.50	27.50	27.50
Everett [2]	28.55	28.55	28.55	28.55	28.55	28.55
Indianapolis	26.75	26.75	26.75	26.75	26.75	26.75
Kearny	26.75	26.75	26.75	26.75	26.75	26.75
Lone Star	19.50	19.50	19.50	19.50	19.50	19.50
Milwaukee	27.50	27.50	27.50	27.50	27.50	27.50
Painesville	27.50	27.50	27.50	27.50	27.50	27.50
Philadelphia	26.50	26.50	26.50	26.50	26.50	26.50
St. Paul	26.50	26.50	26.50	26.50	26.50	26.50
Swedeland	26.50	26.50	26.50	26.50	26.50	26.50
Terre Haute	26.75	26.75	26.75	26.75	26.75	26.75

TABLE 38.—Average monthly prices per net ton of furnace and foundry beehive coke and foundry oven coke in the United States in 1956[1]—Continued

	July	August	September	October	November	December
Beehive coke, at ovens:						
Connellsville furnace	$13.75–14.50	$14.25–14.75	$14.25–14.75	$14.25–14.75	$14.50–15.50	$14.50–15.50
Connellsville foundry	16.00–17.00	17.00–18.00	17.00–18.00	17.00–18.00	17.50–18.50	17.50–18.50
Oven foundry coke, at ovens:						
Birmingham	25.65	27.60	27.60	27.60	27.60	27.60
Detroit	27.50	27.50	29.50	29.50	29.50	29.50
Erie	27.50	27.50	27.50	27.50	29.50	29.50
Everett [2]	28.55	30.55	30.55	30.55	30.55	30.55
Indianapolis	26.75	28.75	28.75	28.75	28.75	28.75
Kearny	26.75	28.75	28.75	28.75	28.75	28.75
Lone Star	19.50	19.50	19.50	25.50	25.50	25.50
Milwaukee	27.50	29.50	29.50	29.50	29.50	29.50
Painesville	27.50	29.50	29.50	29.50	29.50	29.50
Philadelphia	26.50	28.50	28.50	28.50	28.50	28.50
St. Paul	26.50	28.50	28.50	28.50	28.50	28.50
Swedeland	26.50	28.50	28.50	28.50	28.50	28.50
Terre Haute	26.75	26.75	28.75	28.75	28.75	28.75

[1] Weekly quotations by Steel Magazine.
[2] New England delivered or within $4.55 freight zone from works.

FOREIGN TRADE [1]

Imports.—Coke imports were small compared with production and consumption in the United States and were equivalent to approxi-

TABLE 39.—Coke imported for consumption in the United States, 1954–56, by countries and customs districts

[Bureau of the Census]

	1954		1955		1956	
	Net tons	Value	Net tons	Value	Net tons	Value
COUNTRY						
North America: Canada	114,635	$1,229,671	125,955	$1,393,530	129,952	$1,450,273
Europe:						
Germany, West	1,102	26,911	387	11,720	1,003	20,403
United Kingdom	44	1,872				
Total	1,146	28,783	387	11,720	1,003	20,403
Grand total	115,781	[1] 1,258,454	126,342	[1] 1,405,250	130,955	[1] 1,470,676
CUSTOMS DISTRICT						
Buffalo	720	5,780	2,513	25,290	12,132	149,776
Chicago					29	345
Connecticut			33	393		
Dakota	4,045	49,272	7,177	56,985	4,319	44,287
Duluth and Superior					43	383
Hawaii			387	11,720	193	9,384
Laredo			75	1,096		
Maine and New Hampshire	237	3,612	2,188	11,886	6,787	36,404
Michigan	12,000	103,417	32,474	362,451	32,597	293,399
Montana and Idaho	95,148	1,044,029	79,846	924,773	71,155	898,907
New York	44	1,872				
Puerto Rico	1,102	26,911				
Vermont	758	14,362	161	2,637	88	1,940
Washington	1,727	9,199	1,488	8,019	3,612	35,851
Total	115,781	[1] 1,258,454	126,342	[1] 1,405,250	130,955	[1] 1,470,676

[1] Owing to changes in tabulating procedures by the Bureau of the Census data known to be not comparable with earlier years.

[1] Figures on imports and exports compiled by Mae B. Price and Elsie D. Page, Division of Foreign Activities, Bureau of Mines, from records of the Bureau of the Census.

TABLE 40.—Coke exported from the United States, 1954–56, by countries and customs districts

	1954		1955		1956	
	Net tons	Value	Net tons	Value	Net tons	Value
COUNTRY						
North America:						
Canada	264,019	$4,574,437	361,114	$5,749,270	465,558	$7,605,280
Mexico	18,746	284,724	18,806	266,543	9,924	203,919
Panama	85	6,057	25	1,803	96	6,597
West Indies:						
Cuba	23,246	348,854	21,014	393,602	33,353	647,091
Trinidad and Tobago			229	5,535	60	1,300
Other West Indies			62	3,538	50	9,418
Other North America	187	6,243	207	7,434	211	13,995
Total	306,283	5,220,315	401,457	6,427,725	509,252	8,487,600
South America:						
Argentina	3,198	54,614	21,141	350,187	35,817	745,738
Bolivia	236	8,671	199	8,086	1,250	46,584
Brazil	21	1,992	187	4,890	74	13,472
Chile	175	6,063	791	21,053	819	27,015
Ecuador	120	9,252	164	11,548	162	8,850
Peru			50	1,725	163	6,576
Uruguay	205	5,006	234	5,483		
Venezuela	126	6,008	147	8,684	249	11,802
Other South America	24	2,315	12	1,147		
Total	4,105	93,921	22,925	412,803	38,534	860,037
Europe:						
Belgium-Luxembourg					2,236	47,904
Denmark			17,258	274,629	2,572	47,546
Germany, West					8,091	160,609
Greece	2,246	35,937	5,539	84,711		
Norway					5,002	105,027
Spain	35,071	455,134	32,336	352,931		
Sweden					31,265	601,048
Total	37,317	491,071	55,133	712,271	49,166	962,134
Asia:						
Israel			1,130	19,334	250	4,500
Japan					1,026	10,901
Pakistan			7,390	110,846		
Philippines	200	2,316	100	4,750	893	28,500
Total	200	2,316	8,620	134,930	2,169	43,901
Oceania:						
French Pacific Islands	39,670	494,837	42,370	550,350	56,596	1,114,592
Grand total	387,575	6,302,460	530,505	8,238,079	655,717	11,468,264
CUSTOMS DISTRICT						
Buffalo	83,976	1,551,539	68,491	1,229,846	46,926	824,574
Dakota	12,496	298,938	23,449	471,927	8,489	222,393
Duluth and Superior	4,523	102,982	6,650	178,322	4,586	98,167
Florida	1,910	60,755	2,397	75,131	2,505	83,389
Laredo	7,391	137,133	4,150	106,920	3,892	121,927
Los Angeles	2,466	17,263	7,723	58,467	4,739	34,388
Maryland	9	945	561	12,462	696	21,448
Massachusetts					60,880	1,200,148
Michigan	130,590	2,336,721	199,968	3,340,223	123,038	2,199,835
Mobile	2,031	50,769	1,808	44,808	11,135	282,392
New Orleans	1,044	47,018	827	41,988	12,788	296,475
New York	11,586	182,738	20,053	312,731	36,747	692,663
Ohio	17,317	91,096	36,416	263,930	46,637	296,972
Philadelphia	67,186	846,657	124,632	1,725,892	46,105	886,722
Rhode Island	21,029	256,211				
St. Lawrence	1,230	14,375	15,516	107,540	8,813	141,048
San Diego	848	25,559	777	19,693	448	15,598
San Francisco			100	4,750	1,271	28,474
Virginia	205	5,006	245	5,871	9,207	184,844
Washington	1,387	35,276	2,240	61,112	2,122	65,861
Other districts	20,351	241,479	14,502	176,466	224,693	3,770,946
Total	387,575	6,302,460	530,505	8,238,079	655,717	11,468,264

mately a half day's production in 1956. Nevertheless, they were important to certain areas where no other coke was available. All but a small percentage of the Nation's imports came from Canada. West Germany, the only other supplier, shipped 1,003 tons. Most of the Canadian shipments entered the United States through the Montana-Idaho customs district. Although little information is available, the purposes for which this coke was used were presumed to be nonferrous smelting and in the electrochemical industries of the northwest.

Exports.—The United States, a coke exporter for many years, has never exported more than 3 percent of the national production. In 1956 exports of coke including breeze increased 24 percent over 1955, but the total was less than 1 percent of the year's production. Canada received 71 percent of the total United States exports, a 29-percent increase over 1955 but 68 percent below the record for 1918. Exports to other North American countries (combined) were about the same as in 1955, although exports to individual countries varied.

Exports to South America rose 68 percent over 1955 because shipments to Argentina increased 69 percent. Shipments to Europe declined 11 percent, principally because Spain, which had received substantial tonnages of United States coke in 1954 and 1955, did not obtain any in 1956. Sweden for the first time since 1948 entered the United States market and obtained 31,265 tons valued at more than $600,000. Shipments to Asia, principally to Japan, were small. Next to Canada, the leading markets for American coke in recent years were the French Pacific Islands. Exports to these islands in 1956 were 34 percent above 1955 and 43 percent over 1954.

TECHNOLOGY

The continuing search in 1956 for more and better fuels and chemical raw materials through the carbonization of bituminous coal resulted in a number of significant developments in coke-plant technology. Government agencies, industrial concerns, and university groups in the United States and abroad conducted many scientific studies and technologic investigations in this field.

The Federal Bureau of Mines continued its research program on both high- and low-temperature carbonization. Studies and investigations continued on the low-temperature carbonization of low-rank coals, using an entrained and fluidized bed, including pilot-plant tests on these coals, and on tar produced from these tests and tar from the prototype commercial-scale carbonizer at Rockdale, Texas. Studies showed that extended storage of low-temperature tar caused oxidation, which resulted in the formation of pitch at the expense of the distillate fraction.

Other investigations and research included: (1) The influence of coking time and flue temperatures on coke, (2) the effects of variables (dry-bulk density, moisture content, and particle size) on the products of carbonization, and (3) the use of anthrafines and fluidized petroleum coke for producing metallurgical coke. Results of these studies have been published and are reported in the 1956 Bureau of Mines Annual Report of Research and Technologic Work on Coal and Related Investigations.

In 1956 the Koppers Co., Inc., began constructing a 1-ton-per-day pilot plant at Arroyo, W. Va., to explore high-boiling coal chemicals for future commercialization. Although coal tar contains several hundred different compounds, only a few are recovered on a commercial basis. The new plant was estimated to cost $1.5 million and would begin producing in 1957. Most of the pilot work and studies would be devoted to the coal chemicals boiling above 250° C.

The Illinois Geological Survey pilot-plant study of the relative quantities of foundry-size coke that could be produced from a coal mixture containing Illinois coal indicated that, by adding 5 to 10 percent of anthracite, coking time could be reduced 6 to 12 hours without decreasing the yield of large-size coke. Certain changes in the physical properties of the coke were concluded to be not detrimental to ultimate use of the product; the addition of anthracite fines was an effective way of increasing foundry-coke production.

A pilot-scale test oven was built at the research laboratory of the Eastern Gas and Fuel Associates, Everett, Mass., to determine the effect of coal blends and operating variables on coke quality. Comparison of pilot-scale-oven tests and plant-oven tests revealed that apparent specific gravities were consistently lower for the pilot samples. Although there were not enough comparison tests to establish firm correlations between plant-oven and pilot-scale oven tests, screen, shatter, and tumbler data revealed that the prevailing test procedures satisfactorily predicted the performance of full-scale coke ovens.

New equipment for determining the plasticity of coal included a new plastometer developed at the laboratory of The Citizens Gas and Coke Utility, Indianapolis, Ind. The Gieseler apparatus is now the most widely used in the United States. The new plastometer retained those features of the Gieseler that were desirable, but the methods of packing, test assembly, torque application, and heating were changed. This plastometer was developed in about 4 years and was reported to be faster, more convenient, and more precise than the Gieseler because it is less subject to bearing, frothing, and slippage troubles.

The British Coke Research Association (74 Grosvenor Street, London, England) published two pamphlets on carbonization and other subjects of interest to the coke industry. These publications contained extensive bibliographies and were issued in July and December 1956. Industrial and Engineering Chemistry magazine publishes an excellent summary on coal and shale pyrolysis throughout the world each year in the September issue. The ninth annual review for December 1954 to May 1956, in the September 1956 issue, covered studies and investigations on the following: (1) Mechanisms, kinetics, and thermochemistry, (2) raw-material properties, (3) high- and low-temperature carbonization, (4) oven operations, (5) coke and coal chemicals, and (6) analysis and testing.

WORLD REVIEW[3]

Estimated world production of coke in 1956 was 330.2 million net tons (excluding breeze) and consisted of 85 percent oven and beehive (metallurgical) coke and 15 percent gashouse, low-, and medium-

[3] Figures on world production compiled by Pearl J. Thompson, Division of Foreign Activities, Bureau of Mines.

TABLE 41.—World production of oven and beehive coke (excluding breeze), 1952–56, by countries, in thousand net tons [1]

Country	1952	1953	1954	1955	1956
North America:					
Canada	3,593	3,809	3,082	3,714	[2] 3,850
Mexico	510	429	440	498	633
United States	68,254	78,839	59,662	75,302	74,454
Total	72,357	83,077	63,184	79,514	78,937
South America:					
Brazil	331	366	504	530	[2] 550
Chile	256	268	292	260	[2] 260
Colombia [2]	22	22	22	275	275
Peru [3]	6	6	6	12	10
Total	615	662	824	1,077	1,095
Europe:					
Austria	1,356	1,342	1,490	1,598	1,896
Belgium	7,076	6,553	6,776	7,275	8,014
Bulgaria [2]	17	23	28	28	28
Czechoslovakia	6,151	6,518	6,600	6,834	8,047
France	10,494	9,830	10,526	11,822	13,502
Germany:					
East	285	275	275	[2] 275	[2] 275
West [3]	41,042	41,641	38,494	44,666	47,879
Italy	2,723	2,689	2,889	3,251	3,761
Netherlands	3,558	3,532	3,699	4,300	4,669
Poland	[4] 8,111	[4] 8,678	[4] 9,373	[4] 11,063	10,490
Rumania [2]	290	345	340	550	550
Saar	4,285	3,956	4,041	4,342	4,636
Spain	1,311	1,301	1,362	1,601	1,759
Sweden	73	111	123	137	146
U. S. S. R.	37,100	40,700	44,400	48,100	[2] 50,500
United Kingdom	19,143	19,579	19,996	20,276	21,534
Yugoslavia	17	326	445	806	1,017
Total	143,000	147,400	150,900	166,900	178,700
Asia:					
China	3,153	[2] 3,900	[2] 4,400	[2] 5,000	[2] 6,100
India	2,289	2,252	2,643	2,908	2,794
Iran [5]	4	3	7	8	3
Japan	4,402	5,258	4,840	5,198	6,111
Korea:					
North [2]	300	350	400	440	440
Republic of	1	1	[6] 1	(7)	(7)
Taiwan (Formosa)	142	165	136	146	162
Turkey	441	605	561	603	554
Total	10,700	12,500	13,000	14,300	16,200
Africa:					
Rhodesia and Nyasaland, Federation of: Southern Rhodesia	134	150	160	209	[2] 265
Union of South Africa	1,491	1,593	1,526	1,544	1,626
Total	1,625	1,743	1,686	1,753	1,891
Oceania:					
Australia	1,940	2,277	2,295	2,240	2,500
New Caledonia [2]	77	77	77	80	80
New Zealand	8	7	7	7	[2] 7
Total	2,025	2,361	2,379	2,327	2,587
World total [2]	230,300	247,700	232,000	265,900	279,400

[1] Includes revisions of data published previously. Data do not add to totals shown, owing to rounding.
[2] Estimated.
[3] Includes electrode coke.
[4] Includes gashouse and low-temperature coke.
[5] Year ended Mar. 20 of year following that stated.
[6] Includes gashouse coke.
[7] Negligible.

temperature coke. As oven- and beehive-coke production is a good barometer of industrial activity because of its widespread industrial applications, the steady increase in output throughout the world in the past several years indicated the progress in industrialization in various countries. The most significant increase in tonnage in 1956, when compared with 1955, occurred in West Germany, where production increased 7 percent. Sizable gains were also made in metallurgical-coke production in the U. S. S. R., France, United Kingdom, Czechoslovakia, China, and Japan. Although the United States produced far more coke than any other country, output in 1956 declined 1 percent from 1955 because of a 35-day steel strike during the year.

Europe produced 64 percent of the world total of oven and beehive coke and 84 percent of the gashouse and other types. Production in the Western Hemisphere was less than half the European production, as countries other than the United States did not even match the small production in Asia. Tables 41 and 42 contain the latest statistics available on production of coke in individual countries.

TABLE 42.—World production of gashouse, 10w-, and medium-temperature coke (excluding breeze), 1952–56, by countries, in thousand net tons [1]

Country [2]	1952	1953	1954	1955	1956
North America:					
Canada	175	158	132	71	61
United States, retort, low-, and medium-temperature	45	237	256	(3)	182
Total [4]	330	500	500	310	355
South America:					
Argentina [4]	55	55	55	55	60
Chile	125	121	118	119	[4] 120
Peru, medium-temperature	22	[4] 22	[4] 22	22	[4] 15
Uruguay	40	40	39	34	33
Total	240	240	235	230	230
Europe:					
Australia	500	451	504	478	465
Belgium	23	22	20	10	4
Czechoslovakia: [4]					
Gashouse	760	810	815	840	855
Lignite	930	1,000	1,000	1,000	1,000
Denmark	460	414	459	445	435
Finland	127	131	117	96	107
France:					
Gashouse	1,642	1,450	1,264	1,064	970
Low-temperature	308	295	315	344	338
Germany:					
East: [4]					
Gashouse	1,900	2,100	2,300	2,500	2,600
Lignite	6,300	6,800	6,900	7,000	7,100
West:					
Gashouse	4,633	4,443	4,725	5,581	6,336
Lignite	774	798	764	685	645
Greece	33	34	[4] 34	[4] 34	[4] 33
Hungary [4]	130	130	130	140	130
Ireland (Eire)	197	195	214	212	213
Italy	1,227	1,187	1,160	1,095	1,091
Luxembourg	35	34	36	40	40
Netherlands	1,023	908	947	958	833
Norway [5]	72	71	68	64	[4] 65
Poland: [4]					
Gashouse	990	990	1,020	1,050	1,070
Low-temperature	105	105	110	110	110
Portugal	31	37	39	42	41
Saar, low-temperature	104	91	100	128	140
Spain	245	250	270	276	288
Sweden	740	680	751	771	801
Switzerland	[4] 330	330	330	330	330
United Kingdom:					
Great Britain	14,036	13,781	13,811	14,229	14,187
Northern Ireland	191	191	193	183	179
Yugoslavia	29	28	26	26	25
Total [4]	40,100	40,000	40,700	42,000	42,900

See footnotes at end of table.

TABLE 42.—World production of gashouse, low-, and medium-temperature coke (excluding breeze), 1952–56, by countries, in thousand net tons [1]—Continued

Country [2]	1952	1953	1954	1955	1956
Asia:					
Ceylon [4]	17	17	13	13	13
Hong Kong	[4] 17	[4] 21	[4] 21	21	19
India:					
Gashouse	99	110	101	103	[4] 105
Low-temperature	1,617	1,857	1,735	2,072	2,069
Japan:					
Gashouse	2,076	2,361	2,429	2,616	2,980
Low-temperature	[4] 130	[4] 130	[4] 85	76	[4] 75
Korea, Republic of	1	1	1	1	----------
Malaya [4]	17	17	19	19	19
Taiwan (Formosa):					
Gashouse	[4] 1	4	6	13	13
Low-temperature	37	49	44	46	[4] 50
Turkey:					
Gashouse	66	69	122	181	114
Low-temperature	[4] 45	[4] 45	[4] 35	[4] 35	90
Total [4]	4,300	4,800	4,800	5,400	5,700
Africa:					
Algeria	107	100	104	93	[4] 90
Egypt	[4] 30	23	24	25	[4] 25
Tunisia	14	17	12	1	[4] 1
Union of South Africa	[4] 85	104	99	88	94
Total	236	244	239	207	210
Oceania:					
Australia [6]	1,345	1,199	940	1,232	[4] 1,305
New Zealand	[4] 65	[4] 65	84	78	[4] 85
Total	1,410	1,264	1,024	1,310	1,390
World total [4]	46,600	47,000	47,500	49,500	50,800

[1] Gashouse coke unless otherwise specified. Includes revisions of data published previously. Data do not add to totals shown owing to rounding.
[2] Production data for China, Mexico, Rumania, and U. S. S. R. are not available; estimates included in total.
[3] Production included in total; Bureau of Mines not at liberty to publish separately.
[4] Estimated.
[5] Includes breeze.
[6] Year ended June 30 of year stated.

COAL-CHEMICAL MATERIALS

GENERAL SUMMARY

Production of the basic coal-chemical materials followed closely the reduced output of oven coke in 1956; ammonia, tar, light oil, and coke-oven gas decreased 7, 2, 2, and 3 percent, respectively. The production of coal chemicals is governed largely by activity in the iron and steel industry, as more than 86 percent of oven-coke capacity was owned by iron and steel producers. Future output of these materials from high-temperature carbonization can be expected to depend more on steel production than in the past, as virtually all new capacity under construction and planned for the next few years will be built by steel companies to support anticipated expansion of blast-furnace capacity. Although the main objective of the steel companies is to produce the highest grade metallurgical coke possible, coal chemicals have developed as an important contributor in the overall sales picture of an integrated steel operation. Optimum use of coal-chemical materials is more important to the nonfurnace or merchant oven-coke plants since economical operations depend on a balanced market.

The value of coal-chemical materials, including gas used and sold, represented 22 percent of the value of all products. Table 43 shows the values assigned to the various groups of coal-chemical materials. Significant shifts in the gross values assigned to coke, gas, and chemical materials from 1930 to 1956 are presented in figure 3. As indicated, the most significant development in values credited to the coal-chemical materials in the past 25 years has been the steady decline in value of surplus coke-oven gas. In 1930 surplus gas furnished nearly 22 percent of the value of all products. At that time, however, 37 percent of all surplus gas was sold for distribution through city mains; coke-oven gas for this purpose always provided greater financial returns than gas sold or used for industrial purposes. In 1956 only 10 percent of the surplus gas was sold for city distribution, and the small percentage held down the surplus-gas credit. The increase in prices on benzene and crude coal tar since 1950 enabled the chemical materials to retain the same proportion of the total value of all products as they had in the midthirties. The 1956 proportion, however, was far less than the 20 percent contributed in 1930, when prices of ammonia compounds were much higher, comparatively, than in 1956.

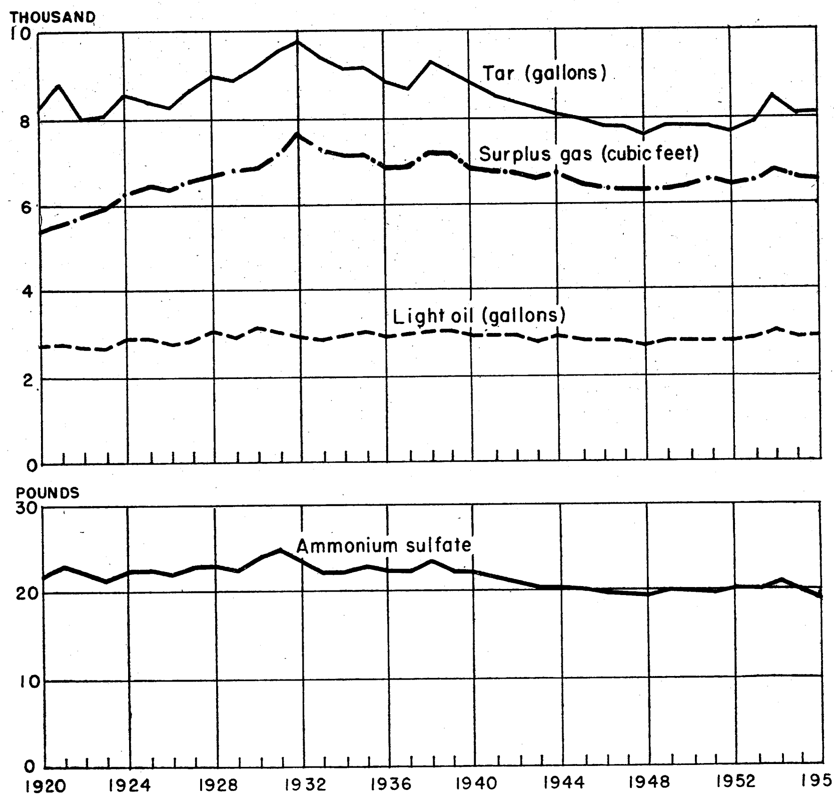

FIGURE 2.—Average yield of principal coal-chemical materials per net ton of coal carbonized in coke ovens, 1920–56. Yields of light oil and ammonium sulfate equivalent represent the average for plants recovering these products.

TABLE 43.—Coal-chemical materials (exclusive of breeze), produced at coke-oven installations in the United States in 1956 [1]

Product	Produced	Sold			On hand Dec. 31
		Quantity	Value		
			Total	Average	
Tar, crude .... gallons..	832, 827, 042	[2] 416, 286, 387	$50, 128, 897	$0. 120	33, 012, 294
Tar derivatives:					
Creosote oil:					
Distillate as such (100 percent creosote) .... gallons..	23, 984, 066	25, 116, 776	4, 976, 332	. 198	923, 592
Creosote-coal tar solution (100 percent solution basis) .... gallons..	4, 445, 213	4, 396, 725	793, 907	. 181	173, 790
Creosote content of solution (100 percent creosote basis) .... gallons..	3, 711, 153	3, 637, 449	....	....	....
Crude chemical oil .... do....	26, 311, 145	26, 135, 677	6, 923, 790	. 265	1, 142, 634
Phenol .... pounds..	10, 885, 176	11, 655, 269	1, 708, 187	. 147	234, 448
Pitch of tar:					
Soft [3] .... net tons..	634, 190	31, 880	995, 267	31. 219	16, 473
Hard [4] .... do....	391, 319	57, 084	1, 500, 271	26. 282	2, 010
Other coal-tar derivatives [5]	....	....	3, 146, 309	....	....
Ammonia:					
Sulfate [6] .... pounds..	1, 765, 400, 191	1, 799, 497, 890	28, 447, 770	. 016	369, 031, 678
Liquor (NH_3 content) .... do....	35, 361, 509	32, 587, 478	1, 205, 393	. 037	3, 014, 480
Diammonium phosphate .... do....	47, 036, 678	47, 145, 260	2, 549, 294	. 054	12, 842, 084
Total	....	....	32, 202, 457	....	....
Sulfate equivalent of all forms ... pounds..	1, 949, 604, 164	1, 973, 049, 987	....	....	....
NH_3 equivalent of all forms .... do....	502, 583, 125	508, 626, 054	....	....	....
Gas:					
Used under boilers, etc ..... M cubic feet..	[7] 1, 055, 328, 682	63, 372, 938	10, 325, 566	. 163	....
Used in steel or allied plants .... do....		497, 279, 254	108, 006, 604	. 217	....
Distributed through city mains .... do....		64, 302, 983	26, 284, 050	. 409	....
Sold for industrial use .... do....		38, 640, 465	6, 865, 430	. 178	....
Total	1, 055, 328, 682	663, 595, 640	151, 481, 650	. 228	....
Crude light oil .... gallons..	[8] 290, 972, 209	14, 628, 164	3, 176, 711	. 217	6, 206, 887
Light-oil derivatives:					
Benzene:					
Specification grades (1°, 2°, 90 percent, and other industrial grades) . gallons.	174, 426, 023	173, 420, 085	59, 547, 670	. 343	6, 658, 912
Motor grade .... do....	(9)	(9)	(9)	....	(9)
Toluene (all grades) .... do....	37, 238, 064	35, 583, 636	10, 161, 869	. 286	3, 575, 549
Xylene (all grades) .... do....	10, 339, 817	10, 237, 291	3, 245, 357	. 317	746, 905
Solvent naphtha (crude and refined) gallons..	5, 824, 619	5, 703, 537	1, 437, 656	. 252	372, 716
Other light-oil products .... do....	6, 400, 339	4, 872, 306	661, 824	. 136	310, 544
Total	234, 228, 862	229, 816, 855	75, 054, 376	. 327	11, 664, 626
Intermediate light oil .... do....	3, 007, 973	3, 046, 736	764, 465	. 251	194, 279
Naphthalene (crude):					
Solidifying under 74° C .... pounds..	34, 472, 210	32, 428, 387	1, 236, 402	. 038	2, 521, 888
From 74° to 79° C .... do....	142, 786, 672	103, 500, 476	7, 035, 576	. 068	31, 140, 920
Sodium phenolate .... gallons..	3, 691, 506	3, 506, 022	425, 256	. 121	382, 586
Sulfur .... pounds..	6, 395, 070	6, 270, 170	79, 055	. 013	801, 590
Value of all coal-chemical materials sold	....	....	341, 628, 908	....	....

[1] Includes products of tar distillation conducted by coke-oven operators under same corporate name.
[2] Includes 38,898,052 gallons sold to affiliated companies for refining.
[3] Water-softening point, less than 110° F. Includes some medium pitch-of-tar reported by 2 producers.
[4] Water-softening point, over 160° F.
[5] Cresols, cresylic acid, pitch coke, pyridine, red oil, road tar, tar paint, and refined tar.
[6] Includes ammonium thiocyanate.
[7] Includes gas used for heating ovens and gas wasted.
[8] 276,765,214 gallons refined by coke-oven operators to make derived products shown.
[9] Included with "Other light-oil products" to avoid disclosing individual company figures.

The value credited to coal-chemical materials, including surplus gas, amounted to 40 percent of the cost of the coal in 1956, compared with 37 percent for 1947–49. This increase resulted from the gains by light-oil derivatives and tar and its products as financial returns from ammonia and surplus gas declined (table 45) between 1947–49 and 1956. The average value of coal-chemical materials used and sold increased 32 percent, coke and breeze 47 percent, and coal, 20 percent.

The total dollar value of coal-chemical materials sold, including surplus gas used by the producing companies, totaled $341,628,908, a decline of almost $7 million (2 percent) from the record total of 1955.

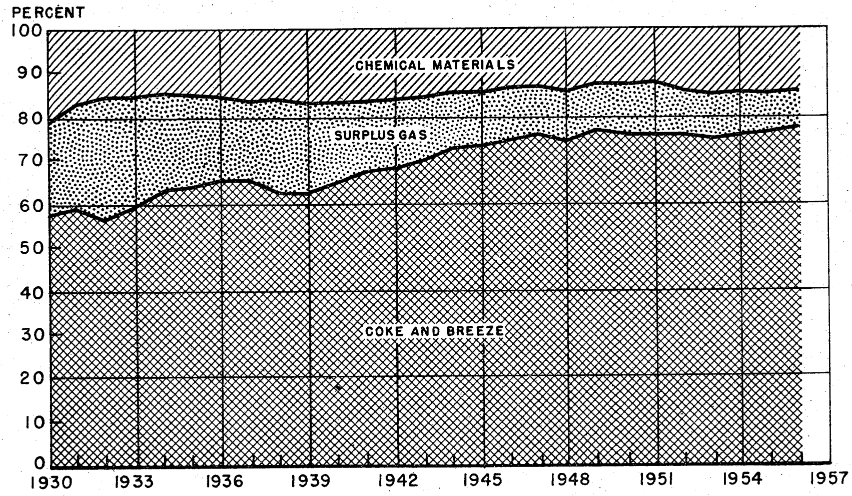

FIGURE 3.—Percentage of total value of coke-oven products from slot-type ovens supplied by coke and breeze, surplus gas, and chemical materials, 1930–56.

TABLE 44.—Average value of coal-chemical materials used and sold and of coke and breeze produced per ton of coal carbonized in the United States, 1947–49 (average) and 1952–56

Product	1947–49 (average)	1952	1953	1954	1955	1956
Ammonia and its compounds	$0.356	$0.391	$0.375	$0.422	$0.352	$0.315
Light oil and its derivatives (including naphthalene)	.451	[1] .810	[1] .877	[1] .877	[1] .845	.854
Surplus gas sold or used	1.291	1.353	1.408	1.519	1.489	1.481
Tar and its derivatives:						
Sold	.501	[1] .601	[1] .615	[1] .626	[1] .626	.683
Tar burned by producers [2]	.228	.271	.278	.372	.382	.408
Other products	.020	[1] .027	[1] .027	[1] .009	[1] .010	.008
Total	2.847	3.453	3.580	3.825	3.704	3.749
Coke produced	8.488	10.178	10.296	11.115	11.439	12.462
Breeze produced	.191	.204	.216	.236	.237	.256
Grand total	11.526	13.835	14.092	15.176	15.380	16.467

[1] Revised figure.
[2] Includes pitch-of-tar.

TABLE 45.—Percentage of value of coal recovered by coal chemical materials in the United States, 1947–49 (average) and 1952–56

	1947–49 (average)	1952	1953	1954	1955	1956
Product:						
Ammonia and its compounds	4.6	4.2	4.1	4.7	4.0	3.4
Light oil and its derivatives (including naphthalene)	5.8	8.8	9.5	9.7	[1] 9.6	9.1
Surplus gas sold or used	16.6	14.7	15.2	16.9	[1] 16.8	15.8
Tar and its derivatives sold or used	9.3	[1] 9.4	[1] 9.7	[1] 11.1	[1] 11.4	11.7
Other products	.2	[1] .3	[1] .3	[1] .1	[1] .1	.1
Total	36.5	37.4	38.8	42.5	41.9	40.1
Value of coal per net ton	$7.79	$9.23	$9.24	$9.00	$8.84	$9.35

[1] Revised figure.

TABLE 46.—Coal equivalent of the thermal materials, except coke, produced at oven-coke plants in the United States, 1913, 1918, 1929, 1939, 1947–49 (average), and 1952–56

Year	Materials produced				Estimated equivalent in heating value [1] (billion B. t. u.)					Coal equivalent (thousand net tons)
	Coke breeze (thousand net tons)	Surplus gas (billion cubic feet)	Tar (thousand gallons)	Light oil (thousand gallons)	Coke breeze	Surplus gas	Tar	Light oil	Total	
1913	735	64	115,145	3,000	14,700	35,200	17,272	390	67,562	2,600
1918	1,999	158	263,299	87,562	39,980	86,900	39,495	11,383	177,758	6,785
1929	4,853	508	680,864	200,594	97,060	279,400	102,130	26,077	504,667	19,262
1939	3,354	434	554,406	170,963	67,080	238,700	83,161	22,225	411,166	15,693
1947–49 (average)	5,390	582	715,779	246,607	107,800	320,100	107,367	32,059	567,326	21,654
1952	4,639	576	703,890	249,284	92,780	316,800	105,584	32,407	547,571	20,900
1953	5,253	673	828,729	295,725	105,060	370,150	124,309	38,444	637,963	24,350
1954	3,931	558	715,840	246,019	78,620	306,900	107,376	31,982	524,878	20,034
1955	4,862	689	852,923	297,498	97,240	378,950	127,938	38,675	642,803	24,534
1956	4,772	664	832,827	290,972	95,436	365,200	124,924	37,826	623,386	23,793

[1] Breeze, 10,000 B. t. u. per pound; gas, 550 B. t. u. per cubic foot; tar, 150,000 B. t. u. per gallon; and light oil, 130,000 B. t. u. per gallon.

COKE-OVEN GAS

Production of coke-oven gas decreased 3 percent from 1955. Thirty-five percent of the total was used to heat the ovens, 63 percent was used or sold by the producers (surplus gas), and 2 percent was either wasted or unaccounted for. Surplus gas was distributed as follows: 9 percent was used by producers under boilers or other coke-plant equipment, 75 percent was used in steel or allied plants, 10 percent was sold for distribution through city mains (residential and commercial heating and cooking), and 6 percent was sold for industrial use.

Table 48 contains detailed statistics on the disposal of surplus gas by furnace and merchant plants. Furnace plants use tremendous quantities of coke-oven gas in metallurgical furnaces. In 1956 furnace plants used 93 percent of their surplus gas under boilers and in steel and allied plants and sold the remaining 7 percent for (1) residential heating and (2) industrial purposes. Merchant plants, however, cannot use as much gas as furnace plants, and the group sold 73 percent of its surplus in 1956. As merchant plants sold most of their gas for residential heating, the average value per M cubic feet of surplus gas at merchant plants was $0.339 as compared with $0.213 per M cubic feet for furnace plants. The average value of all surplus gas, however, varied very slightly, rising to $0.228 from the $0.227 per M cubic feet in 1955.

TABLE 47.—Production and disposal of coke-oven gas in the United States in 1956, by States, in thousand cubic feet

State	Produced		Used in heating ovens	Surplus sold or used			Wasted
	Total	Per ton of coal coked		Quantity	Value: Total	Value: Average	
Alabama	78,334,048	9.94	37,003,625	38,674,118	$4,456,539	$0.115	2,656,305
California	18,532,302	10.98	1,454,536	16,817,795	(1)	(1)	259,971
Colorado	13,156,691	11.63	6,427,455	6,689,896	(1)	(1)	39,340
Illinois	40,022,162	10.16	14,404,250	23,902,067	4,645,081	.194	1,715,845
Indiana	123,499,244	9.99	42,034,125	80,365,411	16,673,111	.207	1,099,708
Maryland	45,626,300	10.87	10,383,085	34,885,058	(1)	(1)	358,157
Massachusetts	8,534,127	10.01	1,021,791	7,512,336	(1)	(1)	----------
Michigan	46,607,136	9.82	7,288,035	37,940,494	9,760,333	.257	1,378,607
Minnesota	15,297,125	10.91	6,246,816	8,600,326	2,296,853	.267	449,983
New Jersey	17,068,946	10.51	4,084,321	12,984,625	(1)	(1)	----------
New York	55,751,966	10.27	17,198,489	38,193,308	11,114,321	.291	360,169
Ohio	170,641,347	10.17	68,732,031	95,343,223	21,458,754	.225	6,566,093
Pennsylvania	289,308,409	10.36	111,378,535	175,383,034	38,217,251	.218	2,546,840
Tennessee	2,321,633	8.98	936,534	1,279,464	(1)	(1)	105,635
Texas	9,089,353	10.40	3,737,642	3,913,349	(1)	(1)	1,438,362
Utah	24,073,219	11.46	6,039,574	16,543,443	(1)	(1)	1,490,202
West Virginia	67,332,640	11.23	19,764,144	46,857,354	8,785,913	.188	711,142
Connecticut, Kentucky, Missouri, and Wisconsin	30,132,034	9.82	12,238,828	17,710,339	5,571,968	.315	182,867
Undistributed	----------	-------	----------	----------	28,501,526	.283	----------
Total 1956	1,055,328,682	10.32	370,373,816	663,595,640	151,481,650	.228	21,359,226
At merchant plants	129,217,645	9.80	46,780,785	80,842,901	27,380,825	.339	1,593,959
At furnace plants	926,111,037	10.40	323,593,031	582,752,739	124,100,825	.213	19,765,267
Total 1955	1,083,624,595	10.33	373,592,239	689,347,940	156,139,766	.227	20,684,416

[1] Included with "Undistributed" to avoid disclosing individua lcompany figures.

TABLE 48.—Surplus coke-oven gas used by producers and sold in the United States in 1956, by States, in thousand cubic feet

State	Used by producers—					
	Under boilers			In steel or allied plants		
	Quantity	Value		Quantity	Value	
		Total	Average		Total	Average
Alabama	13,592,033	(1)	(1)	20,464,796	$2,391,621	$0.117
California				13,852,740	(1)	(1)
Colorado				6,689,896	(1)	(1)
Illinois	3,849,085	(1)	(1)	13,776,768	2,977,300	.216
Indiana	5,102,413	(1)	(1)	58,668,238	11,504,410	.196
Maryland				34,885,058	(1)	(1)
Massachusetts	243,346	(1)	(1)	248	(1)	(1)
Michigan	2,091,671	(1)	(1)	33,809,768	8,733,155	.258
Minnesota	2,556,105	$488,145	$0.191	2,588,641	(1)	(1)
New Jersey	60	(1)	(1)			
New York	3,492,015	(1)	(1)	26,493,423	(1)	(1)
Ohio	9,349,215	(1)	(1)	75,510,498	17,657,725	.234
Pennsylvania	12,859,073	2,009,601	.156	152,503,688	31,502,665	.207
Tennessee	426,237	(1)	(1)			
Texas	3,592,860	(1)	(1)	293,632	(1)	(1)
Utah	15,529	(1)	(1)	16,527,914	(1)	(1)
West Virginia	3,770,386	(1)	(1)	41,213,946	8,206,312	.199
Connecticut, Kentucky, Missouri, and Wisconsin	2,432,910	367,977	.151			
Undistributed		7,459,843	.164		25,033,416	.247
Total 1956	63,372,938	10,325,566	.163	497,279,254	108,006,604	.217
At merchant plants	13,599,557	2,190,190	.161	7,847,838	1,785,117	.227
At furnace plants	49,773,381	8,135,376	.163	489,431,416	106,221,487	.217
Total 1955	57,216,555	9,920,113	.173	[2]523,010,328	[2]111,452,781	[2].213

State	Sold					
	Distributed through city mains			For industrial purposes		
	Quantity	Value		Quantity	Value	
		Total	Average		Total	Average
Alabama	1,315,768	(1)	(1)	3,301,521	$369,647	$0.112
California				2,965,055	(1)	(1)
Colorado						
Illinois	5,589,084	$985,470	$0.176	687,130	(1)	(1)
Indiana	3,785,936	1,468,860	.388	12,808,824	(1)	(1)
Maryland						
Massachusetts	7,268,742	(1)	(1)			
Michigan				2,039,055	(1)	(1)
Minnesota	2,567,041	(1)	(1)	888,539	(1)	(1)
New Jersey	12,984,565	(1)	(1)			
New York	8,015,690	(1)	(1)	192,180	(1)	(1)
Ohio	5,780,657	(1)	(1)	4,702,853	857,175	.182
Pennsylvania	10,020,273	4,704,985	.470			
Tennessee	853,227	(1)	(1)			
Texas				26,857	(1)	(1)
Utah						
West Virginia				1,873,022	(1)	(1)
Connecticut, Kentucky, Missouri, and Wisconsin	6,122,000	(1)	(1)	9,155,429	1,347,131	.147
Undistributed		19,124,735	.426		4,291,477	.200
Total 1956	64,302,983	26,284,050	.409	38,640,465	6,865,430	.178
At merchant plants	39,913,949	20,215,765	.506	19,481,557	3,189,753	.164
At furnace plants	24,389,034	6,068,285	.249	19,158,908	3,675,677	.192
Total 1955	70,461,742	27,757,664	.394	[2]38,659,315	[2]7,009,208	[2].181

[1] Included with "Undistributed" to avoid disclosing individual company figures.

[2] Revised figures.

TABLE 49.—Coke-oven gas and other gases used in heating coke ovens in the United States in 1956, by States, in thousand cubic feet [1]

State	Coke-oven gas	Producer gas	Blue-water gas	Blast-furnace gas	Natural gas	Other gases [2]	Total coke-oven-gas equivalent
Alabama	37,003,625				1,832		37,005,457
California	1,454,536			6,801,037	39,401		8,294,974
Colorado	6,427,455						6,427,455
Illinois	14,404,250			3,425,211	357,925		18,187,386
Indiana	42,034,125			14,212,470	1,674,933	11,878	57,933,406
Maryland	10,383,085			7,549,054			17,932,139
Massachusetts	1,021,791	1,023,318					2,045,109
Michigan	7,288,035			12,643,870			19,931,905
Minnesota	6,246,816	121,916					6,368,732
New Jersey	4,084,321	1,840,000			1,431,888		7,356,209
New York	17,198,489			7,922,275	453,847		25,574,611
Ohio	68,732,031			4,941,241			73,673,272
Pennsylvania	111,378,535	1,462,283		4,591,217	199,091	822	117,631,948
Tennessee	936,534						936,534
Texas	3,737,642						3,737,642
Utah	6,039,574			2,827,157			8,866,731
West Virginia	19,764,144			5,644,838		1,700,883	27,109,865
Connecticut, Kentucky, Missouri, and Wisconsin	12,238,828	1,227,849			810,850	3,145	14,280,672
Total 1956	370,373,816	5,675,366		70,558,370	4,969,767	1,716,728	453,294,047
At merchant plants	46,780,785	5,675,366			3,737,837	1,704,850	57,898,838
At furnace plants	323,593,031			70,558,370	1,231,930	11,878	395,395,209
Total 1955	373,592,239	7,831,317	9,920	75,010,298	5,414,468	1,868,364	463,726,606

[1] Adjusted to an equivalent of 550 B. t. u. per cubic foot.
[2] Butane, liquefied-petroleum, and spillage gases.

CRUDE COAL TAR AND DERIVATIVES

Production of tar in 1956 was only 2 percent less than the record output of 1955. Although the quantity of coal was considerably less than the maximum carbonized in 1953, tar yields were higher, contributing the high output. Tar yields are influenced by a number of factors, including oven temperatures. When high oven temperatures and rapid coking rates are maintained in the industry, tar yields decline, but when oven temperatures are reduced, yields increase. The result is shown graphically in figure 2. These methods supplied the high tar yield obtained during the depression years of the 1930's. Rapid coking rates during and following World War II caused tar yields to decrease below 8 gallons per ton of coal carbonized until 1954. The recession in coke production in 1954 caused the tar yield to increase to the highest quantity since 1941. Although tar yields dipped slightly in the 2 years after 1954, the 1956 yield was considerably higher than a decade ago.

Crude coke-oven tar has a high calorific content and may be used as fuel or processed into many tar products. The most notable change was the declining use of tar in its crude form as a fuel. In 1940 approximately 32 percent of our crude-tar production was burned, 23 percent was processed (distilled or topped) by the coke-oven operators, and 46 percent was sold to tar distillers for refining. In 1956 the proportion burned approximated only 17 percent, 34 percent was processed by coke-oven operators, and 50 percent was sold to tar distillers.

TABLE 50.—Coke-oven tar produced, used by producers, and sold in the United States in 1956, by States, in gallons

State	Produced		Used by producers		
	Total	Per ton of coal coked	For refining or topping [1]	Burned as fuel	Used otherwise
Alabama	59, 976, 670	7. 61	12, 739, 965	7, 298, 251	55, 897
California	15, 152, 484	8. 98			
Colorado	11, 989, 406	10. 60	6, 707, 597	5, 230, 706	47, 045
Illinois	26, 404, 076	6. 70	7, 771, 595		95, 200
Indiana	70, 604, 613	5. 71	42, 712, 920	478, 871	174, 472
Maryland	36, 237, 411	8. 63		32, 781, 442	
Massachusetts	6, 665, 412	7. 82			
Michigan	35, 393, 748	7. 46			
Minnesota	10, 059, 814	7. 18			3, 500
New Jersey	12, 007, 697	7. 39			
New York	42, 779, 852	7. 88	23, 591, 472		82, 363
Ohio	127, 709, 295	7. 61	3, 620, 957	17, 948, 889	253, 404
Pennsylvania	267, 950, 451	9. 59	169, 374, 164	58, 044, 081	619, 666
Tennessee	1, 934, 753	7. 49			
Texas	5, 324, 134	6. 09			66, 325
Utah	20, 745, 360	9. 87		16, 098, 456	
West Virginia	59, 880, 906	9. 99	18, 300, 989	544, 346	
Connecticut, Kentucky, Missouri, and Wisconsin	22, 010, 960	7. 18	985, 335		
Total 1956	832, 827, 042	8. 15	285, 804, 994	138, 425, 042	1, 397, 872
At merchant plants	94, 592, 557	7. 18	1, 881, 497		
At furnace plants	738, 234, 485	8. 29	283, 923, 497	138, 425, 042	1, 397, 872
Total 1955	852, 922, 817	8. 13	311, 674, 742	137, 062, 419	1, 544, 490

State	Sold for refining into tar products [2]			On hand Dec. 31
	Quantity	Value		
		Total	Average	
Alabama	39, 848, 728	$4, 694, 700	$0. 118	3, 087, 257
California	14, 967, 387	(3)	(3)	643, 550
Colorado	95, 868	(3)	(3)	333, 525
Illinois	20, 868, 847	2, 506, 487	. 120	1, 748, 466
Indiana	29, 688, 011	3, 532, 838	. 119	3, 300, 787
Maryland	4, 258, 607	(3)	(3)	2, 317, 065
Massachusetts	6, 650, 144	(3)	(3)	188, 952
Michigan	35, 537, 771	4, 162, 835	. 117	1, 987, 634
Minnesota	10, 185, 898	1, 100, 035	. 108	730, 646
New Jersey	11, 847, 571	(3)	(3)	667, 521
New York	19, 298, 431	2, 361, 229	. 122	1, 436, 314
Ohio	107, 859, 075	12, 912, 223	. 120	5, 017, 235
Pennsylvania	41, 872, 853	5, 077, 152	. 121	7, 650, 025
Tennessee	1, 925, 352	(3)	(3)	49, 601
Texas	5, 049, 841	(3)	(3)	410, 825
Utah	4, 420, 012	(3)	(3)	1, 406, 336
West Virginia	41, 052, 127	5, 305, 231	. 129	1, 343, 648
Connecticut, Kentucky, Missouri, and Wisconsin	20, 859, 864	2, 622, 031	. 129	692, 907
Undistributed		5, 854, 136	. 119	
Total 1956	416, 286, 387	50, 128, 897	. 120	33, 012, 294
At merchant plants	92, 918, 099	11, 221, 263	. 121	3, 411, 519
At furnace plants	323, 368, 288	38, 907, 634	. 120	29, 600, 775
Total 1955	398, 380, 071	45, 999, 007	. 115	37, 831, 031

[1] Includes 3,702,255 gallons also shown under "Sold for refining into tar products."
[2] Comprises 38,898,052 gallons valued at $4,684,074 sold to affiliated companies and 377,388,335 gallons valued at $45,444,823 sold to other purchasers.
[3] Included with "Undistributed" to avoid disclosing individual company figures.

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In distilling or topping tar the principal products obtained are creosote oil, tar-acid oil (crude chemical oil), naphthalene, and pitch. Creosote-oil production decreased 8 percent from 1955 and was 29 percent lower than in the early 1950's. Production of crude chemical oil (tar-acid oil) was slightly lower than in 1955 but 97 percent above 1947–49. Although precise figures were not collected on naphthalene production from tar, it was estimated that 0.75 percent of the quantity recovered at coke plants was obtained from tar processing. A tar product that increased substantially in sales was pitch. Several coke plants that process tar began making roofing pitch in 1955, and sales amounted to nearly $2.5 million in 1956. Only 9 percent of the total production was sold; pitch was used mostly as open-hearth fuel.

COKE-OVEN AMMONIA

In the United States chemical nitrogen was first produced by carbonizing coal, but in 1956 coke ovens supplied only 7 percent of our national output. Direct synthetic processing for ammonia replaced coal carbonization as the principal source of chemical-nitrogen supply between the two World Wars. Ammonia at coke plants is recovered in two forms: (1) As an aqueous solution known as ammonia liquor and (2) as a crystalline solid such as ammonium sulfate and diammonium phosphate. In 1956, of the 78 plants recovering ammonia, 13 made ammonia liquor, 65 made ammonium sulfate, 3 made diammonium phosphate, and 1 made ammonium thiocyanate (1 made both sulfate and liquor, 2 made sulfate and diammonium phosphate, and 1 made sulfate and ammonium thiocyanate). About 91 percent of the total ammonia recovered in 1956 was converted into sulfate,

TABLE 51.—Coke-oven ammonia produced and sold in the United States in 1956, by States, in pounds

State	Active plants [1]	Produced			
		Sulfate equivalent	Per ton of coal coked	As sulfate	As liquor (NH_3 content)
Alabama	7	173, 170, 331	21. 98	165, 227, 392	2, 047, 677
California	1	[2] 35, 218, 760	20. 86	[2] 35, 218, 760	----------
Colorado	1	[3] 24, 291, 832	21. 48	[3] 24, 291, 832	----------
Illinois	7	74, 597, 273	19. 39	[4] 86, 457, 843	----------
Indiana	5	172, 697, 808	14. 40	[4] 157, 708, 025	806, 706
Maryland	1	89, 178, 494	21. 24	89, 178, 494	----------
Massachusetts	1	[5] 17, 042, 198	19. 99	[5] 17, 042, 198	----------
Michigan	4	[6] 81, 510, 435	17. 18	[6] 61, 618, 387	5, 128, 138
Minnesota	3	20, 442, 037	14. 58	20, 442, 037	----------
New Jersey	2	27, 986, 600	17. 23	27, 986, 600	----------
New York	3	120, 949, 978	22. 27	100, 512, 000	5, 268, 878
Ohio	16	301, 565, 626	17. 98	256, 559, 939	11, 602, 394
Pennsylvania	14	575, 228, 688	20. 60	572, 762, 974	635, 657
Tennessee	1	5, 482, 262	21. 21	5, 482, 262	----------
Texas	2	19, 250, 860	22. 02	19, 250, 860	----------
Utah	2	53, 511, 873	25. 47	53, 511, 873	----------
West Virginia	4	106, 446, 092	19. 38	106, 446, 092	----------
Connecticut, Kentucky, Missouri, and Wisconsin	4	51, 033, 017	17. 58	12, 739, 300	9, 872, 059
Total 1956	78	1, 949, 604, 164	19. 28	1, 812, 436, 868	35, 361, 509
At merchant plants	21	234, 640, 400	18. 89	122, 534, 125	28, 900, 818
At furnace plants	57	1, 714, 963, 764	19. 33	1, 689, 902, 743	6, 460, 691
Total 1955	79	2, 091, 596, 851	20. 06	1, 962, 652, 237	33, 241, 715

See footnotes at end of table.

TABLE 51.—Coke-oven ammonia produced and sold in the United States in 1956, by States, in pounds—Continued

State	Sold				On hand Dec. 31	
	As sulfate		As liquor (NH_3 content)		Sulfate	Liquor (NH_3 content)
	Quantity	Value	Quantity	Value		
Alabama	148,828,061	$2,386,217	2,017,900	[7]	41,665,415	52,380
California	[8] 40,458,000	[7]			[9] 9,648,000	
Colorado	[3] 30,471,240	[7]			[3] 6,625,958	
Illinois	96,319,603	1,615,951			16,199,135	
Indiana	140,162,128	2,353,541	1,166,114	[7]	59,429,483	451,730
Maryland	90,124,950	[7]			13,151,525	
Massachusetts	[5] 17,106,738	[7]			[5] 1,154,740	
Michigan	[10] 72,797,053	[7]	3,185,801	[7]	[11] 9,540,839	614,991
Minnestoa	25,488,274	545,652			2,697,240	
New Jersey	27,491,640	[7]			3,311,580	
New York	101,706,000	[7]	5,226,015	[7]	11,322,000	97,305
Ohio	278,696,102	4,610,302	10,320,341	$350,886	36,183,838	1,316,511
Pennsylvania	583,365,122	8,257,761	625,060	[7]	129,027,760	57,936
Tennessee	6,660,700	[7]			948,856	
Texas	19,479,920	[7]			1,594,994	
Utah	48,564,460	[7]			28,599,101	
West Virginia	106,135,108	1,524,100			8,947,718	
Connecticut, Kentucky, Missouri, and Wisconsin	12,788,060	202,239	10,046,247	348,173	1,825,580	423,627
Undistributed		9,501,301		506,334		
Total 1956	1,846,643,159	30,997,064	32,587,478	1,205,393	381,873,762	3,014,480
At merchant plants	124,702,783	2,301,583	25,719,433	953,911	13,387,806	2,410,110
At furnace plants	1,721,940,376	28,695,481	6,868,045	251,482	368,485,956	604,370
Total 1955	1,853,959,657	36,116,705	20,009,869	834,546	418,042,234	3,302,719

[1] Number of plants that recovered ammonia.
[2] Includes 6,310,000 pounds of diammonium phosphate.
[3] Diammonium phosphate.
[4] Difference between actual production of sulfate and sulfate equivalent owing to transfer of liquor from Indiana for conversion into sulfate in Illinois by same company.
[5] Includes ammonium thiocyanate.
[6] Includes 16,434,846 pounds of diammonium phosphate.
[7] Included with "Undistributed" to avoid disclosing individual company figures.
[8] Includes 5,090,000 pounds of diammonium phosphate.
[9] Includes 1,220,000 pounds of diammonium phosphate.
[10] Includes 11,584,020 pounds of diammonium phosphate.
[11] Includes 4,996,126 pounds of diammonium phosphate.

7 percent into ammonia liquor, and about 3 percent into diammonium phosphate. Virtually all of the ammonium sulfate and diammonium phosphate was used as fertilizer in agriculture. The ammonia liquor was used for industrial and agricultural purposes.

More of ammonium sulfate was sold than was produced; stocks of sulfate were reduced 9 percent but were the second highest on record and equivalent to 77 days' production. To reduce stocks accumulated during 1955, the price was cut $10.00 per ton in May, causing the average unit value per ton on sales of the industry for the year to decline from $38.00 in 1955 to $34.00. The price of ammonia liquor (NH_3 content) also dropped from $0.042 per pound to $0.037.

CRUDE LIGHT OIL AND DERIVATIVES

Ever since the First World War, when the recovery of light-oil products became an important part of coke-oven operations, over 90 percent of the light-oil production at coke plants has been refined on the premises. Although this refining pattern has not varied greatly important changes have been made in refining methods and the demands for different kinds of light-oil derivatives vary considerably.

The trend in recent years has been to manufacture higher quality materials for chemical processing. In some applications extremely high purity is essential, and in 1956 two of our larger coal-chemical producers began constructing new facilities to produce benzene to meet the most exacting specifications.[3]

Requirements for chemical grades of benzene in recent years were much higher than could be supplied by coke ovens; increasing quantities were made from petroleum. Whereas coal carbonization supplied 83 percent of our total production of benzene from raw materials originating in the United States in 1950, in 1956 the supply of benzene was made up as follows: At coke plants, 52 percent; at tar distilleries, from domestic and imported material, 15 percent; and from petroleum refineries, 33 percent.

Benzene is used as a starting material for producing many intermediate organic chemicals. The principal consumers of benzene are the manufacturers of synthetic phenol, styrene, nylon, detergents, and aniline. These five uses alone were estimated to utilize more than three-fourths of the total benzene consumption in the United States in 1956. The Coal Chemicals Committee of the American Coke and Coal Chemicals Institute has followed closely the consumption pattern of benzene, and its estimates for 1955–57 are shown in table 57.

TABLE 52.—Coke-oven crude light oil produced in the United States and derived products produced and sold in 1956, by States, in gallons

State	Active plants [1]	Crude light oil				Derived products		
		Produced	Per ton of coal coked	Refined on premises [2]	On hand Dec. 31	Produced	Sold [3]	
							Quantity	Value
Alabama	7	20, 620, 334	2. 62	20, 273, 280	352, 913	16, 343, 435	16, 098, 328	$5, 453, 186
California	1	5, 684, 785	3. 37	5, 701, 029	14, 116	4, 449, 589	4, 529, 630	(4)
Colorado	1	4, 130, 497	3. 65	4, 126, 902	27, 340	3, 624, 482	3, 637, 762	(4)
Illinois	7	10, 749, 268	2. 79	7, 701, 895	177, 889	6, 554, 284	6, 633, 339	2, 222, 540
Indiana	4	28, 255, 266	2. 42	27, 221, 755	2, 577, 321	24, 050, 014	23, 752, 128	7, 799, 527
Maryland	1	14, 404, 940	3. 43	14, 539, 805	154, 690	12, 492, 155	12, 543, 780	(4)
Massachusetts	1	2, 333, 108	2. 74	3, 659, 729	82, 903	2, 989, 562	3, 063, 336	(4)
Michigan	4	12, 931, 150	2. 72	6, 932, 435	227, 215	5, 985, 519	5, 404, 416	1, 812, 268
New Jersey	1	2, 804, 739	2. 62	------------	34, 820	------------	------------	----------
New York	3	17, 081, 112	3. 15	27, 050, 401	267, 995	23, 663, 463	23, 907, 842	7, 784, 330
Ohio	16	47, 779, 565	2. 85	43, 961, 859	463, 451	36, 205, 148	35, 574, 686	11, 385, 827
Pennsylvania	14	87, 653, 713	3. 14	86, 431, 637	1, 228, 919	72, 547, 273	71, 363, 635	23, 229, 693
Tennessee	1	618, 725	2. 39	612, 293	15, 329	519, 758	486, 529	(4)
Texas	2	2, 355, 921	2. 70	2, 354, 987	7, 057	2, 064, 928	2, 063, 987	(4)
Utah	2	7, 592, 060	3. 61	7, 595, 474	98, 494	6, 947, 154	6, 456, 577	(4)
West Virginia	5	18, 114, 860	3. 02	16, 350, 671	196, 269	13, 849, 592	12, 385, 830	4, 043, 122
Connecticut, Kentucky, Missouri, and Wisconsin	4	7, 862, 166	2. 56	2, 251, 062	280, 166	1, 942, 506	1, 915, 050	604, 041
Undistributed	--------	------------	--------	------------	----------	------------	------------	10, 719, 842
Total 1956	74	290, 972, 209	2. 92	276, 765, 214	6, 206, 887	234, 228, 862	229, 816, 855	75, 054, 376
At merchant plants	19	28, 984, 510	2. 49	23, 816, 083	1, 140, 584	20, 689, 303	18, 753; 139	5, 766, 916
At furnace plants	55	261, 987, 699	2. 98	252, 949, 131	5, 066, 303	213, 539, 559	211, 063, 716	69, 287, 460
Total 1956	75	297, 497, 792	2. 91	281, 200, 190	5, 412, 336	235, 576, 183	224, 948, 002	74, 972, 106

1 Number of plants that recovered crude light oil.
2 Includes small quantity of material also reported in sales of crude light oil in table 43.
3 Excludes 14,628,164 gallons of crude light oil valued at $3,176,711 sold as such.
4 Included with "Undistributed" to avoid disclosing individual company figures.

3 Technology Newsletter, Chemical Week, August 18, 1956, p. 69.

TABLE 53.—Yield of light-oil products from refining crude light oil at oven-coke plants in the United States, 1929, 1939, 1947–49 (average), and 1952–56, in percent

Year	Benzene		Toluene, crude and refined	Xylene, crude and refined	Solvent naphtha	Other light-oil products
	Motor	All other grades				
1929	54.4	12.8	9.4	(1)	3.7	3.4
1939	48.6	15.4	12.1	2.5	2.9	3.8
1947–49 (average)	6.5	59.2	11.7	3.1	2.3	3.3
1952	(2)	65.4	12.9	3.4	2.0	2.6
1953	.4	63.7	12.9	3.6	2.3	2.2
1954	1.4	59.6	14.3	4.3	2.0	1.7
1955	(2)	62.0	13.6	4.0	2.0	2.3
1956	(2)	63.0	13.5	3.7	2.1	2.3

[1] Included with solvent naphtha.
[2] Included with "Other light-oil products" to avoid disclosing individual company figures.

TABLE 54.—Benzene and toluene produced at oven-coke plants in the United States, 1941, 1947–49 (average), and 1952–56, by grades, in gallons

Year	Benzene				Toluene		
	Motor	Nitration or 1° C.	Pure commercial or 2° C.	All other	Nitration or 1° C.	Pure commercial or 2° C.	All other
1941	106,372,000	15,414,500	18,286,400	4,182,600	14,689,800	13,268,500	1,378,900
1947–49 (average)	15,246,900	38,335,100	98,395,100	2,535,900	21,407,400	5,529,200	568,600
1952	(1)	46,211,300	104,030,800	4,872,200	21,342,000	7,613,400	1,567,100
1953	1,160,000	51,566,400	120,939,500	5,086,900	26,834,400	8,330,500	871,600
1954	3,327,100	44,383,000	92,336,600	2,718,200	24,718,800	7,775,600	888,600
1955	(1)	87,642,000	84,125,700	2,452,600	30,037,900	8,167,500	(2)
1956	(1)	74,312,800	97,393,000	2,720,200	29,673,600	7,564,500	(2)

[1] Withheld to avoid disclosing individual company figures.
[2] Combined with "Pure commercial or 2° C." to avoid disclosing individual company figures.

TABLE 55.—Production and sales of light-oil derivatives at coke ovens in the United States in 1956, by States, in gallons

State	Benzene (all grades except motor)				Toluene (all grades)			
	Production	Yield from crude light oil refined (percent)	Sales		Production	Yield from crude light oil refined (percent)	Sales	
			Quantity	Value			Quantity	Value
Alabama	12, 592, 863	62. 1	12, 576, 620	$4, 418, 065	2, 672, 321	13. 2	2, 443, 392	$741, 733
California	3, 310, 081	58. 1	3, 335, 064	(1)	839, 275	14. 7	868, 401	(1)
Colorado	2, 613, 303	63. 3	2, 641, 862	(1)	581, 803	14. 1	590, 180	(1)
Illinois and Missouri	5, 857, 527	67. 9	5, 965, 126	2, 060, 812	973, 527	11. 3	975, 758	309, 055
Indiana	19, 775, 784	72. 6	19, 549, 044	6, 661, 767	2, 771, 585	10. 2	2, 967, 546	890, 577
Maryland	9, 473, 725	65. 2	9, 347, 228	(1)	2, 300, 148	15. 8	2, 460, 487	(1)
Massachusetts	2, 318, 787	63. 4	2, 406, 570	(1)	500, 702	13. 7	481, 437	(1)
Michigan and Wisconsin	5, 542, 978	67. 1	4, 902, 474	1, 702, 479	1, 134, 336	13. 7	1, 167, 694	349, 496
New York	17, 904, 766	66. 2	18, 192, 376	6, 268, 321	3, 367, 289	12. 4	3, 367, 551	1, 018, 516
Ohio	28, 035, 686	63. 8	27, 971, 050	9, 217, 449	5, 075, 394	11. 5	5, 021, 217	1, 464, 940
Pennsylvania	50, 542, 399	58. 5	51, 308, 570	17, 753, 304	12, 919, 710	14. 9	11, 169, 286	3, 098, 255
Tennessee	368, 696	60. 2	347, 122	(1)	109, 585	17. 9	95, 022	(1)
Texas	1, 659, 412	70. 5	1, 650, 483	(1)	250, 925	10. 7	249, 290	(1)
Utah	4, 572, 753	60. 2	4, 564, 781	(1)	1, 187, 373	15. 6	1, 399, 338	(1)
West Virginia	9, 857, 263	60. 3	8, 661, 715	3, 046, 278	2, 554, 091	15. 6	2, 327, 037	658, 158
Undistributed				8, 419, 195				1, 631, 139
Total 1956	174, 426, 023	63. 0	173, 420, 085	59, 547, 670	37, 238, 064	13. 5	35, 583, 636	10, 161, 869
At merchant plants	14, 468, 166	60. 7	12, 983, 930	4, 330, 543	3, 299, 631	13. 9	2, 981, 047	924, 722
At furnace plants	159, 957, 857	63. 2	160, 436, 155	55, 217, 127	33, 938, 433	13. 4	32, 602, 589	9, 237, 147
Total 1955	174, 220, 342	62. 0	168, 750, 351	58, 662, 871	38, 205, 443	13. 6	36, 651, 693	10, 962, 817

State	Xylene (all grades)				Solvent naphtha (crude and refined)			
	Production	Yield from crude light oil refined (percent)	Sales		Production	Yield from crude light oil refined (percent)	Sales	
			Quantity	Value			Quantity	Value
Alabama	661, 115	3. 3	681, 337	$222, 603	219, 032	1. 1	211, 623	$56, 215
California	138, 764	2. 4	156, 912	(1)	161, 469	2. 8	169, 253	(1)
Colorado	211, 786	5. 1	187, 137	(1)	217, 590	5. 3	218, 583	(1)
Illinois and Missouri	178, 154	2. 1	179, 369	59, 603	85, 428	1. 0	75, 754	22, 155
Indiana	465, 583	1. 7	393, 413	128, 241	883, 097	3. 2	842, 125	118, 942
Maryland	718, 282	4. 9	736, 065	(1)				
Massachusetts	100, 515	2. 7	96, 353	(1)	69, 558	1. 9	78, 976	(1)
Michigan and Wisconsin	273, 547	3. 3	301, 330	99, 257	856	(2)	443	(1)
New York	783, 894	2. 9	739, 406	308, 233	109, 104	0. 4	108, 779	(1)
Ohio	1, 805, 303	4. 1	1, 858, 297	507, 611	719, 753	1. 6	702, 227	193, 199
Pennsylvania	3, 885, 261	4. 5	3, 858, 288	1, 242, 765	2, 777, 873	3. 2	2, 712, 264	767, 081
Tennessee	41, 477	6. 8	44, 385	(1)				
Texas	78, 360	3. 3	88, 453	(1)	76, 231	3. 2	75, 761	(1)
Utah	237, 854	3. 1	212, 166	(1)	266, 784	3. 5	273, 484	(1)
West Virginia	759, 922	4. 6	704, 380	214, 090	237, 844	1. 5	234, 265	43, 946
Undistributed				462, 954				236, 118
Total 1956	10, 339, 817	3. 7	10, 237, 291	3, 245, 357	5, 824, 619	2. 1	5, 703, 537	1, 437, 656
At merchant plants	900, 497	3. 8	834, 746	289, 734	172, 776	0. 7	169, 775	43, 166
At furnace plants	9, 439, 320	3. 7	9, 402, 545	2, 955, 623	5, 651, 843	2. 2	5, 533, 762	1, 394, 490
Total 1955	11, 294, 085	4. 0	10, 856, 948	3, 483, 848	5, 511, 382	2. 0	5, 380, 357	1, 383, 294

[1] Included with "Undistributed" to avoid disclosing individual company figures.
[2] Less than 0.05 percent.

TABLE 56.—Production of benzene (excluding motor grade) in the United States, 1952–56, in thousand gallons [1]

Year	From tar distilleries [2]					From coke-oven operations				
	Produced	Percent of total	Sold			Produced	Percent of total	Sold		
			Quantity	Value				Quantity	Value	
				Total	Average				Total	Average
1952	61,035	24.3	37,489	$18,552	$0.49	155,114	61.6	152,859	$51,870	$0.34
1953	32,108	11.8	19,224	8,496	.44	177,593	65.1	172,405	66,479	.39
1954	25,460	9.9	18,344	7,413	.40	139,438	54.3	131,857	50,958	.39
1955	34,671	11.3	24,948	7,970	.32	174,220	56.6	168,750	58,663	.35
1956	50,551	15.0	34,698	10,377	.30	174,426	51.8	173,420	59,548	.34

Year	From petroleum refineries					Total				
	Produced	Percent of total	Sold			Produced	Percent of total	Sold		
			Quantity	Value				Quantity	Value	
				Total	Average				Total	Average
1952	35,518	14.1	26,650	$12,788	$0.48	251,667	100.0	216,998	$83,210	$0.38
1953	63,043	23.1	41,071	20,790	.51	272,744	100.0	232,700	95,765	.41
1954	91,912	35.8	51,714	24,631	.48	256,810	100.0	201,915	83,002	.41
1955	98,588	32.1	71,110	30,901	.43	307,479	100.0	264,808	97,534	.37
1956	111,613	33.2	76,331	32,834	.43	336,590	100.0	284,449	102,759	.36

[1] U. S. Tariff Commission.
[2] Includes benzene made from imported crude light oil.

TABLE 57.—Estimated consumption of commercial benzene (excluding motor grade) in the United States, 1955–57, by uses, in thousand gallons [1]

Use	1955	1956	1957
Styrene	120,000	132,000	132,000
Phenol (synthetic)	63,000	65,000	65,000
Detergents (Dodecyl benzene)	24,000	30,000	30,000
Synthetic fibers	25,000	30,000	30,000
Aniline	16,500	16,000	16,000
DDT	12,000	13,500	13,500
Di- and Mono-chlorobenzene	9,500	10,000	10,000
Maleic anhydride	7,500	6,500	6,500
Benzene hexachloride	4,500	6,500	6,500
Diphenyls	4,500	4,500	4,500
Nitrobenzene	2,000	2,000	2,000
Miscellaneous	10,000	20,000	20,000
Export	2,500	4,000	4,000
Total	301,000	340,000	340,000

[1] Estimated by the Coal Chemicals Committee, American Coke and Coal Chemicals Institute, Washington, D. C.

TABLE 58.—Crude naphthalene produced and sold by coke-plant operators in the United States, 1952–56, by grades, in pounds

Year	Solidifying under 74° C.				From 74° to 79° C.			
	Produced	Sold			Produced	Sold		
		Quantity	Value			Quantity	Value	
			Total	Average			Total	Average
1952	46,979,403	47,306,112	$1,831,714	$0.039	59,924,103	49,151,700	$3,129,943	$0.064
1953	56,676,867	52,974,072	1,938,497	.037	56,260,347	38,568,039	2,448,929	.063
1954	22,857,876	24,675,886	642,887	.026	77,201,155	72,625,985	3,726,375	.051
1955	38,199,282	37,678,838	1,318,973	.035	146,023,756	136,109,946	8,216,199	.060
1956	34,472,210	32,428,387	1,236,402	.038	142,786,672	103,500,476	7,035,576	.068

TABLE 59.—Crude naphthalene produced and sold by coke-plant operators in the United States in 1956, by States, in pounds

State	Active plants [1]	Produced	Sold			On hand Dec. 31
			Quantity	Value		
				Total	Average	
Alabama	6	18,849,299	15,656,111	$933,190	$0.060	3,879,704
Colorado	1	584,350	591,140	(2)	(2)	88,400
Illinois	5	7,742,583	7,157,838	403,276	.056	944,032
Indiana	2	52,073,734	47,795,098	(2)	(2)	4,593,691
Maryland	1	2,945,791	2,548,440	(2)	(2)	610,381
Massachusetts	1	1,274,148	1,274,148	(2)	(2)	----------
New York	2	1,705,072	1,724,132	(2)	(2)	99,274
Ohio	10	15,034,728	14,392,875	661,744	.046	1,100,240
Pennsylvania	8	72,859,107	40,642,310	2,526,769	.062	21,967,311
Tennessee	1	293,454	257,800	(2)	(2)	52,379
Utah	1	1,539,060	1,492,900	(2)	(2)	88,600
Michigan, New Jersey, and West Virginia	4	2,357,556	2,396,071	113,328	.047	238,796
Undistributed	------	----------	(2)	3,633,671	.065	----------
Total 1956	42	177,258,882	135,928,863	8,271,978	.061	33,662,808
At merchant plants	4	2,178,064	2,242,049	121,228	.054	124,585
At furnace plants	38	175,080,818	133,686,814	8,150,750	.061	33,538,223
Total 1955	45	184,223,038	173,788,784	9,535,172	.055	4,058,264

[1] Number of plants that recovered naphthalene.
[2] Included with "Undistributed" to avoid disclosing individual company figures.

COKE OVENS OWNED BY CITY GAS COMPANIES

(PUBLIC UTILITIES)

The Peoples Gas Light & Coke Co. retired its battery of ovens at Chicago, Ill., on July 1, 1956. This left only 3 active plants at the end of the year and production of coke from this source amounted to only 2 percent of the national output. Production of oven coke at public utility plants has declined 70 percent since the end of World War II, mostly since 1950. This downward trend in coke production has been caused principally by substituting natural gas for coke-oven gas in many areas. Although some utilities operating coke ovens have been mixing the output of gas from their ovens with natural gas, it appeared that this procedure might be discontinued in the near future in favor of straight natural gas. This changeover appeared imminent because of the increasing load factor. The distribution of straight natural gas permits the distribution of more heat units (British thermal units) during periods of peak loads in the heavy burning season. Details on coal carbonized and coke, gas, and other coal-chemical materials produced in 1956 by gas utilities are shown in table 6.

TABLE 60.—Coke, breeze, and coal-chemical materials produced in the United States at oven-coke plants owned by city gas companies (public utilities) [1] compared with all other oven-coke plants, 1955–56

	1955			1956		
	Plants not owned by city gas companies	Plants owned by city gas companies (public utilities)	Total	Plants not owned by city gas companies	Plants owned by city gas companies (public utilities)	Total
Number of active plants	77	4	81	76	4	80
Coke:						
Produced ... net tons	72, 578, 092	1, 006, 122	73, 584, 214	70, 876 625	1, 115, 617	71, 992, 242
Value	$1, 181, 289, 636	$18, 340, 537	$1, 199, 630, 173	$1, 252, 021, 155	$22, 192, 625	$1, 274, 213, 780
Average per ton	$16. 28	$18. 23	$16. 30	$17. 66	$19. 89	$17. 70
Breeze:						
Produced ... net tons	4, 788, 353	73, 872	4, 862, 225	4, 696, 070	75, 743	4, 771, 813
Sold ... do	1, 157, 418	13, 089	1, 170, 507	1, 123, 116	542	1, 123, 658
Value of sales	$6, 582, 511	$78, 564	$6, 661, 075	$7, 228, 058	$3, 314	$7, 231, 372
Average per ton	$5. 69	$6. 00	$5. 69	$6. 44	$6. 11	$6. 44
Coal carbonized:						
Bituminous ... net tons	103, 150, 763	1, 356, 942	104, 507, 705	100, 421, 929	1, 449, 493	101, 871, 422
Anthracite ... do	317, 461	48, 707	366, 168	333, 258	44, 053	377, 311
Total ... do	103, 468, 224	1, 405, 649	104, 873, 873	100, 755, 187	1, 493, 546	102, 248, 733
Value	$913, 290, 147	$14, 082, 562	$927, 372, 709	$940, 197, 699	$15, 681, 107	$955, 878, 806
Average	$8. 83	$10. 02	$8. 84	$9. 33	$10. 50	$9. 35
Coke:						
Used by producing companies:						
Net tons	64, 169, 201	74, 948	64, 244, 149	61, 299, 892	66, 236	61, 366, 128
Value	$1, 042, 281, 498	$1, 125, 911	$1, 043, 407, 409	$1, 078, 297, 582	$1, 079, 954	$1, 079, 377, 536
Commercial sales:						
Net tons	9, 261, 043	1, 176, 000	10, 437, 043	8, 979, 159	1, 016, 014	9, 995, 173
Value	$153, 682, 831	$21, 700, 049	$175, 382, 880	$163, 399, 726	$20, 396, 353	$183, 796, 079
Coal-chemical materials:						
Tar:						
Produced ... gallons	843, 003, 635	9, 919, 182	852, 922, 817	822, 717, 113	10, 109, 929	832, 827, 042
Sold ... do	388, 676, 714	9, 703, 357	398, 380, 071	405, 795, 701	10, 490, 686	416, 286, 387
Value of sales	$44, 834, 435	$1, 164, 572	$45, 999, 007	$48, 824, 189	$1, 304, 708	$50, 128, 897
Ammonia:						
Produced (NH_3 equivalent of all forms) ... pounds	532, 480, 273	6, 733, 189	539, 213, 462	495, 701, 466	6, 915, 675	502, 617, 141
Liquor (NH_3 content):						
Produced ... do	32, 959, 744	281, 971	33, 241, 715	34, 725, 852	635, 657	35, 361, 509
Sold ... do	19, 746, 857	263, 012	20, 009, 869	31, 962, 418	625, 060	32, 587, 478
Value of sales	$825, 735	$8, 811	$834, 546	$1, 186, 642	$18, 751	$1, 205, 393
Sulfate: [2]						
Produced ... pounds	1, 937, 628, 118	25, 024, 119	1, 962, 652, 237	1, 788, 076, 830	24, 360, 038	1, 812, 436, 868
Sold ... do	1, 831, 982, 035	21, 977, 622	1, 853, 959, 657	1, 819, 755, 174	26, 887, 985	1, 846, 643, 159
Value of sales	$35, 639, 088	$477, 617	$36, 116, 705	$30, 513, 577	$483, 487	$30, 997, 064

Gas:						
Produced ... M cubic feet	1,069,638,913	13,985,682	1,083,624,595	1,040,521,257	14,807,425	1,055,328,682
Disposal of surplus:						
Used under boilers:						
M cubic feet	57,141,504	75,051	57,216,555	63,371,967	971	63,372,938
Value	$9,877,034	$43,079	$9,920,113	$10,325,042	$524	$10,325,566
Average per M cubic feet	$0.173	$0.574	$0.173	$0.163	$0.540	$0.163
Used in steel or allied plants:						
M cubic feet	[3] 523,010,328	----------	[3] 523,010,328	497,279,254	----------	497,279,254
Value	[3] $111,452,781	----------	[3] $111,452,781	$108,006,604	----------	$108,006,604
Average per M cubic feet	[3] $0.213	----------	[3] $0.213	$0.217	----------	$0.217
Distributed through city mains:						
M cubic feet	59,044,361	11,417,381	70,461,742	53,820,501	10,482,482	64,302,983
Value	$22,347,621	$5,410,043	$27,757,664	$21,478,423	$4,805,627	$26,284,050
Average per M cubic feet	$0.378	$0.474	$0.394	$0.399	$0.458	$0.409
Sold for industrial use:						
M cubic feet	[3] 36,936,188	1,723,127	[3] 38,659,315	37,342,206	1,298,259	38,640,465
Value	[3] $6,415,182	$594,026	[3] $7,009,208	$6,445,354	$420,076	$6,865,430
Average per M cubic feet	[3] $0.174	$0.345	[3] $0.181	$0.173	$0.324	$0.178
Crude light oil:						
Produced ... gallons	296,875,772	622,020	297,497,792	290,361,406	610,803	290,972,209
Sold ... do	15,521,122	622,729	16,143,851	14,007,499	620,665	14,628,164
Value of sales	$3,364,748	$109,462	$3,474,210	$3,069,933	$106,778	$3,176,711
Light-oil derivatives:						
Produced ... gallons	235,576,183	----------	235,576,183	234,228,862	----------	234,228,862
Sold ... do	224,948,002	----------	224,948,002	229,816,855	----------	229,816,855
Value of sales	$74,972,106	----------	$74,972,106	$75,054,376	----------	$75,054,376
Naphthelene (crude):						
Produced ... pounds	184,223,038	----------	184,223,038	177,258,882	----------	177,258,882
Sold ... do	173,788,784	----------	173,788,784	135,928,863	----------	135,928,863
Value of sales	$9,535,172	----------	$9,535,172	$8,271,978	----------	$8,271,978
All other coal-chemical materials, value of sales	$21,294,534	$13,593	$21,308,127	$21,301,031	$11,808	$21,312,839

[1] Coke ovens built by city gas companies. Does not include independent oven-coke plants that may sell gas to public utility companies for distribution.
[2] Includes diammonium phosphate and ammonium thiocyanate.
[3] Revised figures.

Fuel Briquets and Packaged Fuel

By Eugene T. Sheridan and Maxine M. Otero

Contents

GENERAL SUMMARY

THE DEMAND for fuel briquets and packaged fuel continued to decline in 1956, with decreases in production from 1955 of 7 and 6 percent, respectively. Both fuels are used principally for space heating in this country; and their use in recent years has decreased considerably, primarily because of the substitution of fuel oil and natural gas.

Eleven States produced fuel briquets and 8 States produced packaged fuel in 1956. The principal centers of briquet production were the mining districts in southwestern West Virginia and the dock areas of northern and eastern Wisconsin. Wisconsin produced 36 percent of the total briquets and West Virginia 30 percent. Most packaged fuel was produced in the North Central States, Michigan and Wisconsin being the chief producers. Michigan alone produced more packaged fuel than all other producing States combined.

Two fuel-briquet plants and 5 packaged-fuel plants discontinued operations during 1956. The loss of these plants decreased the annual capacity of fuel-briquet and packaged-fuel plants 125,000 and 23,000 tons, respectively. The production rate of fuel-briquet plants decreased slightly by operating at 41 percent of annual capacity, but packaged-fuel plants increased production rates 2.3 points by operating at 37 percent of annual capacity.

Low-volatile bituminous coal was the principal raw material used for manufacturing both fuels in 1956. Other raw fuels were high-volatile bituminous coal, Pennsylvania anthracite, other anthracite, semianthracite, petroleum coke, and residual carbon. Petroleum asphalt was the principal binding material used for briquets, while starch was the preferred binder for packaged fuel. In the manufacture of briquets an average of about 150 pounds of asphalt was used per ton of raw fuel by the plants that employed a binder. Only about 10 pounds of starch per ton of raw fuel was used by the packaged-fuel plants that employed starch as a binder. Two plants that utilized residual carbon as raw fuel for briquets used no binder in their process.

Briquets differ from packaged fuel in appearance and shape, as well as in composition. Whereas briquets are usually small, pillow-shaped objects 2 to 4 inches in length, weighing 2 to 4 ounces, packaged fuel is usually produced as 3- to 4-inch cubes, 6 or 8 of which are wrapped in heavy paper, forming a package weighing 10 to 15 pounds. Briquets use a water-insoluble binder and are designed for rough handling and weathering, whereas packaged fuel uses a water-soluble binder and must be stored indoors to prevent deterioration.

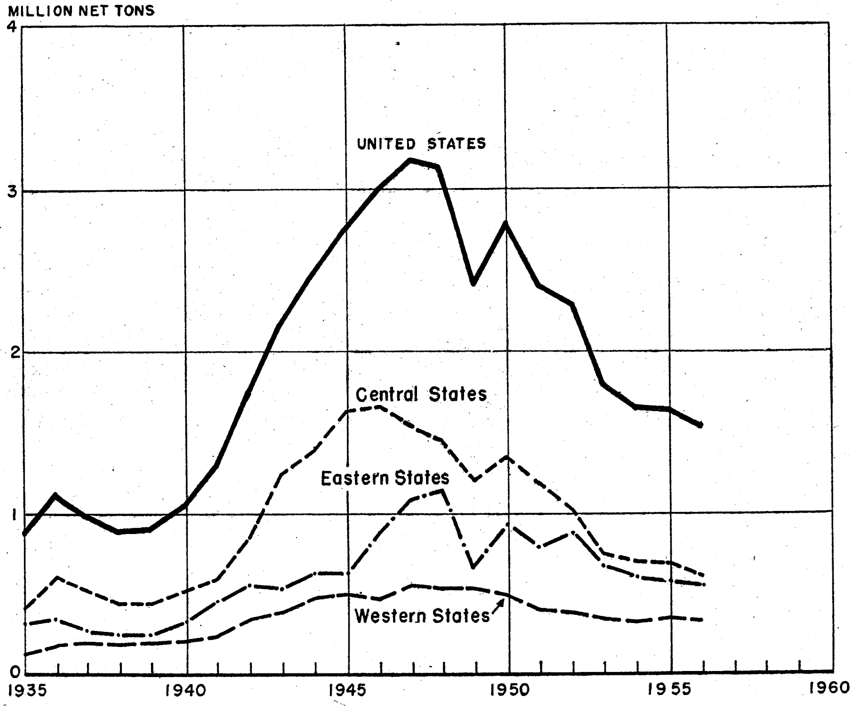

FIGURE 1.—Production of fuel briquets in the United States, 1935—56, by regions

TABLE 1.—Salient statistics of the fuel-briquetting and packaged-fuel industry in the United States, 1947–49 (average) and 1953–56

	1947–49 (average)	1953	1954	1955	1956
FUEL BRIQUETS					
Production .... net tons..	2, 901, 348	1, 780, 061	1, 624, 462	1, 629, 542	1, 518, 540
Value of production	$31, 805, 000	$21, 111, 293	$19, 161, 635	$19, 037, 987	$18, 221, 686
Average value per net ton, f. o. b. plant...	$10. 96	$11. 86	$11. 80	$11. 68	$12. 00
Imports [1] .... net tons..	360	97	239	....	318
Exports [1] .... do....	207, 928	102, 907	98, 908	106, 294	107, 452
Apparent consumption [2] .... do....	2, 693, 780	1, 677, 251	1, 525, 793	1, 523, 248	1, 411, 406
World production .... do....	62, 000, 000	[3] 106,100,000	[3] 108,900,000	[3] 114,600,000	118, 700, 000
PACKAGED FUEL					
Production .... net tons..	155, 281	79, 732	77, 360	69, 212	64, 960
Value of production	$2, 618, 238	$1, 492, 119	$1, 416, 606	$1, 194, 045	$1, 381, 880
Average value per net ton, f. o. b. plant...	$16. 86	$18. 71	$18. 31	$17. 25	$21. 27

[1] Compiled from the records of the U. S. Department of Commerce. Excludes exports of briquets map from petroleum coke and residual carbon from the manufacture of oil gas.
[2] Production plus imports minus exports.
[3] Revised figure.

SCOPE OF REPORT

The annual collection and publication of data on fuel briquets have been continuous since 1907, when the first canvass of the industry was undertaken by the Federal Geological Survey. Packaged-fuel statistics have been continuous since 1935, when the Bureau of Mines made the first annual canvass. All statistics in this chapter, except where otherwise noted, have been based upon reports submitted voluntarily to the Bureau of Mines by producing companies.

In 1956, 24 fuel-briquet plants were canvassed, and replies were received from 23. However, two plants discontinued operations and reported no production for 1956. Forty packaged-fuel plants were canvassed, and reports were received from 33. Of this number, 26 reported production, 1 was idle, 1 kept no production records, and 5 were permanently abandoned. The plants that did not reply were small, operating intermittently in previous years, and no attempt was made to estimate their production.

The average of the 3 years 1947–49 is used as a base for measuring production and consumption trends, and the standard unit of measurement is the short ton of 2,000 pounds.

FUEL BRIQUETS

CAPACITY

The annual productive capacity of the fuel-briquet industry decreased slightly (3 percent) in 1956, chiefly because 2 plants discontinued operations. Since 1948 the number of operating plants has slowly declined from 36 to 21. However, most of the plants that have gone out of production were small—in most instances with a designed capacity of less than 25,000 tons a year—and although the number of operating plants decreased 42 percent since 1948, the total annual capacity decreased only 20 percent. This trend resulted in an increase in the average capacity of the industry from 130,000 tons per plant in 1948 to 177,000 in 1956.

TABLE 2.—Annual capacity and production of briquetting plants in the United States, 1952–56

	Active plants	Annual capacity (net tons)	Production	
			Net tons	Percent of annual capacity
1952	28	4,442,500	2,279,756	51.3
1953	26	4,216,000	1,780,061	42.2
1954	25	4,161,000	1,624,462	39.0
1955	23	3,841,000	1,629,542	42.4
1956:				
Plants with capacity of—				
Less than 25,000 tons				
25,000 to less than 100,000 tons	6	290,000	135,618	46.8
100,000 to less than 200,000 tons	8	866,000	349,807	40.4
200,000 to less than 400,000 tons	4	1,060,000	392,710	37.0
400,000 or more tons	3	1,500,000	640,405	42.7
Total	21	3,716,000	1,518,540	40.9
Plants with production of—				
Less than 5,000 tons	3	[1] 305,000	[1] 27,397	9.0
5,000 to less than 10,000 tons				
10,000 to less than 25,000 tons	1			
25,000 to less than 100,000 tons	11	1,051,000	487,817	46.4
100,000 or more tons	6	2,360,000	1,003,326	42.5
Total	21	3,716,000	1,518,540	40.9

[1] Combined to avoid disclosing individual company figures.

The rate of operation in the larger plants is generally higher than in the smaller ones, but the decline in demand for fuel briquets in the past 10 years has caused the rate of production at all plants to decrease steadily.

The production rate of the industry decreased 1.5 points from 1955 but was still 1.9 points higher than in 1954, when the rate was the lowest since 1940.

PRODUCTION

Production of fuel briquets decreased 7 percent in 1956 and was the lowest since 1941. Briquets were produced in 11 States, but the principal centers of production were the mining districts of southwestern West Virginia and the dock areas of northern and eastern Wisconsin. Wisconsin and West Virginia produced 36 and 30 percent, respectively, of the total. Missouri, Pennsylvania, and Oregon also produced substantial quantities, and their output (combined with that of Wisconsin and West Virginia) was 90 percent of the total. Production increased slightly in 3 States in 1956, but these increases were more than offset by decreases in the other 8 producing States. Production of briquets is seasonal, and most plants operate at reduced rates or close entirely during the summer.

Raw Fuels.—Bituminous coal, the principal raw material used for manufacturing fuel briquets in 1956, constituted 56 percent of the total raw fuels used. The major part (over 90 percent) was low-volatile coal, which was consumed by 11 of the 13 plants that used bituminous coal as a raw fuel. Other fuels, in order of their importance in use, were Pennsylvania anthracite, petroleum coke, residual carbon, lignite char, semianthracite, and anthracite from States other than Pennsylvania.

TABLE 3.—Production and value of fuel briquets in the United States, 1955–56, by regions

Region [1]	1955				1956			
	Active plants	Production (net tons)	Value		Active plants	Production (net tons)	Value	
			Total	Average			Total	Average
Eastern States	4	587,572	$5,681,413	$9.67	4	561,383	$5,749,117	$10.24
Central States	12	686,743	9,118,863	13.28	10	619,321	8,869,700	14.32
Western States	7	355,227	4,237,711	11.93	7	337,836	3,602,869	10.66
Total	23	1,629,542	19,037,987	11.68	21	1,518,540	18,221,686	12.00

[1] Eastern States include Pennsylvania and West Virginia; Central States—Illinois, Indiana, Michigan, and Wisconsin; Western States (west of the Mississippi River)—Arkansas, Missouri, North Dakota, Oregon, and Washington.

TABLE 4.—Production of fuel briquets in the United States in 1956, by months

Month	Net tons	Month	Net tons	Month	Net tons
January	204,371	May	96,150	September	139,304
February	162,135	June	88,387	October	202,121
March	74,348	July	71,425	November	186,724
April	66,379	August	87,897	December	139,299

Sixteen percent of the raw fuels used for briquets was Pennsylvania anthracite, but the consumption of this fuel in 1956 was 14 percent lower than in 1955 due chiefly to decreased production of briquets by plants using anthracite rather than a substitution of other fuels.

Fifteen percent of the raw briquet fuel in 1956 was petroleum coke, and 4 percent more of this material was consumed in 1956 than in 1955. Most of the petroleum coke used in briquets was consumed by plants in Missouri and Wisconsin, where the price of this fuel competes with that of other fuels available in these areas.

Substantial quantities of residual carbon were converted into briquets by two plants on the west coast. One plant in Oregon and 1 in Washington used this type of raw fuel, which is available in this area from the manufacture of oil gas. However, since only 2 plants used residual carbon, the quantities cannot be shown separately but are included with lignite char used by 1 plant in North Dakota.

Twelve percent of the raw fuels was yard screenings; however, the major portion of the raw fuels came from other sources and consisted chiefly of screened slack from low-volatile bituminous coal mines in West Virginia, anthracite fines from Pennsylvania, and petroleum coke from oil refineries in the Central States. No plants used yard screenings exclusively, but 6 plants used yard screenings in addition to raw materials from other sources, while 15 plants used only raw fuel from other sources.

Binders.—Petroleum asphalt is used almost exclusively as a fuel-briquet binder in the United States. In 1956, however, in addition to asphalt, 1 plant used a small quantity of coal-tar pitch, and 2 plants used small quantities of spray oil. Although spray oil was used primarily for dustproofing, it may have certain binding properties, and the small amounts consumed were considered binders.

Petroleum asphalt makes an ideal binding material as it is relatively inexpensive, is water insoluble, and has a low ash content. Binders generally constitute 5 to 7 percent by weight of the raw materials in briquets, and an average briquet mix contains about 150 pounds of binder per ton of raw fuel. An average of 153 pounds of binder per ton of raw fuel was consumed in 1956 by producers who used a binder in their process. The average value of the binder consumed in manufacturing 1 ton of fuel briquets was $1.86.

Although the total amount of binding materials consumed in 1956 decreased 7 percent from 1955, the total value decreased only 2 per-

TABLE 5.—Raw fuels used in making fuel briquets in the United States in 1956

Type	Number of plants	Used: Net tons	Used: Value: Total	Used: Value: Average
Anthracite:				
Pennsylvania	10	227,627	$1,534,165	$6.74
Other than Pennsylvania	1	[1] 18,078	[1] 130,566	7.22
Semianthracite	3			
Bituminous coal:				
Low-volatile	11	[1] 809,847	[1] 6,262,999	7.73
High-volatile	2			
Petroleum coke	8	218,394	1,953,429	8.94
Residual carbon from manufacture of oil gas	2	[1] 169,567	[1] 1,194,519	7.04
Semicoke (lignite char)	1			
Total	[2] 21	1,443,513	11,075,678	7.67

[1] Combined to avoid disclosing individual company figures.
[2] Some plants used more than 1 type of raw fuel; hence, the sum of the plants exceeds the total shown.

TABLE 6.—Quantity and value of raw materials used in making fuel briquets in the United States and quantity and value of sales in 1956, by regions

Region [1]	Raw materials used					
	Fuels			Binders		
	Net tons	Value		Net tons	Value	
		Total	Average		Total	Average
Eastern States	522,242	$3,009,915	$5.76	39,141	$1,119,812	$28.61
Central States	598,016	5,766,255	9.64	44,393	1,098,126	24.74
Western States	323,255	2,299,508	7.11	16,013	341,772	21.34
Total	1,443,513	11,075,678	7.67	99,547	2,559,710	25.71

Region [1]	Total			Fuel briquets sold		
	Net tons	Value		Net tons	Value	
		Total	Average		Total	Average
Eastern States	561,383	$4,129,727	$7.36	561,179	$5,747,265	$10.24
Central States	642,409	6,864,381	10.69	619,408	8,869,774	14.32
Western States	339,268	2,641,280	7.79	339,268	4,189,370	12.35
Total	1,543,060	13,635,388	8.84	1,519,855	18,806,409	12.37

[1] Eastern States include Pennsylvania and West Virginia; Central States—Illinois, Indiana, Michigan, and Wisconsin; Western States (west of the Mississippi River)—Arkansas, Missouri, North Dakota, Oregon, and Washington.

cent, because of an increase in average value per ton. Nearly 100 thousand tons of asphalt valued at more than $2.5 million was consumed by 19 briquet plants in 1956. The average price per ton for all binding materials was $25.71.

SHIPMENTS

Unlike packaged fuel, briquets can be shipped long distances, and fuel briquets manufactured in the United States in 1956 were consumed in 36 States, the District of Columbia, 2 foreign countries, and Alaska. Except for a few States, however, the greater part of production was consumed within the producing State. In this chapter it is assumed that briquets are consumed in the State where shipments terminate, and "distribution" and "consumption" are used synonymously.

Wisconsin, the leading producing State, was also the largest consumer of briquets, using 17 percent of the total quantity distributed. In addition to supplying its own needs (virtually all of the briquets consumed in Wisconsin were produced within the State), Wisconsin shipped more than half of its production to seven other States and Canada. Most of Wisconsin's out-of-State shipments terminated in neighboring States, Minnesota receiving 45 percent. West Virginia, the second largest producer, shipped virtually all of its production to 17 other States and Canada. Michigan, Indiana, and Ohio were the largest consumers of briquets made in West Virginia and consumed 26, 25, and 18 percent, respectively, of West Virginia's shipments. Missouri ranked second in briquet consumption, followed by

Michigan and Minnesota. Missouri produced 79 percent of its requirements, but Michigan and Minnesota received the greater part of their requirements from other States. Other leading consuming States were Indiana, Ohio, and Illinois, which combined consumed 19 percent of the total distributed. According to reports from producers, 148,808 tons (10 percent of the total shipments) was exported. Data collected by the Bureau of Mines on exports of briquets (table 7) differ from those compiled by the Bureau of the Census (table 9), because the Bureau of Mines includes briquets made from residual carbon and petroleum coke, whereas the Bureau of the Census excludes these data.

About three-fourths of the total shipments in 1956 were by rail. Virtually all shipments from the Eastern States region and about three-fourths of the Central States region were by rail. Truck shipments were slightly higher than rail movements in the Western States.

Shipments by States of origin are not shown, because the small number of producing companies in each State would reveal individual operations.

Table 7.—Destination of shipments of fuel briquets, 1955–56, in net tons

(Based upon reports from producers showing destination of briquets used or sold)

Destination	1955	1956	Destination	1955	1956
Arkansas	2, 312	1, 793	North Carolina	32, 682	31, 934
California	1, 612	10, 173	North Dakota	65, 901	60, 571
Connecticut	1, 511	1, 875	Ohio	83, 595	84, 474
Delaware	52	20	Oklahoma	72	148
District of Columbia	688	588	Oregon	59, 031	52, 727
Florida	356	208	Pennsylvania	9, 836	8, 732
Illinois	89, 670	82, 395	Rhode Island	403	438
Indiana	120, 044	114, 994	South Carolina	4, 469	6, 576
Iowa	44, 984	32, 125	South Dakota	57, 679	50, 886
Kansas	5, 865	6, 425	Tennessee	1, 893	1, 869
Kentucky	5, 685	4, 561	Texas		43
Maine	5, 464	5, 087	Vermont	1, 217	1, 260
Maryland	7, 136	6, 220	Virginia	40, 185	36, 698
Massachusetts	8, 980	5, 939	Washington	26, 783	22, 221
Michigan	180, 322	160, 790	West Virginia	1, 241	1, 091
Minnesota	147, 363	134, 314	Wisconsin	267, 114	255, 458
Missouri	196, 277	167, 864			
Montana			Total	1, 489, 262	1, 371, 047
Nebraska	9, 663	10, 889	Exported	144, 161	148, 808
New Hampshire	2, 045	2, 101			
New Jersey	1, 033	1, 494	Grand total	1, 633, 423	1, 519, 855
New York	6, 099	6, 066			

TABLE 8.—Shipments of fuel briquets in the United States, 1955–56, by methods of transportation, in net tons [1]

Origin	1955			1956		
	Rail	Truck [2]	Total	Rail	Truck [2]	Total
Eastern States	577, 098	10, 687	587, 785	550, 644	10, 535	561, 179
Central States	513, 443	172, 519	685, 962	456, 729	160, 002	616, 731
Western States	142, 386	213, 636	356, 022	156, 790	180, 162	336, 952
Total	1, 232, 927	396, 842	[3] 1, 629, 769	1, 164, 163	350, 699	[3] 1, 514, 862

[1] Includes shipments destined for export as reported by producers directly to Bureau of Mines.
[2] Includes small quantity shipped by barge.
[3] An additional 3,654 tons was used by 2 producers as fuel at their plants in 1955 and 4,993 tons by 2 producers in 1956.

VALUE AND PRICE

The total value of briquet production in 1956 declined 4 percent from 1955 because of decreased production, but the percentage decrease in value was considerably lower than the percentage decrease in production because of higher raw-material and manufacturing costs. Average per ton raw-material costs, especially, were higher in 1956, with increases of 12 percent for raw fuels and 5 percent for binders.

The average value per ton, f. o. b. plant, for all briquets produced in the United States in 1956 was $12 (table 1). This was a 3-percent increase over 1955 and a 9-percent increase over the average for 1947–49. As in prior years, briquets in the Eastern States region had the lowest average value per ton f. o. b. plant, chiefly because of the proximity of plants to the anthracite and bituminous-coal fields, thereby eliminating excessive transportation charges. Briquets in the Central States region, where large quantities of anthracite and bituminous coal are also consumed, had the highest average value per ton f. o. b. plant, as most of the raw fuels were produced in other areas and their costs necessarily included higher transportation charges.

The values placed on raw materials by producers indicated that there are marked differences in costs in different sections of the country. For example, the average value placed on low-volatile bituminous coal by producers in Wisconsin was more than two times greater than that by producers in West Virginia, where this fuel is produced. The average value of binders, however, is highest in the Eastern States region because most of the production in this area comes from plants in West Virginia that are far removed from petroleum-refining centers.

Petroleum coke, used by 8 plants, had the highest unit value with an average of $8.94 per ton; lignite char, used by 1 plant, had the lowest unit value

FOREIGN TRADE [1]

Canada was the principal export market for United States briquets and received virtually all briquets exported in 1956. Liberia and Brazil each received small quantities, but their total was less than 1 percent of the total exports. Total exports in 1956 were slightly higher than in 1955 and amounted to 7 percent of production. Exports, like production, have been decreasing gradually and in 1956 slightly more than half as many briquets were exported as during the 1947–49 base period.

Only 318 tons of briquets valued at $3,507 was imported in 1956; all came from Canada.

Export data (table 9) on fuel briquets are compiled and published by the Bureau of the Census and include only those briquets made from coal and coke.

TECHNOLOGY

Briquetting technology advanced in 1956 with development of a cyclone atomizer [2] for briquet binders. This device is essentially a pneumatic cyclone nozzle for atomizing viscous briquet binder, such as molten asphalt, with the aid of superheated steam or hot compressed air. The atomizer consists primarily of a rotation chamber with one or more tangential inlets for steam or air and a central

[1] Figures on imports and exports compiled by Mae B. Price and Elsie D. Page, Division of Foreign Activities, Bureau of Mines, from records of the Bureau of the Census.

[2] Visman, J., Cyclone Atomizer for Briquet Binder: Canadian Dept. of Mines and Tech. Surveys, Tech. Paper 17, 1957, 14 pp.

aperture in the top and bottom walls through which a suction pipe extends downward to a position close to the bottom aperture, leaving an annular opening of adjustable width. The hot liquid binder is subjected to shearing stresses created by steam escaping through an annular opening of the atomizer and is disintegrated to a fine mist. The total surface area is the same as the surface area of the briquetting coal. Commercial tests showed that, by producing a more homogeneous mix than does the usual emulsifier, an increase in the compressive strength of briquets equivalent to the use of an additional 0.5 percent of asphalt resulted. This permits a reduction in asphalt for a given required briquet strength. In addition, atomizing asphalt improves the briquetting operation. Under normal operating conditions the moisture content of the mix may vary as a result of surges of wet coal entering the plant or because of a drop in steam pressure. This leads to clogging of the system and to changes in the level of the mix in the press hopper, resulting in underfeeding or overfeeding of the press. Atomizing of the binder appears to counteract the detrimental effects of moisture, thereby insuring smooth operation of the plant and more constant quality in the finished product.

TABLE 9.—Fuel briquets (coal and coke) exported from the United States, 1954–56, by countries of destination and customs district

[Bureau of the Census]

	1954		1955		1956	
	Net tons	Value	Net tons	Value	Net tons	Value
COUNTRY						
North America:						
Canada	96,221	$1,596,426	94,179	$1,454,304	107,122	$1,709,528
Honduras	----	----	25	594	----	----
Mexico	2,029	23,840	534	4,272	----	----
Total	98,250	1,620,266	94,738	1,459,170	107,122	1,709,528
South America:						
Argentina	----	----	50	1,980	----	----
Brazil	----	----	----	----	130	3,245
Chile	658	6,266	343	3,331	----	----
Total	658	6,266	393	5,311	130	3,245
Asia: Japan	----	----	11,163	99,666	----	----
Africa: Liberia	----	----	----	----	200	3,467
Grand total	98,908	1,626,532	106,294	1,564,147	107,452	1,716,240
CUSTOMS DISTRICT						
Buffalo	47,470	822,732	38,809	653,677		
Dakota	18,919	243,355	19,083	251,106		
Duluth and Superior	10,719	143,240	13,015	184,358		
Laredo	169	2,100	----	----		
Los Angeles	----	----	534	4,272		
Maine and New Hampshire	1,300	25,509	794	15,877		
Maryland	658	6,266	343	3,331		
Massachusetts	44	732	----	----		
Michigan	1,718	23,247	2,523	32,815	(1)	(1)
Minnesota	45	593	----	----		
New Orleans	----	----	25	594		
New York	----	----	50	1,980		
Ohio	----	----	45	283		
Rochester	----	----	2,062	15,918		
St. Lawrence	15,366	328,188	15,464	271,563		
Virginia	----	----	11,163	99,666		
Washington	----	----	34	717		
Other [2]	2,500	30,570	2,350	27,990		
Total	98,908	1,626,532	106,294	1,564,147	107,452	1,716,240

[1] Data not available.
[2] Estimated from sample data; district data not available.

The cyclone atomizer appears to meet the prime requisites of an atomizer suitable for commercial briquetting—namely, simplicity in design, high dispersion rate, large capacity, and low cost—and can be installed in any briquetting plant of conventional design.

A new method for manufacturing carbonized briquets [3] recently has been developed in England by the National Coal Board's Coal Research Establishment. Conventional methods of producing carbonized briquets from low-rank, high-volatile coals entail, in general, a modification of the coal or binder. One method of modifying the coal is by a pretreatment (before the briquetting stage), consisting of a partial carbonization at 400°–650° C. If briquets are manufactured by the conventional process, using pitch as a binder, the partly carbonized coal or char must be cooled to approximately 80° C. before briquetting, and the briquets further cooled to allow the pitch binder to set before handling. Therefore in subsequent carbonizing treatment above 650° C., the cold briquets must be reheated through this temperature range.

If briquets are strong enough at or near the temperature at which they are compressed, they can be carbonized immediately, and the heat loss involved in cooling and reheating is avoided. Experimental work has demonstrated that chars can be made into briquets of adequate strength at 400°–440° C. by utilizing properly modified coals and binders of coal and pitch. These briquets are strong enough for carbonizing while still hot, and it is estimated that 50 percent of the total heat input for briquetting by the conventional process can be saved when the hot-briquetting method is used.

A new method for briquetting coal without a binder [4] also has been developed by the Coal Research Establishment of the National Coal Board. This process permits coal to be briquetted without a binder and with only moderate compacting pressures and moderately fine grinding. Prior attempts to devise such a process have, in general, been impracticable, for most methods involved the use of high pressures and very fine grinding and were very expensive. The new method, known as the "Shape" process, introduces angular shear strain in the mass of coal particles while they are under compressive load. The effect of this shear is to cause relative movement of adjacent particles under load, so that their surfaces are brought into more intimate contact by plastic deformation. The "Shape" process can be applied to both low- and high-rank coals, with the exception of the lowest volatile anthracites, which have been shown not to have the necessary inherent plasticity under load.

A new type of igniting material for briquets [5] has been developed in Japan. It is manufactured by immersing the residue of sweet potatoes, from which starch has been extracted, in concentrated nitric acid and then in concentrated sulfuric acid. The material is then washed with water, mixed with charcoal powder and a binder, and molded alone or mixed with briquet material.

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[3] Chenoweth, J. G., and Mills, E. P., The Hot Briquetting of Devolatilized Coal for Carbonization: Nat. Coal Board, Stoke Orchard, England, Coal Research Establishment Rept. 1290, October 1956, 33 pp.

[4] National Coal Board Coal Research Establishment, "Shape" Process of Briquetting, Summary of Research Work 1955 and 1956: Stoke Orchard, England, pp. 17–19.

[5] Chemical Abstracts, Igniting Material for Briquets: Vol. 50, No. 18, Sept. 25, 1956, p. 13410.

PACKAGED FUEL

CAPACITY

The annual productive capacity of the packaged-fuel industry decreased 12 percent in 1956, when 5 plants with a total annual capacity of 23,800 net tons ceased operations. Twenty-six plants produced packaged fuel in 1956, compared with 31 plants in 1955. Packaged-fuel plants are generally small, and 18 of the active plants had a rated capacity of less than 5,000 tons. The total annual capacity for the industry in 1956 was 174,600 net tons.

TABLE 10.—Annual capacity and production of packaged-fuel plants in the United States, 1952–56

	Active plants	Annual capacity (net tons)	Production	
			Net tons	Percent of annual capacity
1952	43	358,858	96,267	26.8
1953	37	232,850	79,732	34.2
1954	37	243,300	77,360	31.8
1955	31	198,400	69,212	34.9
1956:				
Plants with capacity of—				
Less than 5,000 tons	18	40,300	10,081	25.0
5,000 to less than 10,000 tons	4	26,300	5,572	21.2
10,000 to less than 15,000 tons	1			
15,000 to less than 25,000 tons	2	[1] 108,000	[1] 49,307	45.7
25,000 or more tons	1			
Total	26	174,600	64,960	37.2
Plants with production of—				
Less than 1,000 tons	17	39,300	7,807	19.9
1,000 to less than 3,000 tons	5	27,300	7,846	28.7
3,000 to less than 5,000 tons	1			
5,000 to less than 10,000 tons	1	[1] 108,000	[1] 49,307	45.7
10,000 or more tons	2			
Total	26	174,600	64,960	37.2

[1] Combined to avoid disclosing individual company figures.

PRODUCTION

The demand for packaged fuel continued to decline in 1956, and production decreased 6 percent. However, in terms of annual capacity, the plants in operation in 1956 produced at the highest rate since 1951. The rate of production for the industry averaged 37.2 percent of capacity, or 2.3 points higher than in 1955. Production increased in Indiana and Michigan in 1956, as 1 plant reopened in Indiana and 2 plants in Michigan increased their output. Michigan had the greatest production, with 51 percent of the total, Wisconsin ranked second. Indiana, Ohio, and Minnesota followed; and their production, combined with that of Michigan and Wisconsin, equaled 97 percent of the total. Like fuel briquets, production of packaged fuel is seasonal, with top production during the winter months and little or none between May and September. Monthly output ranged from 9,937 tons in January to 448 tons in July.

Raw Fuels.—Low-volatile bituminous coal was used almost exclusively in manufacturing packaged fuel in 1956. Small quantities of high-volatile bituminous coal, semianthracite, and petroleum coke were also used, but the quantity consumed was only 6 percent of the total. Twenty plants used yard screenings as a raw material, but yard screenings composed the smaller portion of the raw fuels used. Over 80 percent of the total raw fuels came from other sources and consisted mainly of coal fines that were screened at mines or accumulated at loading and unloading points. Twenty-one plants in 7 States used low-volatile bituminous coal exclusively.

Binders.—Except for one plant that used asphalt, starch was the binding material employed in manufacturing packaged fuel in 1956. Though more expensive than petroleum asphalt, starch is the preferred binding material in the packaged-fuel industry because it apparently makes a strong block and does not add ash or volatile matter to the product. In 1956 approximately 10 pounds of starch (value—$0.67) per ton of raw fuel was used by the plants that employed starch as a binder. In comparison, 153 pounds of asphalt (value—$1.96) per ton of raw fuel was used for fuel briquets. Starches used as packaged-fuel binder are generally corn or wheat flour obtained from cereal mills.

TABLE 11.—Production and value of packaged fuel in the United States, 1955–56, by States

State	1955				1956			
	Active plants	Production (net tons)	Value		Active plants	Production (net tons)	Value	
			Total	Average			Total	Average
Indiana	2	(1)	(1)	(1)	3	8,674	$194,670	$22.44
Michigan	8	31,725	$504,288	$15.90	7	33,359	733,027	21.97
Minnesota	3	3,594	85,369	23.75	2	(1)	(1)	(1)
Ohio	11	10,420	155,259	14.90	9	7,358	104,599	14.22
Other States [2]	7	23,473	449,129	19.13	5	15,569	349,584	22.45
Total	31	69,212	1,194,045	17.25	26	64,960	1,381,880	21.27

[1] Combined with "Other States" to avoid disclosing individual company figures.
[2] Comprises 2 plants in Illinois and 1 plant each in Iowa, Virginia, and Wisconsin.

TABLE 12.—Production of packaged fuel in the United States in 1956, by months

Month	Net tons	Month	Net tons	Month	Net tons
January	9,937	May	3,971	September	4,539
February	8,781	June	1,031	October	6,076
March	8,242	July	448	November	6,392
April	6,377	August	2,337	December	6,829

TABLE 13.—Raw fuels used in making packaged fuel in the United States in 1956

Type	Number of plants	Used		
		Net tons	Value	
			Total	Average
Bituminous coal:				
Low-volatile	22	60,553	$629,910	$10.40
High-volatile	2	[1] 3,736	[1] 38,936	10.42
Semianthracite	1			
Petroleum coke	2			
Total	[2] 26	64,289	668,846	10.40

[1] Combined to avoid disclosing individual company figures.
[2] Some plants used more than 1 type of raw fuel; hence, the sum of the plants exceeds the total shown.

TABLE 14.—Quantity and value of raw materials used in making packaged fuel in the United States and quantity and value of sales in 1956, by regions

Region [1]	Raw materials used: Fuels: Net tons	Fuels: Value: Total	Fuels: Value: Average	Binders: Net tons	Binders: Value: Total	Binders: Value: Average
Eastern States	8, 145	$63, 725	$7. 82	58	$6, 985	$120. 43
Central States	52, 850	562, 545	10. 64	692	37, 117	53. 64
Western States	3, 294	42, 576	12. 93	28	3, 671	131. 11
Total	64, 289	668, 846	10. 40	778	47, 773	61. 40

Region [1]	Total: Net tons	Total: Value: Total	Total: Value: Average	Packaged fuel sold: Net tons	Packaged fuel sold: Value: Total	Packaged fuel sold: Value: Average
Eastern States	8, 203	$70, 710	$8. 62	8, 155	$122, 133	$14. 98
Central States	53, 542	599, 662	11. 20	51, 946	1, 143, 455	22. 01
Western States	3, 322	46, 247	13. 92	3, 314	81, 906	24. 72
Total	65, 067	716, 619	11. 01	63, 415	1, 347, 494	21. 25

[1] Eastern States include Ohio and Virginia; Central States—Illinois, Indiana, Michigan, and Wisconsin; Western States (west of the Mississippi River)—Iowa and Minnesota.

SHIPMENTS

Because packaged fuel breaks easily and deteriorates when exposed to the weather, it is usually consumed locally. All shipments were by truck in 1956, with 82 percent delivered locally. No packaged fuel has been shipped by rail since 1953. Eighteen percent of the total shipments were reported as sent to other than local destinations. Although complete data on these shipments are not available, it may be assumed that this packaged fuel was consumed within the producing State or in nearby States. Some packaged fuel is sold in vending machines.

No packaged fuel is imported or exported.

TABLE 15.—Shipments of packaged fuel in the United States, 1952–56, by methods of transportation, in net tons

Year	Shipped by truck: Local sales	Shipped by truck: Other than local sales	Shipped by truck: Total	Shipped by rail	Total
1952	76, 874	9, 698	86, 572	6, 864	93, 436
1953	68, 275	8, 254	76, 529	3, 582	80, 111
1954	78, 464		78, 464		78, 464
1955	57, 051	12, 159	69, 210		69, 210
1956	51, 933	11, 482	63, 415		63, 415

VALUE

Although the quantity of packaged fuel manufactured in 1956 declined 6 percent, the total value of production, f. o. b. plants, increased 16 percent. This was an increase of 23 percent in average value per ton, caused principally by higher manufacturing costs, as well as by a 10-percent increase in the average value of raw materials. Both raw fuels and binders had a higher value in 1956 than in 1955, with increases in average values per ton of 11 percent for raw fuels and 24 percent for binders.

The average values for packaged fuel are always considerably higher than for fuel briquets because of higher manufacturing costs and different marketing methods. Packaged-fuel plants are generally much smaller than briquet plants, and packaged fuel usually is sold in small quantities by the producers. In most instances, values assigned include profits as well as raw material and manufacturing costs and are the equivalent of retail prices.

WORLD REVIEW

The estimated world production of fuel briquets and packaged fuel in 1956 was 118.4 million tons. As in previous years, production was greatest in Europe, where vast amounts of low-grade coals were converted into briquets because they could not be utilized efficiently in their raw state. East Germany, in particular, manufactured large quantities of briquets from brown coal and in 1956 produced almost half of the total world production. West Germany, also a large producer of briquets, produced 23 percent of the world total in 1956. Briquetting was practiced on a large scale in Germany for many years, and briquets have been used extensively for residential heating and cooking, for railroad fuel, and for electric-power generation. The Soviet Republic had an estimated briquet production of 9.4 million tons in 1956, which placed it second in world production, with 8 percent of the total. France produced 8.7 million tons of briquets, placing it third in world production, with 7 percent of the total. Although briquets are produced in 17 other European countries, 91 percent of the briquets manufactured in Europe were produced in Germany, France, and the U. S. S. R. The United States produced slightly more than 1 percent of all briquets and ranked eighth in world production.

Briquetting serves a somewhat different purpose in the United States than in most other countries, notably Europe. Wheras in Europe the briquetting process is primarily a means of utilizing low-grade coals, briquetting in the United States is basically a salvaging process that transforms valuable, but unmarketable, fine materials into a product that can be transported and utilized efficiently.

TABLE 16.—World production of fuel briquets and packaged fuel, 1952–56, by countries, in thousand net tons [1]

Country	1952	1953	1954	1955	1956
North America:					
Canada	711	708	831	654	[2] 650
United States:					
Briquets	2,280	1,780	1,624	1,630	1,519
Packaged fuel	96	80	77	69	65
Total	3,087	2,568	2,532	2,353	2,234
Europe:					
Austria	55	19	9	[2] 11	[2] 8
Belgium	1,635	1,469	1,519	1,701	2,006
Bulgaria [2]	250	250	250	250	255
Czechoslovakia: [2]					
Bituminous	440	440	450	455	455
Lignite	470	470	495	495	500
Denmark [3]	97	86	97	91	[2] 94
Finland (capacity) [2]	88	88	88	88	88
France	8,784	7,671	7,422	7,383	8,673
Germany:					
East, lignite	48,061	50,376	51,698	56,218	[2] 56,900
West:					
Bituminous	5,906	5,783	6,647	7,621	8,498
Lignite	18,081	18,275	18,372	18,123	18,691
Hungary [2]	175	195	220	220	204
Ireland [3]	35	40	40	39	[2] 55
Italy, anthracite	----------	----------	24	[2] 29	[2] 28
Netherlands:					
Bituminous	1,041	996	1,012	1,076	1,139
Lignite	80	93	90	94	86
Poland: [2]					
Bituminous	700	700	745	770	770
Lignite	180	185	160	200	205
Portugal	104	91	100	106	112
Rumania [2]	285	285	285	285	285
Spain	1,265	1,283	1,226	1,303	1,431
Sweden [3]	84	67	60	77	[2] 77
Switzerland [2]	110	110	110	110	110
U. S. S. R. [2] [3]	8,000	9,300	9,400	9,400	9,400
United Kingdom	1,990	1,765	1,884	1,887	1,990
Yugoslavia:					
Bituminous	18	[2] 18	[2] 22	28	----------
Lignite [2]	195	195	200	200	----------
Total	98,100	100,300	102,600	108,300	112,100
Asia:					
Indochina (Vietnam)	77	51	55	[2] 55	[2] 55
Indonesia	42	37	37	37	25
Japan	1,882	2,281	2,724	2,905	[2] 2,975
Korea, Republic of	52	52	46	101	129
Pakistan [2]	11	13	13	13	13
Turkey	41	88	99	104	[2] 105
Total	2,105	2,522	2,974	3,215	3,302
Africa:					
Algeria	57	45	32	26	----------
French Morocco	18	20	17	4	[2] 18
Tunisia	17	13	8	[2] 9	[2] 9
Total	92	78	57	39	27
Oceania:					
Australia	627	627	688	712	692
New Zealand	12	13	14	14	18
Total	639	640	702	726	710
World total [2]	104,000	106,100	108,900	114,600	118,400

[1] Includes revisions of data published previously. Data do not add to totals shown owing to rounding.
[2] Estimated.
[3] Includes peat briquets.

Peat

By Eugene T. Sheridan and Maxine M. Otero

Contents

GENERAL SUMMARY

More peat was consumed in the United States in 1956 than in any prior year. This resulted in increases in both production and imports—7 percent and 8 percent, respectively, higher than in 1955. Production, which has increased each year since 1949, amounted to 292,097 net tons valued at $2,459,895. This was over twice the average production for 1947–49. Imports in 1956 were 15 percent less than domestic production and totaled 247,689 net tons valued at $10,530,439. Although imports decreased slightly in 1955, they increased substantially in 1956, and more peat was imported in 1956 than in any preceding year.

Peat is used chiefly for soil-improvement purposes in the United States, and the greater part of production goes for constructing lawns, improving garden soils, and cultivating and growing plant life. Smaller amounts are used in preparing mixed fertilizers and for a variety of other purposes. Although peat has been used as a fuel in Europe for centuries, none is used for heat or energy in the United States, as the availability of an ample supply of high-grade fuels has deterred the development of large-scale mechanized equipment for peat winning and processing.

For the purpose of collecting and compiling data presented in this chapter, peat has been classified into three general types—moss peat, reed-sedge peat, and peat humus. Peats that do not fall into one of these categories are designated "other types." Moss peat is composed primarily of the poorly or moderately decomposed remains of several species of sphagnum, hypnum, and/or other mosses and is normally

TABLE 1.—Salient statistics of the peat industry in the United States, 1947–49 (average) and 1953–56

	1947–49 (average)	1953	1954	1955	1956
Number of operations	45	68	85	82	75
Production, net tons	131,782	204,209	244,163	273,669	292,097
Imports, do	88,462	199,887	240,940	229,310	247,689
Apparent consumption, do	220,244	404,096	485,103	502,979	539,786
Value of production	$939,518	$1,617,947	$2,257,591	$2,282,865	$2,459,895
Average per net ton	$7.13	$7.92	$9.25	$8.34	$8.42
World production, net tons	50,000,000	[1] 51,430,000	[1] 57,600,000	[1] 65,580,000	58,340,000

[1] Revised figure.

acid in reaction. Reed-sedge peat is formed chiefly from poorly or moderately decomposed reeds, sedges, rushes, grasses, and other swamp plants and is normally slightly acid, neutral, or alkaline in reaction. Humus is peat so decomposed that its biological identity is lost; it is fine grained in texture and is formed when deposits are exposed to periods of prolonged dryness.

Seventy-five companies in 17 States reported commercial production of peat in 1956. Florida ranked first in production; Washington, second; and Michigan, third.

By far, the greater part of peat produced in the United States is sold in bulk. This is in contrast to imported peat, which is marketed almost entirely in packaged form.

GOVERNMENT REGULATIONS

No national standards have as yet been established for grading peat, chiefly because the chemical and physical properties are so varied and the industry is so small. Trade-practice rules have been established, however, which were designed to foster and promote fair competitive practices for protecting the industry and the public. These rules, which were established by the Federal Trade Commission in 1950, contain provisions designed to prohibit specific kinds of misrepresentations and the deceptive use of trade or corporate names. One section of the rules defines the requirements for labeling a product as peat and for labeling different types. Peat is defined as partly decomposed vegetable matter that has accumulated under water or in a water-saturated environment. A product cannot be labeled "peat" unless 75 percent of its composition, on a dry basis, is peat, with the remainder consisting of normally associated soil materials. In order that a product may be labeled "peat moss" or "moss peat," 75 percent of its composition must have been derived from sphagnum, hypnum, mnium, and other mosses, the remainder consisting of associated soil materials. A product, however, may also be labeled "peat moss" (though not so qualified) if it fulfills the requirements for the term "peat" and states, in immediate conjunction, the kind or kinds of peat of which the product is composed. Under this provision reed-sedge peat may be labeled "peat moss reed-sedge."

Federal specifications have been issued by the Bureau of Federal Supply, United States Department of the Treasury, for all United States Government agencies that purchase peat. Federal Specification Q–P–166 (sec. IV, pt. 5, of the Federal Standard Stock Catalog) divides peat into types and classes and lists general and detailed requirements for each type and class. It also provides other pertinent information, such as sampling, inspection and testing procedures, and packaging and marketing requirements.

SCOPE OF REPORT

All statistical data presented in this chapter, unless otherwise specified, were submitted voluntarily to the Bureau of Mines by United States peat producers.

Complete coverage of the industry was attempted; but, in all probability, there were a few small producers who operated intermittently and were uncanvassed or failed to submit reports. However, the data obtained represent almost complete coverage of all commercial producers. Mailing lists are kept current by requesting companies to furnish names and addresses of new producers in their areas and individual State mineral and commodity production reports are periodically checked.

The unit of measurement in this chapter is the net ton of 2,000 pounds and all quantities of peat shown are on an air-dried basis. No adjustment has been made for moisture content.

The Bureau of Mines has made a continuous annual canvass of the peat industry since 1934, when it resumed the survey formerly conducted by the Federal Geological Survey from 1908 to 1926. Economic and statistical data are normally collected on the location of operations, size of deposits, production by types, methods of operation, quantity and value of bulk and packaged sales, and major uses of peat. No information is collected on stocks, since producers normally do not stock peat. However, a difference of 6,595 net tons between reported production and sales indicates that all peat was not sold in the year in which it was produced.

In the section entitled "Consumption and Uses," data on sales by uses include only peat that is produced in the United States, since no information is available on the ultimate uses of imported peat; however, figures on apparent consumption also include imports, and apparent consumption is considered equivalent to production plus imports, since no peat is exported and only minor quantities are stocked.

In the section "Value and Price," production and value of sales are based upon producers' selling prices at the plant, exclusive of containers.

RESERVES

Known peat lands in the United States contain an estimated 13.8 billion tons [1] of air-dried peat, according to field investigations conducted by the Federal Geological Survey in 1909 and 1922. These reserves are almost wholly intact at present, for, since 1922, only slightly more than 3 million tons or less than 0.25 percent of the total has been consumed.

Peat occurs in 30 States, but about two-thirds of the total is found in 2 States—Minnesota and Wisconsin. Minnesota contains the largest reserves, with about 6.8 billion tons, covering about one-tenth of the total land area of the State. Wisconsin has the second largest reserves, with approximately 1 million acres capable of yielding 2.5 billion tons. Florida ranks third, with about 2 billion tons.

The Minnesota and Wisconsin deposits occur chiefly in basins of glacial origin and generally have been formed by accumulation of plant remains in former lakes and ponds. Most of these deposits are in wooded swamps and consist of a well-decomposed underlayer of fine-grained peat overlain with a slightly decomposed, fibrous layer of built-up peat. Sphagnum mosses have contributed heavily to this top layer, and large quantities of sphagnum-moss peat are found in the muskeg and tamarack swamps of northern Minnesota and Wisconsin.

The northern peninsula of Michigan contains extensive deposits of peat that are similar, in most respects, to those in Minnesota and Wisconsin. The deposits in Michigan were formed largely in "mus-

[1] Soper, E. K., and Osbon, C. C., The Occurrence and Uses of Peat in the United States: Geol. Survey Bull. 728, 1922, p. 92.

kegs" and grass-sedge marshes and contain brown and fibrous peat, consisting chiefly of remains of grasses and sedges.

Peat deposits occur in all of the New England States; the largest are in Maine and Massachusetts. Most of these deposits are of the filled-basin type and contain soft, well-decomposed peat covered with brown, fibrous, moss peat. In eastern Maine rather extensive areas of sphagnum-moss peat occur. Unlike most deposits of moss peat in the United States, which have accumulated on top of peat formed from other types of vegetation, these deposits are the result of a gradual buildup of plant materials on relatively flat or gently sloping land surfaces. Sphagnum mosses, heath shrubs, and associated coniferous trees are the predominant plants in this area, and peat in these bogs is relatively homogeneous in character.

The New York deposits are numerous and widely distributed but vary greatly in the type of peat they contain and in the manner in which they were formed. The largest areas occur in the west-central and southeastern parts of the State.

Peat reserves in New Jersey are relatively small; most of the deposits were formed in lakes or ponds from the remains of grasses, sedges, cattails, and other plants that grow in undrained areas.

Deposits in Pennsylvania, Ohio, Indiana, Illinois, and Iowa are somewhat similar, as most were formed in glacial basins and consist chiefly of the remains of grasses, reeds, sedges, and certain mosses. Very little sphagnum-moss peat is found in this area.

Peat areas in the Atlantic coast region include southern Delaware, the eastern parts of Maryland, Virginia, North Carolina, South Carolina, and Georgia and all of Florida. Deposits in these States generally occur in undrained valleys and lagoons on the coast and on flat, imperfectly drained areas farther inland. This region is characterized by many salt- and fresh-water marshes and swamps, and the deposits were formed largely from trees, sedges, and marsh grasses. Florida contains the largest deposits in this region, with peat distributed over almost the entire State.

TABLE 2.—Known original reserves of peat in the United States, estimated on an air-dried basis, by regions and States, in thousand net tons [1]

Region and State	Reserves	Region and State	Reserves
Northern region:		Atlantic coast region:	
Minnesota	6,835,000	Virginia and North Carolina	700,000
Wisconsin	2,500,000	Florida	2,000,000
Michigan	1,000,000	Other States [2]	2,000
Iowa	22,000		
Illinois	10,000	Total	2,702,000
Indiana	13,000		
Ohio	50,000	Other regions:	
Pennsylvania	1,000	Gulf Coast [3]	2,000
New York	480,000	California	72,000
New Jersey	15,000	Oregon and Washington	1,000
Maine	100,000		
New Hampshire	1,000	Total	75,000
Vermont	8,000		
Massachusetts	12,000		
Connecticut	2,000		
Rhode Island	1,000		
Total	11,050,000	Total all regions	13,827,000

[1] Geological Survey, Coal Resources of the United States (Progress Report): Circ. 293, Oct. 1, 1953, p. 38.
[2] Includes Delaware, Maryland, South Carolina, and Georgia.
[3] Exclusive of Florida.

Peat also occurs in a narrow belt of land along the coast of Alabama, Mississippi, Louisiana, and Texas and in several counties in northern and central California. Most peat in California is found in marshes and in the lower valleys of rivers and was formed principally from aquatic plants. Numerous small deposits occur in the west-central and southwestern parts of Washington.

PRODUCTION

Peat-production methods in the United States are relatively simple, but procedures and equipment vary greatly. No one method of production is suitable for all peat lands. Although some peat is still excavated by hand, virtually all operations are mechanized to some extent and generally employ machinery devised by individual operators to meet their particular needs. In general, conventional types of excavating and earth-moving machinery, with some modifications, are employed for excavating, while hammermills and modified grinding and pulverizing equipment are used for shredding.

An attempt was made in 1956 to determine to what extent peat operations are mechanized in the United States and also the types of production equipment that are normally employed. Although 7 operators, representing 12 percent of the total production, failed to list any equipment or state their methods of production, it was learned that most operators excavated and loaded peat by power shovels, draglines, and front-end loaders. Smaller amounts were produced by using bulldozers, cranes equipped with clamshell buckets, clamshell dredges, and York-rake-type equipment. Only 4 reporting companies, with less than 3 percent of the production, excavated peat manually.

Although there were seven fewer producing companies than in 1955, production increased more than 18,000 tons in 1956, principally in Connecticut and Illinois. Florida had the highest production, with 20 percent of the total; Washington was second, with 13 percent; and Michigan was third, with 11 percent. Production in each of these three States was about equal to that in 1955. Washington had the largest number of producing companies, with 12, and Florida and Ohio each had 11. Although ranking third on a weight basis, the total value of production in Michigan was higher than in any other producing State.

About one-fourth of the total output was raw peat, with no preparation other than having been air-dried. The remainder consisted of processed peat prepared for use by cultivation, shredding, or kiln drying. About one-third of the prepared peat was cultivated. Cultivation requires turning over the surface of a deposit at intervals for a period of time—a process that aerates and gradually decomposes peat. About three-fifths of all peat produced was shredded. Only about 5 percent was kiln-dried; all of this was used in preparing mixed fertilizers. Fifty-five percent of the total production was reported as peat humus, 30 percent as reed-sedge peat, and 15 percent as moss peat. A negligible amount was reported as "other."

Domestic production, imports, and available supply of peat in the United States since 1940 are presented graphically in figure 1.

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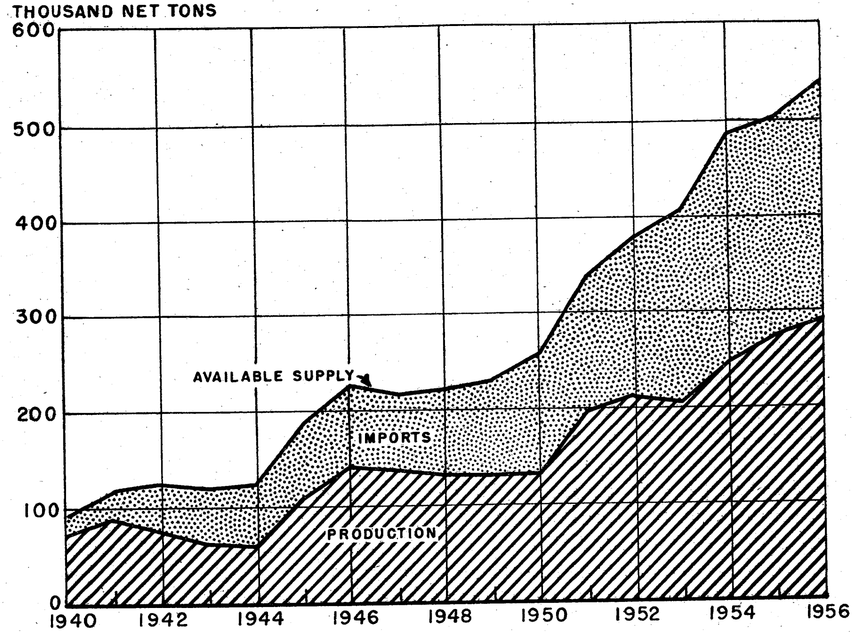

FIGURE 1.—Production, imports, and available supply of peat in the United States, 1940–56.

TABLE 3.—Peat produced in the United States, 1954–56, by States

State	1954		1955		1956	
	Net tons	Value	Net tons	Value	Net tons	Value
California	(1)	(1)	19,947	(2)	18,918	$214,735
Colorado	(1)	(1)	--	--	--	--
Connecticut	(1)	(1)	4,829	$24,106	22,315	152,450
Florida	37,449	$168,004	61,098	231,829	58,496	203,034
Georgia	(1)	(1)	5,554	(2)	6,225	47,843
Idaho	(1)	(1)	260	(2)	--	--
Illinois	(1)	(1)	(2)	(2)	14,451	157,573
Indiana	(1)	(1)	9,053	49,924	11,383	78,594
Iowa	(1)	(1)	(2)	(2)	27,375	(2)
Maine	(1)	(1)	4,670	179,544	(2)	(2)
Massachusetts	(1)	(1)	572	(2)	300	(2)
Michigan	(1)	(1)	29,743	(2)	31,111	474,899
Minnesota	(1)	(1)	50	(2)	100	(2)
New Hampshire	(1)	(1)	45	(2)	320	(2)
New Jersey	(1)	(1)	26,358	229,065	(2)	(2)
New York	(1)	(1)	5,622	51,740	2,900	23,244
Ohio	29,540	356,970	22,484	249,427	15,509	174,469
Pennsylvania	15,621	141,352	23,277	219,628	20,498	213,509
Texas	(1)	(1)	--	--	--	--
Washington	43,134	153,058	37,640	113,254	37,043	128,964
Wisconsin	(1)	(1)	--	--	--	--
Undistributed	118,419	1,438,207	22,467	934,348	25,153	590,581
Total	244,163	2,257,591	273,669	2,282,865	292,097	2,459,895

[1] Included with "Undistributed" to conform to the Bureau of the Census method of concealment by regional groupings.
[2] Included with "Undistributed" to avoid disclosing individual company figures.

TABLE 4.—Peat produced in the United States in 1956, by kinds, in net tons

Kind	Total		Raw	Prepared	Type of preparation		
	Quantity	Value			Cultivated	Shredded	Kiln-dried
Moss	43,640	$550,877	11,236	32,404		27,690	4,714
Reed-sedge	88,328	999,894	10,237	78,091	53,270	75,271	
Humus	159,769	907,684	55,499	104,270	20,172	73,688	10,410
Other	360	1,440	360				
Total	292,097	2,459,895	77,332	214,765	73,442	[1] 176,649	15,124

[1] Includes 50,450 tons of cultivated peat which was further processed by shredding.

CONSUMPTION AND USES

The apparent consumption of peat in 1956 increased 7 percent over 1955. As in former years, imports figured prominently in the consumption pattern and consumption in 1956 was nearly twice as large as domestic production.

Peat consumption in the United States has more than doubled since the end of World War II. Expanding markets in horticulture and agriculture, influenced to a great extent by inadequate supplies of animal manures, were the chief causes for this increased use of peat. Factors probably contributing to expanded markets were the tremendous home-building programs that followed World War II and a growing trend toward suburban living, where much emphasis has been placed on the cultivation of lawns and home gardens.

Most of the peat was utilized for soil-improvement purposes; and, although exact data are not available on specific end uses, it is known that most peat is consumed for constructing lawns, improving garden soils, and growing of plant life. Peat is also widely used in greenhouses and at nurseries to germinate seeds, to start cuttings, and to surface-mulch evergreen trees and shrubs. The benefits derived from the use of peat result largely from improved physical conditions in the soil; peat changes structural characteristics and improves soil texture and water-holding properties. Although peat has a relatively high nitrogen content, it cannot be used as a fertilizer, as most of the nitrogen is in the form of complex compounds and usually is slowly available to plants. Eighty-seven percent of the domestic peat sold in 1956 was marketed for soil-improvement purposes.

Because of its moisture-absorbing properties, peat is sometimes added to mixed fertilizers to reduce stickiness and caking. Peat also acts as a filler to complete the fertilizer formula. This practice has declined, however, in recent years owing to a process known as pelletizing, which eliminates the need for a conditioning agent. Six percent of the domestic peat sales in 1956 was used in mixed fertilizers, and a small amount was employed for a variety of other purposes. Some peat was added to chicken manure which was used for fertilizer, and small amounts were used by fish-bait dealers for storing earthworms. Slightly decomposed moss and reed-sedge peats were used for packing roses and other plants for shipment, and some peat or peat-soil mixtures were marketed in small bags as potting soils for household plants. A small amount of peat was used as a seed inoculant and for mushroom beds, and some peat was employed for curing concrete in highway construction. Seven percent of the total sales in 1956 went for miscellaneous uses.

TABLE 5.—Peat sold in the United States in 1956, by uses

Use	In bulk			In packages			Total		
	Net tons	Value		Net tons	Value		Net tons	Value	
		Total	Average		Total	Average		Total	Average
Soil improvement	229,326	$1,617,431	$7.05	19,781	$435,902	$22.04	249,107	$2,053,333	$8.24
Mixed fertilizers	15,978	136,024	8.51				15,978	136,024	8.51
Other	18,125	133,409	7.36	2,292	82,420	35.96	20,417	215,829	10.57
Total	263,429	1,886,864	7.16	22,073	518,322	23.48	285,502	2,405,186	8.42

VALUE AND PRICE

The total value of all peat produced in 1956 was 8 percent greater than in 1955, with the average value per ton increasing $0.08. The gain in total dollar value, however, was due largely to increased production.

Table 6 lists average values per ton for production, by types, and average values per ton for sales, by uses. Moss peat had the highest value, reed-sedge peat was second, and humus was third. Peat sold for "other uses" had the highest sales value, that used in mixed fertilizers was second, while sales for general soil-improvement purposes ranked third. These figures are inconclusive, however, for average values were computed from total sales value for each type of peat, with no regard to the amount of preparation and processing that a particular type has undergone. Generally, any type of peat that is prepared and packaged has a much higher value than unprepared bulk peat.

The average values of bulk and packaged sales increased 10 and 13 percent, respectively, in 1956. Although less packaged peat was sold than in 1955, the average value per ton was higher in 1956 due to increased values for the quantity sold for "other uses," principally as seed inoculants.

As table 7 shows, imported peat had an average value per ton more than five times greater than domestic peat. This difference exists, however, because most imported peat is packaged or sold in bales and is marketed through normal retail channels, whereas most domestic peat is sold in bulk and, to a great extent, in the areas where it is produced. Also, values on domestic peats are reported at the primary producing level, f. o. b. plant, while values on imported peats are established at the port of embarkation and are equivalent to prices paid by importers, less the cost of transportation and miscellaneous charges. Actually, on a retail level the prices of foreign and domestic packaged peats of comparable quality are essentially competitive.

TABLE 6.—Average value per ton of peat produced, by types, and sold, by uses, 1947–49 (average) and 1952–56

Year	Average value per ton produced			Average value per ton sold		
	Moss [1]	Reed-sedge [1]	Humus	Soil improvement	Mixed fertilizers	Other uses
1947–49 (average)	$12.20	$7.64	$6.86	$6.33	$9.13	$7.43
1952	10.38	9.92	7.15	7.47	10.57	8.74
1953	11.87	8.82	6.65	7.36	10.89	12.97
1954	10.22	13.38	7.23	8.69	9.93	35.49
1955	7.98	11.66	6.33	8.05	10.44	9.38
1956	12.55	11.32	5.68	8.24	8.51	10.57

[1] Includes value of "other types" of peat.

FOREIGN TRADE [2]

Peat imports in 1956 were 8 percent greater than in 1955 and nearly 3 times greater than average imports for 1947–49. Canada and West Germany were the principal exporters of peat to the United States, with each supplying 48 percent of the total.

All imported peat was of the "moss-peat" type and was classified by the Bureau of the Census into two grades: (1) Fertilizer grade and (2) poultry and stable grade. Approximately 94 percent of the peat imported was fertilizer grade. This peat entered the United States duty free but a duty of $0.25 per ton was levied on all imported peat of poultry and stable grade.

The Canadian peat industry has developed almost entirely since 1940 and virtually all peat produced in Canada at present is exported to the United States. The greater part of this peat is produced in British Columbia and enters the United States through the Washington customs district. Substantial amounts of Canadian peat come into the United States, also, through the Michigan, Buffalo, and Vermont customs districts. Most Canadian peat is packaged in 100- to 150-pound bales or 100-pound fiberboard containers and is generally available in 3 types: (1) Coarse for use as stable litter, (2) medium for poultry and small-animal litter, and (3) fine for soil conditioning or packing and insulation. Imports of Canadian peat increased 15 percent over 1955.

Most European peat enters the United States through the east coast ports of New York, Philadelphia, and Baltimore and is distributed from eastern markets. German imports were slightly higher than in 1955.

Little, if any, peat is exported from the United States.

[2] Figures on imports compiled by Mae B. Price and Elsie D. Page, Division of Foreign Activities, Bureau of Mines, from records of the Bureau of the Census.

TABLE 7.—Peat moss imported for consumption in the United States, 1954–56, by kinds and by countries

[Bureau of the Census]

Country	Poultry and stable grade: Net tons	Poultry and stable grade: Value	Fertilizer grade: Net tons	Fertilizer grade: Value	Total: Net tons	Total: Value
1954						
North America: Canada	10,321	$623,895	80,028	$3,739,524	90,349	$4,363,419
Europe:						
Germany, West	9,640	294,130	130,956	3,830,626	140,596	4,124,756
Ireland			865	29,350	865	29,350
Netherlands	211	7,341	8,712	305,428	8,923	312,769
Sweden			70	1,536	70	1,536
United Kingdom			137	4,495	137	4,495
Total	9,851	301,471	140,740	4,171,435	150,591	4,472,906
Grand total	20,172	[1] 925,366	220,768	[1] 7,910,959	240,940	[1] 8,836,325
1955						
North America: Canada	6,661	419,745	97,323	4,841,882	103,984	5,261,627
Europe:						
Denmark			280	13,488	280	13,488
Finland			50	1,372	50	1,372
Germany, West	4,882	154,210	112,873	3,530,749	117,755	3,684,959
Ireland			166	5,991	166	5,991
Netherlands	111	4,348	6,923	288,665	7,034	293,013
Sweden			9	381	9	381
United Kingdom	32	989			32	989
Total	5,025	159,547	120,301	3,840,646	125,326	4,000,193
Grand total	11,686	[1] 579,292	217,624	[1] 8,682,528	229,310	[1] 9,261,820
1956						
North America:						
Canada	7,334	513,525	111,761	5,576,429	119,095	6,089,954
Mexico	136	11,951			136	11,951
Total	7,470	525,476	111,761	5,576,429	119,231	6,101,905
Europe:						
Denmark			2,426	97,184	2,426	97,184
Finland			93	3,995	93	3,995
Germany, West	6,167	203,821	111,844	3,798,795	118,011	4,002,616
Netherlands	226	9,923	5,476	209,041	5,702	218,964
Poland and Danzig			530	14,504	530	14,504
Sweden	414	18,889	1,109	60,473	1,523	79,362
United Kingdom			155	4,023	155	4,023
Total	6,807	232,633	121,633	4,188,015	128,440	4,420,648
Asia: Japan	18	7,886			18	7,886
Grand total	14,295	765,995	233,394	9,764,444	247,689	10,530,439

[1] Owing to changes in tabulating procedures by the Bureau of the Census, data known not to be strictly comparable to those for earlier years.

TECHNOLOGY

Perhaps the most notable technological advances in recent years were made in production methods and equipment. After decades of development in Europe, machines have been perfected, and three peat-winning methods were developed and are in wide use in several European countries today. These are the machine-sod peat method, the milled-peat method, and the hydropeat method; each depends upon specially designed equipment for winning and processing the peat mechanically or hydraulically.

Machine peat is produced in western Europe by German-designed machines known as "Baggers." These are, essentially, large 40- to 50-ton bucket-chain excavators that move on caterpillar treads and dig, macerate, shape, and spread peat sods upon the ground to dry. After drying, another machine collects the sods and conveys them to railroad cars or trucks for movement to their destination.

Milled peat is produced in Ireland by rapidly hauling spike-studded cylinders across properly drained peat surfaces. Spikes one-half inch long dig and lift the upper surface of a peat deposit, throwing it to the rear in fine particles. After drying, it is rigged by machines with adjustable blades, similar to road scrapers, and subsequently mechanically loaded out.

The equipment above, however, was designed primarily for large peat areas. Another machine (the Liliput excavator), recently introduced, shows promise for use in smaller bogs. This machine weighs 9 to 10 tons, is powered by a single 65-hp. internal-combustion engine, and mechanically excavates, macerates, forms, and spreads peat. It excavates 50 to 75 cubic yards of peat per hour and was designed and manufactured in Germany.

Hydropeat is produced by means of high-pressure jets of water which wash the peat from the bog into adjoining ditches. The slurry is then pumped into settling ponds, from which the concentrate is further pumped and spread to dry in the sun. After drying to a limited extent, the material is treated essentially as machine-sod peat.

The magnitude of the peat winning and processing operations in the U. S. S. R. (approximately 85 percent of estimated world production in 1956—see World Review, table 8) has permitted development of separate machines for each stage of the peat winning and processing operation, beginning with forest clearing and drainage-ditch construction, and proceeding through each phase of separation of the peat from the bog, drying, gathering, piling, mechanical track laying for the narrow-gage railway, and finally loading and transporting the peat to the powerplants. Under these fully rationalized mechanized operating conditions, Soviet Union engineers claim that the milled-peat method is the most economical and that the machine-sod and hydropeat methods are about 50 percent more expensive.

Peat is used in Ireland and the U. S. S. R. for generating large quantities of electric power, and furnaces have been developed that can efficiently burn milled peat containing up to 55 percent moisture. The Russians developed equipment of this type several years ago when they introduced the Th. T. I. Mosenergos furnace. This boiler employs a form of suspension burning which is accomplished by blowing preheated pulverized peat into a combustion chamber where it is ignited and burned. As in other modern peat-burning equipment used in Russia, Ireland, and Sweden, this furnace employs waste heat to reduce the moisture content in the peat before burning. Stack losses in modern boilers generally amount to about 6 to 10 percent of the total heat input; and by utilizing 25 to 50 percent of this waste heat to dry the incoming fuel, peat-burning efficiency can be raised closer to that of coal. Nevertheless, sod peat will continue to be produced to supply the sod-peat-burning powerplants already in operation. Such powerplants have boilers equipped with traveling-grate stokers designed to operate with approximately 4 to 5 feet of fuel-bed depth. Plants of this type are considered obsolete and will be replaced with milled-peat-burning furnaces.

Several foreign countries are currently producing peat fertilizers, which are, essentially, fine peat with additions of various nitrogenous and other compounds. One type made in Italy and marketed under the trade name of "Flotal" utilizes ferrous and ammonia compounds in combination with "humic substances." "Humauby," made in France, and "Humon Linzz," made in Austria, consist of milled peat plus various amounts of nitrogen, phosphorus, and potassium compounds.

A research team at the University of Minnesota recently determined that pulverized peat, reinforced with an alkali solution, lowers the cost and serves as an excellent binder for pelletizing fine taconite concentrates. Raw taconite contains only about 25 percent iron; and, since this iron content is too low for a direct feed to blast furnaces, the ore must be concentrated. This is accomplished by grinding taconite into fine particles and magnetically separating it from the rock. The purified ore contains about 65 percent iron but it is too fine for blast-furnace use and must be pelletized in a balling drum, after which the pellets are baked or sintered in a furnace. A binder is used to give the pellets enough strength to withstand handling and to hold their form during sintering. Bentonite and gelatinized starch are currently used as binders; but the Minnesota research team found that peat alkali also makes a good binding material, and preliminary estimates indicate that it is cheaper. Peat's qualities as a taconite binder, however, are based upon laboratory studies only.

WORLD REVIEW [3]

The estimated world production of peat in 1956 was nearly 66 million tons. The U. S. S. R. produced approximately 85 percent of the world total; Ireland, 6 percent; and West Germany, 3 percent. The combined output of the 16 remaining peat-producing countries was 6 percent of the total; and the United States produced about 0.5 percent.

To understand the potential value of our own peat reserves, we can look at the manner in which several European countries are currently exploiting their peat resources. The U. S. S. R. has a highly mechanized peat industry and about 1920 began to develop peat reserves estimated to be capable of yielding 160 billion tons of air-dried peat. Peat is used in Soviet Russia chiefly for generating electric power, domestic and industrial heating, and manufacturing gas and chemicals. In 1955 an estimated 13 billion kw.-hr. of electricity, or about 9 percent of the total electricity generated from thermal power in the U. S. S. R., was produced from peat.

A notable example of mechanization is the Irish peat industry under Bord Na Mona, a statutory corporation that was set up by the Irish Parliament in 1946 to develop the peat resources of Ireland, with

[3] Figures on world production compiled by Pearl J. Thompson, Division of Foreign Activities, Bureau of Mines.

particular emphasis on peat for electric power. In 1956, Bord Na Mona production exceeded 1 million net tons, of which 336 thousand was milled peat and 918 thousand was machine-won sod peat. Virtually all was used for generating electricity, and peat-fired boilers produced about 25 percent of Ireland's electrical output in 1956. At present, two large peat-fired power stations are in operation in Ireland, and a third is scheduled to open in 1957. The present plants (Portarlington and Allenwood) operate on machine-won sod peat, while the new plant (Ferbane) will use milled peat. Some idea of the extent to which the bogs supplying these stations have been developed is indicated by the size and equipment of the operation at Clonsast bog, which supplies Portarlington station. Clonsast bog comprises an area of approximately 4,400 acres and is drained by about 370 miles of surface drains. Cutting trenches are spaced parallel to each other at 250-yard intervals and have a total length of 44 miles. The bog has about 16 miles of permanent 3-foot-gage railway and approximately 30 miles of overhead lines placed 500 yards apart to supply power to the machines. The peak labor force during the working months is about 800 men.

Germany is also developing its peat resources, despite rich coal deposits. In 1956 over 1 million tons of peat was produced in West Germany for fuel purposes, chiefly for powerplants and industrial and domestic heating.

TABLE 8.—World production of peat, 1952–56, by countries, in thousand net tons [1]

Country	1952	1953	1954	1955	1956
Austria, fuel [2]	55	55	55	45	45
Canada, agricultural use [3]	75	82	99	118	125
Denmark	1,792	633	601	785	778
Finland:					
Agricultural use	[2] 220	4	[2] 9	[2] 9	[2] 9
Fuel		216	[2] 175	[2] 180	[2] 190
France:					
Agricultural use	85	25	47	47	[2] 50
Fuel			4	4	[2] 6
Germany:					
East [2]	550	550	550	550	550
West:					
Agricultural use	371	485	480	492	659
Fuel	897	992	1,041	1,153	1,005
Hungary [2]	55	55	60	65	65
Iceland [2]	3	1	(4)	(4)	(4)
Ireland:					
Agricultural use	4	6	9	10	[2] 10
Fuel	4,254	4,255	3,025	3,939	4,048
Israel, agricultural use	---	---	29	43	[2] 43
Italy	1	1	1	[2] 1	[2] 1
Japan [2]	33	55	65	75	75
Korea, Republic of	89	83	[2] 275	448	[2] 450
Netherlands	766	499	[2] 500	[2] 500	[2] 500
Norway:					
Agricultural use	29	23	23	31	[2] 30
Fuel	366	279	261	265	[2] 265
Spain	2	1	---	---	---
Sweden:					
Agricultural use	100	[2] 100	[2] 70	[2] 70	[2] 70
Fuel	288	[2] 275	[2] 275	[2] 275	[2] 275
U. S. S. R.	41,000	42,550	49,700	56,200	[2] 48,800
United States, agricultural use	211	204	244	274	292
World total [2]	51,250	51,430	57,600	65,580	58,340

[1] Includes revisions of data published previously. Data do not add to totals shown because of rounding.
[2] Estimated.
[3] In addition, Canada produces a negligible amount of peat fuel.
[4] Negligible.

Production in England, Scotland, and Wales is low, but these countries are studying the possibilities of using peat for generating electric power and for extracting chemicals.

Sweden has large forest areas but, realizing that its timber is too valuable to use for fuel, is actively investigating the potentialities of its peat bogs. At present, a briquet factory and an experimental carbonization plant are in operation.

Finland also has extensive forest areas but is concerned with conserving them. Since peat is Finland's only other fuel resource, attempts are being made to develop this source of energy.

Peat has long been used for fuel in Denmark, and the Danes have contributed much to the art of peat processing. The Danish peat industry is financed entirely by private capital, and Denmark is producing some of the cheapest peat products in western Europe.

Canada contains about 10 percent of the world's peat reserves but produced less than 1 percent of the world's output in 1956. Virtually all of Canada's production is exported to the United States, where it is used for soil improvement.

B. Petroleum and Related Products

Petroleum Asphalt

By Albert T. Coumbe and Mildred C. Putnam

SCOPE OF REPORT

SCHEDULES for reporting sales of asphalt and road oil in 1956 were sent to 94 asphalt-producing companies; of these, 83 submitted the requested information. The other producers failed to reply, had merged with other companies, or went out of business. In addition, 18 out of 21 asphalt-emulsion manufacturers reported a breakdown of their sales. No attempt was made to estimate the sales of the nonrespondents, as it was not believed the quantities they handled were relatively important.

The total sales of asphalt and road oil, as reported in this annual survey, are not strictly comparable with the apparent domestic consumption shown in tables 1 and 2, because these annual sales figures

TABLE 1.—Salient statistics of petroleum asphalt in the United States, 1955–56, by months and districts

(Thousand short tons)[1]

	Production		Imports[2] (including natural)		Exports[3]		Stocks (end of period)		Apparent domestic consumption[4]	
	1955	1956[5]	1955[6]	1956[5]	1955[6]	1956[5]	1955	1956[5]	1955[6]	1956[5]
Month:										
January	772	806	30	35	16	12	1,568	1,646	523	596
February	769	861	38	21	17	37	1,798	1,929	560	562
March	921	1,081	45	43	22	35	1,976	2,194	766	824
April	1,141	1,206	55	43	18	23	2,141	2,398	1,013	1,023
May	1,423	1,467	41	51	40	21	2,095	2,355	1,471	1,541
June	1,600	1,715	49	41	16	9	1,808	2,077	1,920	2,025
July	1,728	1,823	90	66	25	45	1,656	1,752	1,946	2,169
August	1,720	1,922	51	152	25	13	1,258	1,396	2,143	2,416
September	1,646	1,783	64	78	34	17	1,053	1,242	1,880	1,998
October	1,469	1,728	59	64	26	21	1,031	1,200	1,524	1,812
November	1,095	1,195	32	43	17	16	1,183	1,410	957	1,012
December	829	892	51	62	29	20	1,413	1,664	622	680
Total	15,113	16,479	605	699	285	269	1,413	1,664	15,325	16,658
District:										
East Coast	3,448	3,696					251	312		
Appalachian	551	566					53	46		
Indiana, Illinois, Kentucky, etc	2,903	2,914					252	311		
Minnesota, Wisconsin, North Dakota	------	167					------	16		
Oklahoma, Kansas, etc	1,690	1,893	(7)	(7)	(7)	(7)	237	285	(7)	(7)
Texas Inland	809	820					82	82		
Texas Gulf Coast	1,048	1,074					80	89		
Louisiana Gulf Coast	920	966					86	99		
Arkansas, Louisiana Inland, etc	836	893					59	82		
Rocky Mountain	889	1,157					144	141		
California	2,019	2,333					169	201		
Total	15,113	16,479	605	699	285	269	1,413	1,664	15,325	16,658

[1] Converted from barrels to short tons (5.5 barrels=1 short ton).
[2] Imports into continental United States only.
[3] Includes shipments to noncontiguous Territories.
[4] Production, plus imports, less exports, plus or minus change in stocks.
[5] Preliminary figures.
[6] Revised.
[7] Figures not available.

TABLE 2.—Salient statistics of road oil in the United States, 1955–56, by months and districts

(Short tons)[1]

Month and district	Production		Stocks (end of period)		Apparent domestic consumption[2]	
	1955	1956[3]	1955	1956[3]	1955	1956[3]
Month:						
January	35,818	29,818	85,818	79,818	28,909	51,818
February	42,364	38,364	97,091	86,727	31,091	31,455
March	64,182	74,363	116,364	121,636	44,909	39,455
April	86,909	108,000	148,000	166,000	55,274	63,636
May	155,636	157,818	164,909	195,636	138,727	128,182
June	207,455	230,909	157,818	191,818	214,546	234,727
July	275,636	262,364	140,364	187,636	293,091	266,545
August	286,727	222,182	107,273	129,455	319,818	280,364
September	190,727	180,000	100,364	129,273	197,636	180,182
October	106,909	75,273	93,455	104,545	113,818	100,000
November	53,273	41,455	98,000	92,182	48,727	53,818
December	36,546	38,909	101,818	91,091	32,727	40,000
Total	1,542,182	1,459,455	101,818	91,091	1,519,273	1,470,182
District:						
East Coast	21,091	23,818	1,091	909	(4)	(4)
Appalachian	12,182	8,726	5,454	545		
Indiana, Illinois, Kentucky, etc.	295,818	345,272	20,181	21,273		
Minnesota, Wisconsin, North Dakota						
Oklahoma, Kansas, etc.	210,545	232,364	7,091	8,182		
Texas Inland	2,727					
Texas Gulf Coast	1,818	1,638	364	182		
Louisiana Gulf Coast	182	182	182	182		
Arkansas, Louisiana Inland, etc.	182	182	364	182		
Rocky Mountain	420,364	284,728	20,909	17,091		
California	577,273	562,545	46,182	42,545		
Total	1,542,182	1,459,455	101,818	91,091	1,519,273	1,470,182

[1] Converted from barrels to short tons (5.5 barrels=1 short ton).
[2] Production, plus or minus change in stocks.
[3] Preliminary figures.
[4] Figures not available.

are reported by the sales departments of the oil companies, whereas the apparent domestic consumption is calculated from the production and stocks reported by the petroleum refineries of the oil companies and data on imports and exports released by the Bureau of the Census, United States Department of Commerce, appearing in the Monthly Petroleum Statement of the Bureau of Mines. Furthermore, some water or other liquids added to make emulsified asphalts can increase the volume to some extent. Also heavy fuel oil is sometimes delivered as road oil, so that the sales total can be above the monthly figures.

SALES

Sales of asphalt and asphaltic products (17.3 million short tons) were 10 percent above the 1955 total. Asphalt sold for paving purposes in 1956 (12.2 million short tons) was 13 percent above the 1955 total, reflecting the expansion in road construction, and made up 71 percent of all requirements, compared with a 69-percent share in 1955. The total petroleum asphalt, including cements, cutback asphalt, and emulsified products, was 12.2 million short tons sold for paving purposes, such as for public highways, roads on private property, sidewalks, automobile parking areas, and airfield runways.

TABLE 3.—Sales of petroleum-asphalt paving products in the United States, 1955–56, by districts and States

(Short tons)

District [1] and State	Asphalt cements		Cutback asphalts		Emulsified asphalt		Total	
	1955	1956	1955	1956	1955	1956	1955	1956
District 1:								
Connecticut	52,034	68,161	37,574	45,264	5,705	3,092	95,313	116,517
Delaware	13,652	17,313	10,743	15,650	602	843	24,997	33,806
Florida	215,655	280,219	155,444	139,260	22,529	23,138	393,628	442,617
Georgia	184,292	188,456	81,047	73,822	3,350	4,921	268,689	267,199
Maine	61,148	27,562	[2] 53,476	49,654	18,413	6,607	[2] 133,037	83,823
Maryland and District of Columbia	132,121	155,092	96,417	93,643	19,969	21,671	248,507	270,406
Massachusetts	185,696	284,684	68,045	74,937	1,706	1,861	255,447	361,482
New Hampshire	18,294	26,766	33,424	26,569	204	154	51,922	53,489
New Jersey	205,752	184,585	78,805	87,777	3,752	4,127	288,309	276,489
New York	358,128	409,624	195,528	207,049	108,095	107,202	661,751	723,875
North Carolina	164,028	176,448	116,381	114,402	22,957	28,892	303,366	319,742
Pennsylvania	330,623	335,504	124,481	162,026	44,759	45,951	499,863	543,481
Rhode Island	32,346	39,933	21,953	28,819	1,178	618	55,477	69,370
South Carolina	75,588	77,681	31,897	38,979	64	100	107,549	116,760
Vermont	7,620	8,782	19,855	18,689	294	28	27,769	27,499
Virginia	107,025	134,421	111,062	129,364	3,060	3,766	221,147	267,551
West Virginia	40,072	58,358	36,111	31,989	4,076	3,438	80,259	93,785
Total	2,184,074	2,473,589	[2] 1,272,243	1,337,893	260,713	256,409	[2] 3,717,030	4,067,891
District 2:								
Illinois	143,786	213,382	103,649	112,339	9,799	8,784	257,234	334,505
Indiana	109,142	127,782	125,049	166,493	66,934	108,103	301,125	402,378
Iowa	59,286	107,500	127,671	100,682	[2] 26,820	35,780	[2] 213,777	243,962
Kansas	51,818	144,933	173,962	188,500	3,567	2,101	229,347	335,534
Kentucky	75,710	88,502	65,800	77,388	17,530	20,032	159,040	185,922
Michigan	123,532	152,044	76,201	121,574	42,454	33,292	242,187	306,910
Minnesota	121,302	134,473	295,745	210,520	6,346	7,467	423,393	352,460
Missouri	121,450	111,427	94,878	130,797	4,496	5,461	220,824	247,685
Nebraska	31,909	31,767	77,967	72,402	960	698	110,836	104,867
North Dakota	70,255	100,396	37,601	55,315	1,034	4,252	108,890	159,963
Ohio	302,544	321,208	256,601	306,090	102,926	116,546	662,071	743,844
Oklahoma	77,272	102,906	137,406	163,090	4,812	3,796	219,490	269,792
South Dakota	39,839	71,818	31,017	40,327	4,462	97	75,318	112,242
Tennessee	[2] 176,571	191,244	[2] 93,329	107,948	17,639	16,249	[2] 287,539	315,441
Wisconsin	91,324	116,301	117,286	94,818	9,026	9,862	217,636	220,981
Total	[2] 1,595,740	2,015,683	[2] 1,814,162	1,948,283	[2] 318,805	372,520	[2] 3,728,707	4,336,486
District 3:								
Alabama	109,670	171,597	76,443	69,943	27,656	38,858	213,769	280,398
Arkansas	39,308	58,047	40,542	66,305	11,053	11,701	90,903	136,053
Louisiana	129,587	184,147	46,407	44,710	18,386	15,908	194,380	244,765
Mississippi	[2] 65,519	70,759	[2] 38,232	43,959	17,160	17,563	[2] 120,911	132,281
New Mexico	92,111	78,878	64,483	65,112	2,352	2,810	158,946	146,800
Texas	432,233	473,562	181,155	173,627	28,031	29,526	641,419	676,715
Total	[2] 868,428	1,036,990	[2] 447,262	463,656	104,638	116,366	[2] 1,420,328	1,617,012
District 4:								
Colorado	73,733	106,129	71,170	62,480	351	275	145,254	168,884
Idaho	13,245	17,567	32,541	39,915	2,333	2,499	48,119	59,981
Montana	10,499	22,750	48,355	46,938	6,435	6,877	65,289	76,565
Utah	55,734	71,164	41,335	41,809	4	-------	97,073	112,973
Wyoming	27,883	31,775	47,919	36,682	-------	19	75,802	68,476
Total	181,094	249,385	241,320	227,824	9,123	9,670	431,537	486,879
District 5:								
Arizona	26,382	49,110	25,350	41,340	11,555	11,186	63,287	101,636
California	748,356	871,806	86,735	110,726	142,190	119,291	977,281	1,101,823
Nevada	12,842	16,816	4,160	9,228	2,847	3,116	19,849	29,160
Oregon	155,208	158,541	45,693	40,896	10,225	4,606	211,126	204,043
Washington	94,703	137,802	101,634	121,628	764	3,495	197,101	262,925
Total	1,037,491	1,234,075	263,572	323,818	167,581	141,694	1,468,644	1,699,587
Total United States	[2] 5,866,827	7,009,722	[2] 4,038,559	4,301,474	[2] 860,860	896,659	[2] 10,766,246	12,207,855

[1] States are grouped according to petroleum-marketing districts rather than geographic regions.
[2] Revised.

TABLE 4.—Sales of petroleum-asphalt roofing products in the United States, 1955–56, by districts and States

(Short tons)

District [1] and State	Asphalt cements and fluxes		Emulsified asphalts		Total	
	1955	1956	1955	1956	1955	1956
District 1:						
Connecticut	15,532	12,880	24	19	15,556	12,899
Delaware	23,382	20,546	12	10	23,394	20,556
Florida	134,658	122,223			134,658	122,223
Georgia	49,078	58,469	12	17	49,090	58,486
Maine	[2] 101	350			[2] 101	350
Maryland and District of Columbia	60,880	55,681	176	223	61,056	55,904
Massachusetts	94,884	76,830	25	74	94,909	76,904
New Hampshire	320	536	1	8	321	544
New Jersey	424,943	355,419	105	120	425,048	355,539
New York	85,097	85,199	115	125	85,212	85,324
North Carolina	67,636	53,160	2	1	67,638	53,161
Pennsylvania	161,365	139,786	188	127	161,553	139,913
Rhode Island	73,441	65,391	3	3	73,444	65,394
South Carolina	24,383	31,292			24,383	31,292
Vermont	431	204	8	3	439	207
Virginia	3,279	5,006	13	7	3,292	5,013
West Virginia	27,956	20,879			27,956	20,879
Total	[2] 1,247,366	1,103,851	684	737	[2] 1,248,050	1,104,588
District 2:						
Illinois	501,147	538,683	53	32	501,200	538,715
Indiana	92,835	82,998	28	33	92,863	83,031
Iowa	7,361	7,056	3	3	7,364	7,059
Kansas	8,268	10,527			8,268	10,527
Kentucky	4,201	2,308	17	14	4,218	2,322
Michigan	71,739	65,592	46	55	71,785	65,647
Minnesota	49,982	87,233	5	2	49,987	87,235
Missouri	152,712	158,010			152,712	158,010
Nebraska	2,333	5,296			2,333	5,296
North Dakota	759	1,547			759	1,547
Ohio	70,573	87,824	1,541	2,411	72,114	90,235
Oklahoma	4,146	3,449			4,146	3,449
South Dakota	1,302	1,883			1,302	1,883
Tennessee	35,984	48,428	12		35,996	48,428
Wisconsin	8,855	9,026	16	19	8,871	9,045
Total	1,012,197	1,109,860	1,721	2,569	1,013,918	1,112,429
District 3:						
Alabama	105,559	101,750	11	13	105,570	101,763
Arkansas	42,966	41,252	9,475	13,119	52,441	54,371
Louisiana	167,466	169,408	4	2	167,470	169,410
Mississippi	5,241	9,674	4	2	5,245	9,676
New Mexico	12,564	15,679			12,564	15,679
Texas	302,876	213,371	1		302,877	213,371
Total	636,672	551,134	9,495	13,136	646,167	564,270
District 4:						
Colorado	19,726	24,045		1	19,726	24,046
Idaho	1,023	2,621			1,023	2,621
Montana	2,019	6,077			2,019	6,077
Utah	1,703	5,026			1,703	5,026
Wyoming	1,162	2,000			1,162	2,000
Total	25,633	39,769		1	25,633	39,770
District 5:						
Arizona	2,653	225			2,653	225
California	449,646	441,972	64	76	449,710	442,048
Nevada	3,269	922			3,269	922
Oregon	100,104	112,967	9	4	100,113	112,971
Washington	12,804	33,581	19	10	12,823	33,591
Total	568,476	589,667	92	90	568,568	589,757
Total United States	[2] 3,490,344	3,394,281	11,992	16,533	[2] 3,502,336	3,410,814

[1] States are grouped according to petroleum-marketing districts rather than conventional geographic regions.
[2] Revised.

TABLE 5.—Sales of all other petroleum-asphalt products in the United States, 1955–56, by districts and States

(Short tons)

District [1] and State	Asphalt cements and fluxes		Emulsified asphalts		Total	
	1955	1956	1955	1956	1955	1956
District 1:						
Connecticut	14, 163	15, 034	74	368	14, 237	15, 402
Delaware	802	651	42	7	844	658
Florida	31, 197	41, 787	2, 619	2, 027	33, 816	43, 814
Georgia	50, 145	46, 057	1, 561	873	51, 706	46, 930
Maine	4, 500	4, 574	3	985	4, 503	5, 559
Maryland and District of Columbia	25, 233	24, 322	1, 725	1, 561	26, 958	25, 883
Massachusetts	27, 356	28, 717	850	962	28, 206	29, 679
New Hampshire	3, 056	119	25	58	3, 081	177
New Jersey	118, 957	138, 222	1, 750	1, 527	120, 707	139, 749
New York	44, 032	42, 202	385	2, 103	44, 417	44, 305
North Carolina	16, 704	21, 515	1, 727	238	18, 431	21, 753
Pennsylvania	169, 660	171, 359	2, 036	1, 806	171, 696	173, 165
Rhode Island	22, 613	21, 160	26	217	22, 639	21, 377
South Carolina	850	1, 023	67		917	1, 023
Vermont	3, 021	1, 715	13	52	3, 034	1, 767
Virginia	14, 875	21, 562	202	151	15, 077	21, 713
West Virginia	39, 355	38, 927	52	85	39, 407	39, 012
Total	586, 519	618, 946	13, 157	13, 020	599, 676	631, 966
District 2:						
Illinois	209, 276	272, 345	6, 862	7, 188	216, 138	279, 533
Indiana	40, 739	57, 479	309	534	41, 048	58, 013
Iowa	5, 281	5, 611	167	23	5, 448	5, 634
Kansas	11, 015	16, 538	49	131	11, 064	16, 669
Kentucky	3, 096	1, 825	7	469	3, 103	2, 294
Michigan	41, 678	41, 517	3, 398	3, 128	45, 076	44, 645
Minnesota	39, 783	42, 612	395	527	40, 178	43, 139
Missouri	63, 930	63, 466	1, 640	1, 518	65, 570	64, 984
Nebraska	2, 869	2, 109	23	7	2, 892	2, 116
North Dakota	1, 631	4, 688		43	1, 631	4, 731
Ohio	91, 442	83, 776	2, 303	3, 478	93, 745	87, 254
Oklahoma	11, 054	10, 644	52	59	11, 106	10, 703
South Dakota	1, 017	1, 194		7	1, 017	1, 201
Tennessee	13, 347	27, 285	83	76	13, 430	27, 361
Wisconsin	29, 097	61, 522	774	555	29, 871	62, 077
Total	565, 255	692, 611	16, 062	17, 743	581, 317	710, 354
District 3:						
Alabama	3, 177	5, 576	228	2, 345	3, 405	7, 921
Arkansas	11, 334	8, 663	88	14	11, 422	8, 677
Louisiana	30, 382	40, 485	319	367	30, 701	40, 852
Mississippi	3, 644	20, 366	150	218	3, 794	20, 584
New Mexico	4, 536	3, 782	12	21	4, 548	3, 803
Texas	58, 124	62, 608	4, 520	561	62, 644	63, 169
Total	111, 197	141, 480	5, 317	3, 526	116, 514	145, 006
District 4:						
Colorado	18, 637	14, 839	15	48	18, 652	14, 887
Idaho	2, 309	1, 467	10	7	2, 319	1, 474
Montana	3, 735	382	11	5	3, 746	387
Utah	7, 420	5, 774	56	229	7, 476	6, 003
Wyoming	2, 487	6, 866		1	2, 487	6, 867
Total	34, 588	29, 328	92	290	34, 680	29, 618
District 5:						
Arizona	902	1, 552	69	90	971	1, 642
California	55, 460	96, 140	5, 185	4, 969	60, 645	101, 109
Nevada	382	530	94	47	476	577
Oregon	2, 552	4, 519	3, 044	2, 746	5, 596	7, 265
Washington	9, 566	8, 906	2, 201	2, 269	11, 767	11, 175
Total	68, 862	111, 647	10, 593	10, 121	79, 455	121, 768
Total United States	1, 366, 421	1, 594, 012	45, 221	44, 700	1, 411, 642	1, 638, 712

[1] States are grouped according to petroleum-marketing districts rather than conventional geographic regions.

The comparable quantity of portland cement is not available. However, data of the Bureau of Public Roads, United States Department of Commerce, indicate that, of these two materials, about 8.8 million short tons of asphaltic products and about 8.9 million short tons of portland cement were used for paving and maintaining public highways in 1956 and that an additional 2.9 million short tons of portland cement was used for bridges, culverts, and other structures on public highways in 1956.

The number of new building projects was lower in 1956 than in 1955, according to the United States Department of Commerce; consequently, sales of asphalt for roofing products (3.4 million short tons) were 3 percent below the 1955 total. Sales of asphalt for this particular use declined from 22 percent of the market in 1955 to 20 percent in 1956. Asphalt reported sold for manufacturing various miscellaneous products (1.7 million short tons) was 16 percent above the 1955 total and made up about 9 percent of all asphalt sales in both years.

Sales of road oil (1.5 million barrels in 1956) were 2 percent above 1955.

TABLE 6.—Sales of petroleum asphalt and road oil in the United States, 1955–56, by districts and States

(Short tons)

District [1] and State	Asphalt cements and fluxes	Emulsified asphalts	Cutback asphalts	Total 1956	Total 1955	Percent change	Road oil		Percent change
							1956	1955	
District 1:									
Connecticut	96,075	3,479	45,264	144,818	125,106	15.8			
Delaware	38,510	860	15,650	55,020	49,235	11.7	98	48	104.2
Florida	444,229	25,165	139,260	608,654	562,102	8.3	1	2	−50.0
Georgia	292,982	5,811	73,822	372,615	369,485	0.8	31	47	−34.0
Maine	32,486	7,592	49,654	89,732	137,641	−34.8			
Maryland and District of Columbia	235,095	23,455	93,643	352,193	336,521	4.7	130	168	−22.6
Massachusetts	390,231	2,897	74,937	468,065	378,562	23.6	649	146	344.5
New Hampshire	27,421	220	26,569	54,210	55,324	−2.0			
New Jersey	678,226	5,774	87,777	771,777	834,064	−7.5	2,210	1,085	103.7
New York	537,025	109,430	207,049	853,504	791,380	7.9	8,317	7,515	10.7
North Carolina	251,123	29,131	114,402	394,656	389,435	1.3	714	3	
Pennsylvania	646,649	47,884	162,026	856,559	833,112	2.8	10,860	13,195	−17.7
Rhode Island	126,484	838	28,819	156,141	151,560	3.0		159	
South Carolina	109,996	100	38,979	149,075	132,849	12.2	103		
Vermont	10,701	83	18,689	29,473	31,242	−5.7			
Virginia	160,989	3,924	129,364	294,277	239,516	22.9			
West Virginia	118,164	3,523	31,989	153,676	147,622	4.1	433	281	54.1
Total 1956	4,196,386	270,166	1,337,893	5,804,445		4.3	23,546		4.0
Total 1955	[2] 4,017,959	274,554	[2] 1,272,243		5,564,756			22,649	
District 2:									
Illinois	1,024,410	16,004	112,339	1,152,753	974,572	18.3	231,750	201,431	15.1
Indiana	268,259	108,670	166,493	543,422	435,036	24.9	26,299	23,001	14.3
Iowa	120,167	35,806	100,682	256,655	[2] 226,589	13.3	42,822	38,822	10.3
Kansas	171,998	2,232	188,500	362,730	248,679	45.9	1,999	1,591	25.6
Kentucky	92,635	20,515	77,388	190,538	166,361	14.5	15,144	13,269	14.1
Michigan	259,153	36,475	121,574	417,202	359,048	16.2	34,927	33,689	3.7
Minnesota	264,318	7,996	210,520	482,834	513,558	−6.0	41,103	48,424	−15.1
Missouri	332,903	6,979	130,797	470,679	439,106	7.2	150,806	90,943	65.8
Nebraska	39,172	705	72,402	112,279	116,061	−3.3	10,937	7,081	54.5
North Dakota	106,631	4,295	55,315	166,241	111,280	49.4	3,244	3,070	5.7
Ohio	492,808	122,435	306,090	921,333	827,930	11.3	15,972	25,286	−36.8
Oklahoma	116,999	3,855	163,090	283,944	234,742	21.0	24,896	6,114	307.2
South Dakota	74,895	104	40,327	115,326	77,637	48.5	48,709	32,315	50.7
Tennessee	266,957	16,325	107,948	391,230	[2] 336,965	16.1	559	248	125.4
Wisconsin	186,849	10,436	94,818	292,103	256,378	13.9	154,594	248,113	−37.7
Total 1956	3,818,154	392,832	1,948,283	6,159,269		15.7	803,761		3.9
Total 1955	[2] 3,173,192	[2] 336,588	[2] 1,814,162		[2] 5,323,942			773,397	

For footnotes, see end of table, p. 265.

TABLE 6.—Sales of petroleum asphalt and road oil in the United States, 1955–56, by districts and States—Continued

(Short tons)

District [1] and State	Asphalt cements and fluxes	Emulsified asphalts	Cutback asphalts	Total 1956	Total 1955	Percent change	Road oil 1956	Road oil 1955	Percent change
District 3:									
Alabama	278,923	41,216	69,943	390,082	322,744	20.9	126	182	−30.8
Arkansas	107,962	24,834	66,305	199,101	154,766	28.6	2,450	2,857	−14.2
Louisiana	394,040	16,277	44,710	455,027	392,551	15.9	4,487	2,646	69.6
Mississippi	100,799	17,783	43,959	162,541	[2] 129,950	25.1			
New Mexico	98,339	2,831	65,112	166,282	176,058	−5.6	2,085	5,208	−60.0
Texas	749,541	30,087	173,627	953,255	1,006,940	−5.3	37,692	22,634	66.5
Total 1956	1,729,604	133,028	463,656	2,326,288		6.6	46,840		39.7
Total 1955	[2] 1,616,297	119,450	[2] 447,262		[2] 2,183,009			33,527	
District 4:									
Colorado	145,013	324	62,480	207,817	183,632	13.2	25,710	18,782	36.9
Idaho	21,655	2,506	39,915	64,076	51,461	24.5	18,189	22,472	−19.1
Montana	29,209	6,882	46,938	83,029	71,054	16.9	9,445	13,768	−31.4
Utah	81,964	229	41,809	124,002	106,252	16.7	26,764	22,765	17.6
Wyoming	40,641	20	36,682	77,343	79,451	−2.7	20,083	26,950	−25.5
Total 1956	318,482	9,961	227,824	556,267		13.1	100,191		−4.3
Total 1955	241,315	9,215	241,320		491,850			104,737	
District 5:									
Arizona	50,887	11,276	41,340	103,503	66,911	54.7	21,413	15,398	39.1
California	1,409,918	124,336	110,726	1,644,980	1,487,636	10.6	472,043	488,605	−3.4
Nevada	18,268	3,163	9,228	30,659	23,594	29.9	13,020	6,632	96.3
Oregon	276,027	7,356	40,896	324,279	316,835	2.3	11,402	11,087	2.8
Washington	180,289	5,774	121,628	307,691	221,691	38.8	1,182	4,418	−73.2
Total 1956	1,935,389	151,905	323,818	2,411,112		13.9	519,060		−1.3
Total 1955	1,674,829	178,266	263,572		2,116,667			526,140	
Total United States, 1956	11,998,015	957,892	4,301,474	17,257,381		10.1	1,493,398		2.3
Total United States, 1955	[2] 10,723,592	[2] 918,073	[2] 4,038,559		[2] 15,680,224			1,460,450	

[1] States are grouped according to petroleum-marketing districts rather than geographic regions.
[2] Revised.

FOREIGN TRADE

IMPORTS [1]

Imports of asphalts, including solid and liquid petroleum asphalts and a minor quantity of natural asphalts increased from 609,000 short tons, valued at $7.7 million, in 1955 to 654,000 short tons, valued at $8.8 million, in 1956. This gain in imports in 1956 contrasts with a decline in 1955. Virtually all of the petroleum asphalts originated in Netherlands Antilles and Venezuela, while the larger share of the natural asphalts was credited to Trinidad and Tobago. These import figures represent quantities received in the continental United States and noncontiguous Territories; the monthly imports shown in table 1, taken from the Monthly Petroleum Statement of the Bureau of Mines, apply to continental United States only.

[1] Figures on imports and exposts compiled by Mae B. Price and Elsie D. Page, of the Bureau of Mines, from records of the Bureau of the Census.

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EXPORTS

TABLE 7.—Petroleum asphalt and products exported from the United States, 1955–56, by countries of destination

[Bureau of the Census]

Country	1955		1956	
	Thousand short tons	Thousand dollars	Thousand short tons	Thousand dollars
North America:				
Canada	38	$1,313	48	$1,561
Cuba	1	38	3	109
Mexico	27	442	31	406
Other North America	10	281	16	383
Total	76	2,074	98	2,459
South America:				
Bolivia	9	209	5	179
Chile	4	130	4	121
Colombia	8	219	5	139
Ecuador	16	268	3	71
Other South America	5	256	5	193
Total	42	1,082	22	703
Europe	6	280	8	536
Asia:				
India	37	1,005	3	82
Indonesia	15	396	1	27
Korea	13	370	2	67
Pakistan	1	42	12	351
Philippines	29	1,076	18	847
Thailand	8	227	4	97
Vietnam, Laos, Cambodia	1	23	15	426
Other Asia	4	173	5	234
Total	108	3,312	60	2,131
Africa:				
Belgian Congo	6	206	9	307
Rhodesia and Nyasaland, Federation of	4	118	9	276
Union of South Africa	18	571	20	630
Other Africa	8	321	6	299
Total	36	1,216	44	1,512
Oceania:				
New Zealand	1	40	3	125
Other Oceania	(1)	20	(1)	12
Total	1	60	3	137
Grand total	269	8,024	235	7,478

[1] Less than 1,000 short tons.

TECHNOLOGY

The asphalt industry has been encouraged by the greatly enlarged Federal highway-construction program, although it will not benefit until actual construction gets under way; for this reason, in 1956 the increase in road-asphalt consumption was only 13 percent. In view of the highway program, efforts have been increased on improving asphalt technology. These efforts are primarily of an engineering nature, related to improved asphalt application techniques and machinery for heavy duty roads.

Some encouraging results also have been obtained in developing procedures, asphalt types, and engineering techniques for heavy-duty airport construction and for the application of hot asphalt cement and aggregate cover for railway road beds. Related to all of these are the significant advances in the use of asphaltic materials for improving the characteristics of native soils for use in bases for highways and for improving secondary roads.

Asphalt trade organizations, manufacturers, and distributors have made a concerted effort to improve the asphalt-grade situation, which has plagued the industry. Until the present, there have been nine types of paving asphalt, which has resulted in lack of uniformity, needless expense, and confusion. Through research and a process of education and cooperation, there now have been developed five basic asphalt types, suitable for all road asphalt needs to supplant the former nine grades. One of these five grades, however, is adapted to specialty and industrial use. These have been agreed upon by the asphalt producers and the various State and Federal highway agencies, which also are working toward a reduction in the number of grades of liquid asphalt. This is a substantial forward step both technically and economically, for asphalt producers and users as well.

A new device for testing asphaltic materials, called the sliding-plate microviscometer, has been made available by the research laboratories of one of the larger asphalt producers. This instrument may prove helpful to asphalt technologists in the studies of such characteristics as aging, durability, temperature-viscosity characteristics, and curing rates.

Carbon Black

By Ivan F. Avery and Ann C. Mahoney

Contents

GENERAL SUMMARY

CARBON-BLACK production in 1956 increased 6 percent over the record high of 1955; however, domestic sales and exports declined 5 and 6 percent, respectively. Consequently, stocks increased 111 million pounds.

Sales to the rubber industry, which consumes 96 percent of total carbon black sold, decreased 3 percent. The sales for miscellaneous uses dropped 83 percent. Sales to all other consumers also declined. Furnace black composed 75 percent of all shipments and also continued to exceed the quantity of contact black exported.

TABLE 1.—Salient statistics of carbon black produced from natural gas and liquid hydrocarbons in the United States, 1952–56, in thousand pounds

	1952	1953	1954	1955	1956
Production:					
Contact process (chiefly channel)	563, 597	453, 345	378, 741	359, 487	363, 672
Furnace processes	1, 040, 505	1, 157, 092	1, 030, 806	1, 384, 025	1, 476, 296
Total	1, 604, 102	1, 610, 437	1, 409, 547	1, 743, 512	1, 839, 968
Shipments:					
Domestic sales	1, 154, 274	1, 200, 871	1, 095, 256	1, 373, 777	1, 303, 029
Exports	292, 908	358, 620	402, 777	454, 181	425, 328
Total	1, 447, 182	1, 559, 491	1, 498, 033	1, 827, 958	1, 728, 357
Losses	804	12	413	15	961
Stocks of producers Dec. 31	359, 350	410, 284	321, 385	236, 925	347, 574
VALUE					
Production .... thousand dollars	101, 988	104, 868	91, 375	117, 587	120, 252
Average per pound .... cents	6. 36	6. 51	6. 48	6. 74	6. 53

SCOPE OF REPORT

Annual statistics of the carbon-black industry were obtained from reports submitted to the Bureau of Mines from all operating plants in the United States by producers who represent 100 percent of commercial production. Carbon black is a very pure grade of quasi-

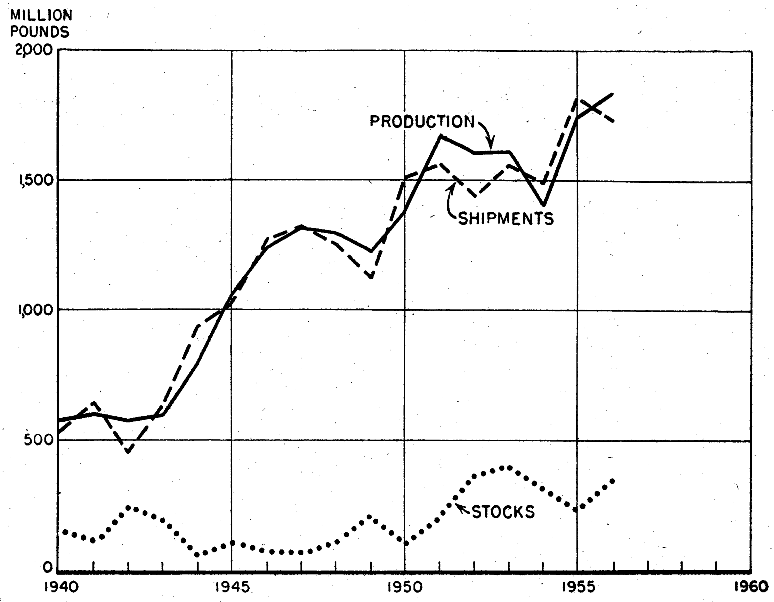

FIGURE 1.—Production, stocks, and shipments of carbon black, 1940–56.

graphitic carbon, with particle diameters ranging from 50 to 5,000 Angstrom units.

Export and import figures are compiled by the Bureau of the Census, United States Department of Commerce. Monthly figures are based on reports prepared by the National Gas Products Association and adjusted to agree with the annual reports received by the Bureau of Mines.

Data are obtained on furnace and contact blacks, the two general types produced commercially. Substantially all contact blacks are made by the channel process. Furnace blacks are broken down into six grades: Semireinforcing Furnace (SRF), High-Modulus Furnace (HMF), Fast-Extruding Furnace (FEF), High-Abrasion Furnace (HAF), Thermal; and Other. Statistics on Superabrasion Furnace (SAF) and Intermediate-Abrasion Furnace (ISAF) are included in Other. The production and uses of the various grades are described in Minerals Yearbooks 1948 and 1949.

PRODUCTION

Number and Capacity of Plants.—One furnace-type plant shut down in Texas during 1956. A new plant at Eunice, N. Mex., reported production of furnace black for the first time in 1956. The total number of companies and plants operating was the same in 1956 as in 1955, with 11 producers operating 42 plants. Owing to expansion of existing plants, the operating capacity increased from 5,425,100 pounds per day in 1955 to 5,567,310 in 1956.

Method and Yield.—The production of furnace black increased 7 percent in 1956, and the production of contact black remained about the same as in 1955. The average yield of furnace black per thousand cubic feet of natural gas rose 0.21 pound from 1955. The yield for contact black produced from natural gas was 2.01 pounds per million cubic feet in 1956—the same as in 1955. A 28-percent decrease in High-Modulus Furnace black production was offset by a 55-percent increase in output of Superabrasion Furnace (SAF) and the related Intermediate-Abrasion-Furnace (ISAF) grades of oil black. Data on Superabrasion grades are included in "Other" (table 4), which increased 34 percent over the 1955 output. The yield from oil is less for the Superabrasion Furnace black than for the High-Abrasion Furnace grades. However, overall yield of black produced from oil increased from 3.92 pounds per gallon in 1955 to 4.03 pounds in 1956.

TABLE 2.—Carbon black produced from natural gas and liquid hydrocarbons in the United States, 1952–56, by States and districts, in thousand pounds

State and district	1952	1953	1954	1955	1956	Change from 1955 (percent)
Louisiana	255, 939	376, 818	368, 233	502, 793	537, 723	6. 95
Texas:						
Panhandle district	613, 298	542, 006	420, 798	545, 060	574, 234	5. 35
Rest of State	460, 462	444, 421	393, 622	406, 416	414, 795	2. 06
Total Texas	1, 073, 760	986, 427	814, 420	951, 476	989, 029	3. 95
Other States	274, 403	247, 192	226, 894	289, 243	313, 216	8. 29
Grand total	1, 604, 102	1, 610, 437	1, 409, 547	1, 743, 512	1, 839, 968	5. 53

TABLE 3.—Carbon black produced in the United States, 1956, by States and districts, and natural gas and liquid hydrocarbons used in its manufacture

State	Producers reporting [1]	Number of plants	Production: Furnace black: Thousand pounds	Furnace black: Value at plant: Total (thousand dollars)	Furnace black: Value at plant: Cents per pound	Contact black: Thousand pounds	Contact black: Value at plant: Total (thousand dollars)	Contact black: Value at plant: Cents per pound
Louisiana	5	9	537,158	31,367	5.83	565	119	2.11
Texas:								
Panhandle district	7	12	469,606	28,069	5.97	104,628	10,962	10.47
Rest of State	5	12	252,393	16,514	6.54	162,402	12,351	7.60
Total Texas	8	24	721,999	44,583	6.17	267,030	23,313	8.73
Arkansas	1	1	}					
Oklahoma	1	1	} 206,619	12,626	6.11			
California	1	1	}			--------	--------	--------
Kansas	2	2	}					
New Mexico	3	4	10,520	459	4.36	96,077	7,785	8.10
Grand total:								
1956	11	42	1,476,296	89,035	6.03	363,672	31,217	8.59
1955	11	42	1,384,025	87,981	6.36	359,487	29,606	8.23

State	Natural gas used: Million cubic feet	Average yield [2] (pounds per M cubic feet): Furnace	Average yield: Contact	Value: Total (thousand dollars)	Value: Average (cents per M cu. ft.)	Liquid hydrocarbons used: Thousand gallons	Average yield (pounds per gallon)	Value: Total (thousand dollars)	Value: Average (cents per gallon)
Louisiana	28,706	8.84	0.51	2,298	8.00	73,630	3.98	5,640	7.65
Texas:									
Panhandle district	72,606	8.47	1.83	6,151	8.47	87,601	3.88	5,723	6.53
Rest of State	81,974	5.65	2.20	5,283	6.44	49,105	4.18	3,204	6.52
Total Texas	154,580	7.48	2.04	11,434	7.39	136,706	3.99	8,927	6.53
Arkansas	--------	--------	--------	--------	--------	}			
Oklahoma	--------	--------	--------	--------	--------	} 32,070	4.32	1,901	5.93
California	} 9,883	6.90	--------	1,403	14.19	}			
Kansas	}					}			
New Mexico	49,429	2.16	1.97	3,493	7.07	--------	--------	--------	--------
Grand total:									
1956	242,598	8.10	2.01	18,628	7.68	242,406	4.03	16,468	6.79
1955	244,794	7.89	2.00	19,398	7.92	221,101	3.92	13,704	6.19

[1] Detail will not add to totals, because some producers operate in more than 1 area.
[2] Partly estimated.

TABLE 4.—Production and shipments of carbon black in the United States in 1956, by months and grades, in thousand pounds

PRODUCTION[1]

Month	Furnace: Thermal	Furnace: SRF[2]	Furnace: HMF[3]	Furnace: FEF[4]	Furnace: HAF[5]	Furnace: ISAF & SAF[6]	Furnace: Other	Furnace: Total	Contact	Total
January	11,874	34,393	8,259	20,907	39,108	11,643	1,602	127,786	32,222	160,008
February	11,478	30,679	6,732	19,586	38,890	11,500	1,548	120,413	28,717	149,130
March	12,127	32,037	5,826	21,416	40,364	13,953	1,636	127,359	31,551	158,910
April	10,665	29,045	6,676	20,021	36,064	17,943	1,439	121,853	30,460	152,313
May	11,712	31,967	6,815	18,415	41,136	14,874	1,580	126,499	30,613	157,112
June	11,483	29,415	5,978	20,161	39,774	13,970	1,549	122,330	29,011	151,341
July	11,577	31,205	5,321	17,966	40,640	11,975	1,562	120,246	30,120	150,366
August	12,413	29,849	6,278	15,346	37,985	14,183	1,675	117,729	29,782	147,511
September	11,927	29,441	6,306	15,068	33,443	19,318	1,609	117,112	30,144	147,256
October	13,534	30,350	6,470	16,397	43,078	18,021	1,826	129,676	30,972	160,648
November	12,994	27,406	8,523	15,956	41,803	14,560	1,753	122,995	29,621	152,616
December	13,467	27,747	8,070	16,278	41,714	13,205	1,817	122,298	30,459	152,757
Total	145,251	363,534	81,254	217,517	473,999	175,145	19,596	1,476,296	363,672	1,839,968

SHIPMENTS (INCLUDING EXPORTS)[1]

Month	Furnace: Thermal	Furnace: SRF[2]	Furnace: HMF[3]	Furnace: FEF[4]	Furnace: HAF[5]	Furnace: ISAF & SAF[6]	Furnace: Other	Furnace: Total	Contact	Total
January	11,846	32,340	7,320	19,411	39,594	11,897	1,760	124,168	33,257	157,425
February	11,361	27,131	6,494	16,405	37,544	12,411	1,688	113,034	31,549	144,583
March	11,204	27,667	6,918	17,588	39,034	13,034	1,665	117,110	30,378	147,488
April	10,242	25,409	7,120	18,397	33,861	12,496	1,521	109,046	31,033	140,079
May	10,376	26,821	5,935	17,442	39,979	11,914	1,542	114,009	31,583	145,592
June	8,327	20,063	6,419	15,082	35,272	10,536	1,237	96,936	29,610	126,546
July	8,326	20,417	5,386	14,341	36,459	11,007	1,237	97,173	28,662	125,835
August	10,917	22,284	6,062	16,369	37,162	11,359	1,622	105,775	32,501	138,276
September	12,580	25,852	6,923	18,604	37,902	12,847	1,869	116,577	35,352	151,929
October	13,347	33,502	9,686	20,799	46,474	13,880	1,983	139,671	36,808	176,479
November	12,554	19,273	6,264	14,812	31,626	8,723	1,864	95,116	25,445	120,561
December	11,379	23,903	7,781	17,958	43,421	12,068	1,691	118,201	36,324	154,525
Total	132,459	304,662	82,308	207,208	458,328	142,172	19,679	1,346,816	382,502	1,729,318

[1] Compiled from reports of the National Gas Products Association and of producing companies not included in association figures. Figures adjusted to agree with annual reports of individual producers.
[2] Semireinforcing Furnace. [3] High-Modulus Furnace. [4] Fast-Extrusion Furnace.
[5] High-Abrasion Furnace. [6] Intermediate-Abrasion Furnace and Superabrasion Furnace.

TABLE 5.—Natural gas and liquid hydrocarbons used in manufacturing carbon black in the United States and average yield, 1952–56

	1952	1953	1954	1955	1956
Natural gas used .... million cubic feet	368,399	300,942	251,176	244,794	242,598
Average yield of carbon black per thousand cubic feet .... pounds	2.87	3.06	[1] 3.25	3.58	3.56
Average value of natural gas used per thousand cubic feet .... cents	5.46	5.87	6.89	7.92	7.68
Liquid hydrocarbons used .... thousand gallons	163,392	187,207	154,919	221,101	242,406
Average yield of carbon black per gallon .... pounds	3.35	3.68	3.83	3.92	4.03
Average value of liquid hydrocarbons used per gallon .... cents	8.15	7.69	6.66	6.19	6.79
Number of producers reporting	18	16	15	11	11
Number of plants	59	52	50	42	42

[1] Revised.

TABLE 6.—Number and capacity of carbon-black plants operated in the United States, 1956

State or district	County or parish	Number of plants, 1955, Contact	Number of plants, 1955, Furnace	Number of plants, 1956, Contact	Number of plants, 1956, Furnace	Total daily capacity (pounds), 1955	Total daily capacity (pounds), 1956
Texas:							
Panhandle district	Carson	1		1		1,530,000	1,577,000
	Gray	3	1	3	1		
	Hutchinson	1	4	1	4		
	Moore		1		1		
	Wheeler		1		1		
Total Panhandle district		5	7	5	7	1,530,000	1,577,000
Rest of State	Aransas	1	2	1	1	1,344,300	1,257,000
	Brazoria	1		1			
	Brooks	1		1			
	Ector	1		1			
	Gaines	1		1			
	Harris		1		1		
	Howard		1		1		
	Montgomery		1		1		
	Nueces	1		1			
	Reagan						
	Terry		1		1		
	Ward						
	Winkler	1		1			
Total rest of State		7	6	7	5	1,344,300	1,257,000
Total Texas		12	13	12	12	2,874,300	2,834,000
Louisiana	Avoyelles		1		1	1,530,800	1,603,310
	Calcasieu		1		1		
	Evangeline		1		1		
	Ouachita		2		2		
	Richland	1		1			
	St. Mary		3		3		
Total Louisiana		1	8	1	8	1,530,800	1,603,310
Arkansas	Union		1		1	748,000	788,000
California	Contra Costa		1		1		
Kansas	Grant		2		2		
Oklahoma	Kay		1		1		
New Mexico	Lea	3		3	1	272,000	342,000
Total United States		16	26	16	26	5,425,100	5,567,310

CONSUMPTION AND USES

Domestic sales of carbon black declined 5 percent in 1956, primarily because of a reduction in the sales of new automobiles, which decreased the demand for carbon black in the rubber industry. The rubber industry consumed 96 percent of the domestic sales in 1956. The average loading of carbon black in rubber rose from 822 pounds per long ton in 1955 to 844 pounds in 1956 because of decreased use of natural rubber, which requires a lower loading than synthetic rubber. Natural rubber constituted 39 percent of the total virgin-rubber consumption in 1956, compared with 42 percent in 1955.

TABLE 7.—Sales of carbon black for domestic consumption in the United States, 1952–56, by uses, in thousand pounds

Use	1952	1953	1954	1955	1956	Change from 1955 (percent)
Rubber	1,074,545	1,133,594	1,023,626	1,286,861	1,244,651	-3.28
Ink	44,116	45,801	48,797	55,313	42,047	-2.40
Paint	10,628	8,464	7,681	13,661	13,231	-3.15
Miscellaneous	24,985	13,012	15,152	17,942	3,100	-82.72
Total	1,154,274	1,200,871	1,095,256	1,373,777	1,303,029	-5.55

STOCKS

Total stocks increased 111 million pounds in 1956. The largest increases were in stocks of SRF grade, which increased 59 million pounds, and in the ISAF and SAF grades, which increased 33 million pounds.

TABLE 8.—Producers' stocks of contact- and furnace-type blacks in the United States, December 31, 1952–56, in thousand pounds

Year	Furnace							Contact	Total
	SRF[1]	HMF[1]	FEF[1]	HAF[1]	ISAF and SAF[1]	Other	Total		
1952	31,220	33,375	23,211	31,509	--------	4,464	123,779	235,571	359,350
1953	30,861	25,801	38,638	57,757	--------	20,875	173,932	236,352	410,284
1954	18,113	22,949	27,895	48,130	--------	[2] 16,850	133,937	187,448	321,385
1955	19,680	17,554	25,065	53,582	14,108	[2] 9,561	139,550	97,374	236,924
1956	78,552	16,500	35,374	69,253	47,081	[2] 22,270	269,030	78,544	347,574

[1] For explanation, see table 4.
[2] Includes thermal grade.

VALUE

There have been no open-market price changes in carbon black since 1953; however, the average value of furnace black to producers as reported to the Bureau of Mines declined 0.33 cent per pound in 1956, and the average value of contact black increased 0.36 cent per pound over 1955.

The average value of natural gas used as raw material declined 0.24 cent per thousand cubic feet in 1956. Average feedstock value of oil increased 0.60 cent per gallon in 1956.

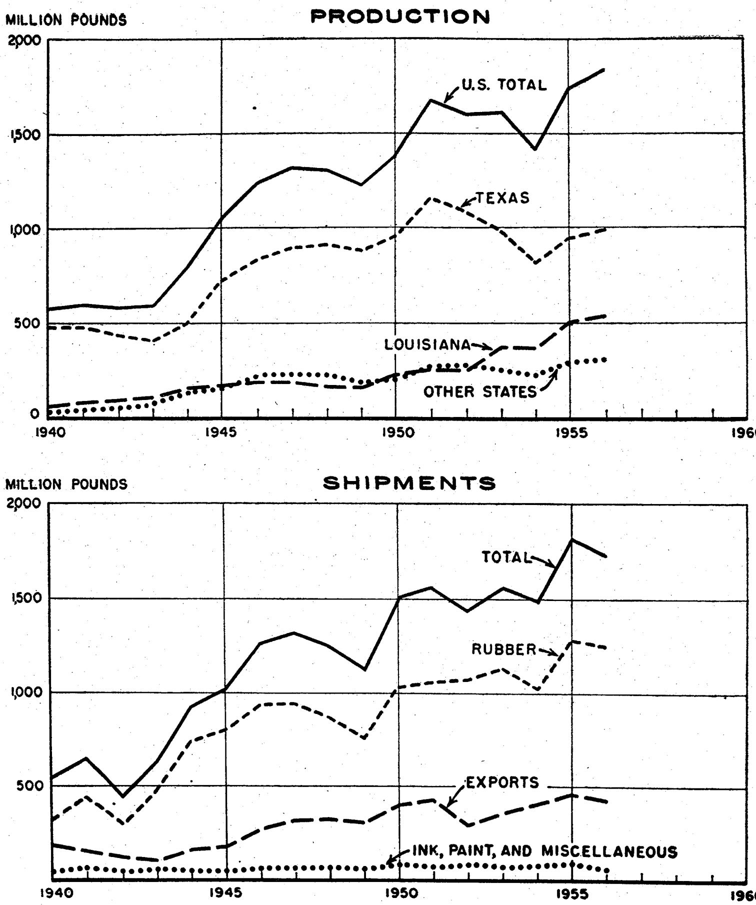

FIGURE 2.—Production and shipments of carbon black, 1940–56.

TABLE 9.—Prices of carbon black in carlots, f. o. b. plant, 1952–56 in cents per pound

[Oil, Paint and Drug Reporter]

Date	Channel blacks		Furnace blacks			
	Ordinary rubber grades [1]		Semireinforcing grades (SRF)	High-Modulus grades (HMF)	Fast-Extrusion grades (FEF)	High-Abrasion grades (HAF)
	Bags	Bulk	Bags	Bags	Bags	Bags
Jan. 1, 1952	7.40	7.00	4.00	5.50	6.00	7.90
Jan. 1, 1953	7.40	7.00	4.00	5.50	6.00	7.90
July 1, 1953	7.40	7.00	4.50	5.50	6.00	7.90
Jan. 1, 1954	7.40	7.00	4.50	5.50	6.00	7.90
Jan. 1, 1955	7.40	7.00	4.50	5.50	6.00	7.90
Jan. 1, 1956	7.40	7.00	4.50	5.50	6.00	7.90

[1] Chiefly Easy-Processing (EPC) and Medium-Processing (MPC), but also includes Hard-Processing (HPC) and Conductive (CC) channel blacks.

FOREIGN TRADE

Imports.—Acetylene-black imports of 8.4 million pounds, with an average value of 16.5 cents per pound, remained near those in 1955. A small quantity of carbon black, totaling 70,000 pounds, was imported from Canada, United Kingdom, and West Germany.

Exports.—Carbon-black exports decreased 28 million pounds in 1956 from a record 454 million pounds in 1955. Most of the decrease was reported for contact black. Shipments to countries previously receiving the major proportion of exports remained steady, except for exports to Australia and United Kingtom, which declined considerably. Exports to the South American countries also declined considerably.

TABLE 10.—Carbon black exported from the United States, 1954–56, by countries of destination

[Bureau of the Census]

Country	1954		1955		1956	
	Thousand pounds	Thousand dollars	Thousand pounds	Thousand dollars	Thousand pounds	Thousand dollars
North America:						
Canada	37,812	2,825	45,939	3,475	42,856	3,081
Cuba	1,268	111	1,316	108	1,551	123
Mexico	13,999	1,044	15,583	1,230	15,019	1,128
Other North America	76	8	85	8	97	10
Total	53,155	3,988	62,923	4,821	59,523	4,342
South America:						
Argentina	10,997	1,167	19,557	2,035	13,404	1,161
Brazil	31,411	2,869	25,320	2,265	20,157	1,792
Chile	2,985	248	3,555	291	1,795	145
Colombia	3,794	321	6,702	573	6,674	546
Ecuador	16	2	24	4	12	2
Peru	1,642	139	1,917	160	2,163	181
Uruguay	1,380	130	2,306	204	1,419	112
Venezuela	3,598	300	4,040	352	5,474	441
Other South America	20	3	70	7	52	4
Total	55,843	5,179	63,491	5,891	51,150	4,384
Europe:						
Austria	1,077	91	1,932	159	356	41
Belgium-Luxembourg	9,821	880	13,921	1,247	13,610	1,148
Denmark	888	94	822	87	481	70
Finland	853	75	1,192	111	1,096	96
France	73,606	6,680	83,581	7,510	87,483	7,359
Germany, West	9,987	1,071	13,411	1,368	14,221	1,336
Greece	402	36	379	33	522	39
Ireland	681	66	551	51	485	44
Italy	38,678	3,444	43,766	3,750	42,211	3,545
Netherlands	5,843	544	7,721	741	6,852	628
Norway	1,784	151	1,838	161	1,679	137
Portugal	2,009	163	1,479	119	831	68
Spain	5,570	511	8,054	696	6,629	545
Sweden	11,464	1,038	9,344	848	10,335	874
Switzerland	4,462	500	4,303	444	5,146	560
Trieste	230	16			134	12
United Kingdom	32,981	3,479	32,613	3,453	26,816	2,837
Yugoslavia	533	55	811	82	1,414	134
Total	200,869	18,894	225,718	20,860	220,301	19,473
Asia:						
India	12,733	1,086	13,743	1,145	13,105	1,062
Indonesia	4,556	409	5,147	475	5,023	484
Israel	2,815	229	2,979	245	1,750	139
Japan	13,322	1,290	20,042	1,947	27,738	2,448
Malaya	748	64	824	74	1,000	84
Pakistan	358	39	458	39	199	19
Philippines	302	17	300	29	1,969	165
Taiwan	140	13	106	10	120	12
Turkey	500	41	520	55	290	29
Vietnam, Laos, and Cambodia	50	5	22	3	36	7
Other Asia	678	73	961	89	1,178	110
Total	36,202	3,266	45,102	4,111	52,408	4,559
Africa:						
Union of South Africa	18,542	1,634	22,321	2,024	18,735	1,566
Other Africa	215	17	390	31	391	31
Total	18,757	1,651	22,711	2,055	19,126	1,597
Oceania:						
Australia	34,319	2,872	29,164	2,534	18,125	1,371
New Zealand	3,632	313	5,072	463	4,695	379
Total	37,951	3,185	34,236	2,997	22,820	1,750
Grand total	402,777	36,163	454,181	40,735	425,328	36,105

TABLE 11.—Carbon black exported from the United States in 1956, by months, in thousand pounds

[Bureau of the Census]

Month	Contact	Furnace	Total	Month	Contact	Furnace	Total
January	11,886	21,806	33,692	September	16,491	21,529	38,020
February	15,097	24,725	39,822	October	18,930	25,295	44,225
March	12,607	24,105	36,712	November	8,928	12,516	21,444
April	14,957	17,295	32,252	December	19,717	24,309	44,026
May	12,189	19,647	31,836				
June	14,662	22,922	37,584	Total:			
July	12,767	17,545	30,312	1956	175,004	250,324	425,328
August	16,773	18,630	35,403	1955	201,718	252,463	454,181

WORLD PRODUCTION

TABLE 12.—World production of carbon black, by countries, 1952–56

(Thousand pounds)

Countries	1952	1953	1954	1955	1956
Canada	----------	(1)	(1)	(1)	(1)
Germany	72,752	88,094	105,847	122,624	127,122
Japan	9,841	19,365	15,926	16,667	25,159
United Kingdom	69,888	102,592	145,600	170,016	182,784
United States	1,604,102	1,610,437	1,409,547	1,743,512	1,839,968
Yugoslavia	1,451	2,202	1,958	2,837	3,602

[1] Canada became a producer of carbon black in 1953, with completion in June of an oil-black furnace at Sarnia, Ontario, having a capacity of 20 million pounds per year. The capacity was increased to 60 million pounds in 1956. The actual production is not published to avoid disclosing individual company confidential data.

Natural Gas

By Ivan F. Avery and Ann C. Mahoney

Contents

GENERAL SUMMARY

THE CONTINUED growth of the natural-gas utility and pipeline industry set new records in almost all phases of operation. Marketed production of natural gas was 10,082 billion cubic feet in 1956—7-percent increase over 1955. The average price at the wellhead increased from 10.4 cents per thousand cubic feet in 1955 to 10.8 cents in 1956. Residential and commercial sales increased 10 and 14 percent, respectively, over 1955. The average number of customers served for residential and commercial uses reached the unprecedented level of 30.1 million in 1956, compared with 28.5 million in 1955.

TABLE 1.—Salient statistics of natural gas in the United States 1952–56

	1952	1953	1954	1955	1956
Million cubic feet					
Supply:					
Marketed production [1]	8,013,457	8,396,916	8,742,546	9,405,351	10,081,923
Withdrawn from storage	221,909	246,802	330,177	437,251	452,762
Imports	7,807	9,225	6,847	10,888	10,380
Total supply	8,243,173	8,652,943	9,079,570	9,853,490	10,545,065
Disposition:					
Consumption	7,613,478	7,979,338	8,402,852	9,070,343	9,706,878
Exports	27,456	28,322	28,726	31,029	35,963
Stored	398,593	404,838	432,283	505,185	589,232
Lost in transmission, etc	203,646	240,445	215,709	246,933	212,992
Total disposition	8,243,173	8,652,943	9,079,570	9,853,490	10,545,065
Value					
Production (at wells) ... thousand dollars	623,649	774,966	882,501	978,357	1,083,812
Average per M cubic feet ... cents	7.8	9.2	10.1	10.4	10.8

[1] Comprises gas sold or consumed by producers, including losses in transmission, amounts added to storage, and increases in gas in pipelines.

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The average value of natural gas at the point of consumption in 1956 was 41.5 cents per thousand feet, 1.5 cents above the 1955 average.

The American Gas Association stated that, at the end of 1956, the Nation's network of gas-company mains of all types reached 524,000 miles, an increase of 28,000 miles during the year—the largest annual gain in history. Of the total mileage, more than 324,000 miles were distribution facilities, 152,000 miles were transmission lines, and 47,000 miles were field and gathering lines for utility and pipeline companies.

SCOPE OF REPORT

Data on natural-gas production, consumption, and value are collected by annual questionnaires sent to producers of oil and gas, natural-gasoline-plant operators, gas-pipeline companies, and gas-utility companies. A separate report is filed by the respondent for each State in which he operates.

Volumes are reported at the pressure base selected by the reporting company; however, if the reported pressure base deviates more than 5 percent from 14.65 pounds per square inch absolute at 60° F., it is corrected to this base.

Reports are received covering approximately 75 percent of gross natural-gas production. The large number of respondents and the difficulty of contacting each small producer make direct compilation of total production impractical. The bulk of the output of nonreporting producers is accounted for in the purchases of reporting companies. Marketed production for each State equals consumption in the State, plus gas placed in storage, plus shipments to other States, less gas withdrawn from storage, less receipts from other States.

GOVERNMENT REGULATIONS

The total cost of construction authorized by the Federal Power Commission (FPC) in 1956 was $548,947,000. In addition to 6,665 miles of line, which will require an estimated 1,169,984 net tons of steel pipe, authorized construction included the installation of compressors aggregating 358,975 horsepower. These projects, when completed, will add 2.25 billion cubic feet of natural gas daily to existing capacity and will provide new or additional natural-gas service to 150 cities with populations of 50,000 or more and to hundreds of small communities.

RESERVES

Proved recoverable domestic reserves of natural gas attained a new peak of 237.8 trillion cubic feet at the end of 1956. The increase of 14.1 trillion cubic feet represents the largest annual gain since the American Gas Association Committee on Natural-Gas Reserves began preparing consistent annual estimates in 1946 and was achieved despite record net production of 10.9 trillion cubic feet.

New Mexico showed the most significant gain in proved recoverable reserves in 1956, with an increase of 4.9 trillion cubic feet or 27 percent.

TABLE 2.—Estimated proved recoverable reserves of natural gas in the United States, 1955–56, in million cubic feet [1]

[Committee on Natural-Gas Reserves, American Gas Association]

State	Reserves as of Dec. 31, 1955 [2]	Changes in reserves during 1956: Extensions and revisions [2]	Discoveries of new fields and new pools in old fields [2]	Net change in underground storage [3]	Net production [4]
Arkansas	1,164,367	2,990	38,457	−551	33,736
California [5]	8,892,950	258,495	76,317	11,264	487,793
Colorado	2,253,562	187,523	73,161	3,291	94,768
Illinois	233,565	2,574	1,395	7,180	25,009
Indiana	33,111	4,289	0	477	4,105
Kansas	16,293,080	1,652,569	195,316	3,042	577,750
Kentucky	1,262,270	46,051	7,600	1,681	72,000
Louisiana [5]	42,435,592	2,910,172	1,630,589	0	1,922,354
Michigan	325,874	4,562	15,377	27,995	12,022
Mississippi	2,608,340	−29,648	43,592	1,273	220,231
Montana	719,719	6,094	718	438	30,618
Nebraska	203,421	39,174	8,182	0	25,375
New Mexico	18,584,912	5,222,559	340,232	−33,116	641,880
New York	75,760	5,127	1,420	6,877	3,935
North Dakota	280,696	112,270	20,512	0	15,985
Ohio	809,874	39,845	6,390	29,225	31,727
Oklahoma	13,204,739	1,249,397	234,480	3,035	916,602
Pennsylvania	754,389	97,573	9,915	32,751	118,416
Texas [5]	108,287,548	6,944,630	2,829,100	2,423	5,334,951
Utah	420,896	170,461	46,949	0	18,520
Virginia	34,756	2,813	937	0	2,949
West Virginia	1,564,899	121,564	25,250	32,995	182,971
Wyoming	3,196,103	152,232	16,932	−199	129,136
Other States [6]	57,022	11,288	13,655	3,889	5,093
Total	223,697,445	19,214,604	5,636,476	133,970	10,907,926

State	Reserves as of December 31, 1956: Non-associated [7]	Associated [8]	Dissolved [9]	Underground storage [10]	Total
Arkansas	554,908	323,260	288,762	4,597	1,171,527
California [5]	2,164,272	2,058,459	4,462,694	65,808	8,751,233
Colorado	1,611,749	131,977	675,752	3,291	2,422,769
Illinois	5,535	500	186,026	27,644	219,705
Indiana	2,050	1,880	22,621	7,221	33,772
Kansas	17,022,526	146,698	340,400	56,633	17,566,257
Kentucky	1,161,206	0	62,617	21,779	1,245,602
Louisiana [5]	35,490,462	6,548,729	3,014,808	0	45,053,999
Michigan	45,596	20,680	61,418	234,092	361,786
Mississippi	1,627,795	500,852	272,464	2,215	2,403,326
Montana	549,031	36,203	80,336	30,781	696,351
Nebraska	121,487	12,608	91,307	0	225,402
New Mexico	17,052,725	4,694,721	1,673,733	51,528	23,472,707
New York	37,024	0	287	47,938	85,249
North Dakota	6,307	0	391,186	0	397,493
Ohio	532,226	0	37,960	283,421	853,607
Oklahoma	6,483,823	3,432,600	3,768,640	89,986	13,775,049
Pennsylvania	419,111	0	31,165	325,936	776,212
Texas [5]	70,801,507	25,580,088	16,329,920	17,235	112,728,750
Utah	546,361	19,075	54,350	0	619,786
Virginia	35,557	0	0	0	35,557
West Virginia	1,288,602	0	64,033	209,102	1,561,737
Wyoming	2,416,326	186,729	614,658	18,219	3,235,932
Other States [6]	56,727	0	19,225	4,809	80,761
Total	160,032,913	43,695,059	32,544,362	1,502,235	237,774,569

[1] Volumes are reported at a pressure base of 14.65 pounds per square inch absolute and at a standard temperature of 60° F.
[2] Excludes gas loss from recovery of natural-gas liquids.
[3] Net difference between gas stored in and gas withdrawn from underground storage reservoirs, including adjustments.
[4] Net production equals gross withdrawals less gas injected into underground reservoirs; changes in underground storage and gas loss from recovery of natural-gas liquids are excluded. December production partly estimated.
[5] Includes offshore reserves.
[6] Includes Alabama, Florida, Iowa, Maryland, Missouri, Nevada, and Virginia.
[7] Nonassociated gas is free gas not in contact with crude oil in the reservoir.
[8] Associated gas is free gas in contact with crude oil in the reservoir.
[9] Dissolved gas is gas in solution with crude oil in the reservoir.
[10] Net gas placed in underground reservoirs for storage purposes only.

GROSS WITHDRAWAL

Gross withdrawal equals marketed production, plus the quantity repressured, plus the partly estimated quantity vented and wasted. Gross withdrawal increased 6 percent over 1955. The quantity of

TABLE 3.—Gross withdrawals and disposition of natural gas in the United States, 1955–56, by States, in million cubic feet

State	Gross withdrawals [1]			Disposition		
	From gas wells	From oil wells	Total	Marketed production [2]	Repressuring	Vented and wasted [3]
1955						
Arkansas	19,000	36,000	55,000	32,123	16,649	6,228
California	215,000	587,000	802,000	538,178	255,496	8,326
Colorado	27,000	70,000	97,000	49,152	28,137	19,711
Illinois	400	40,000	40,400	8,033	637	31,730
Indiana	100	4,400	4,500	1,226	37	3,237
Kansas	461,000	64,000	525,000	471,041	2,174	51,785
Kentucky	73,000	3,000	76,000	73,214	79	2,707
Louisiana	1,523,000	425,000	1,948,000	1,680,032	201,764	66,204
Maryland	3,116	—	3,116	3,116	—	—
Michigan	6,300	5,800	12,100	8,300	2,170	1,630
Mississippi	193,000	73,000	266,000	163,167	62,598	40,235
Montana	25,000	4,000	29,000	28,255	127	618
Nebraska	12,000	6,000	18,000	12,515	355	5,130
New Mexico	328,000	237,000	565,000	540,664	2,773	21,563
New York	3,500	500	4,000	3,637	—	363
North Dakota	500	15,000	15,500	5,256	—	10,244
Ohio	32,000	3,000	35,000	33,756	55	1,189
Oklahoma	460,000	495,000	955,000	614,976	125,945	214,079
Pennsylvania	97,600	2,200	99,800	99,172	147	481
Texas	4,100,000	1,736,000	5,836,000	4,730,798	834,677	270,525
Utah	17,300	600	17,900	17,163	—	737
Virginia	968	—	968	968	—	—
West Virginia	209,000	5,000	214,000	212,403	116	1,481
Wyoming	35,000	65,000	100,000	77,819	6,868	15,313
Other States [4]	174	336	510	387	—	123
Total	7,841,958	3,877,836	11,719,794	9,405,351	1,540,804	773,639
1956						
Arkansas	16,000	37,000	53,000	30,162	16,269	6,569
California	144,000	623,000	767,000	504,458	254,872	7,670
Colorado	31,000	99,000	130,000	54,205	32,500	43,295
Illinois	700	28,300	29,000	6,177	1,870	20,953
Indiana	100	4,000	4,100	791	4	3,305
Kansas	519,000	68,000	587,000	526,091	2,141	58,768
Kentucky	71,000	4,000	75,000	73,687	—	1,313
Louisiana	1,720,000	430,000	2,150,000	1,886,302	190,768	72,930
Maryland	4,619	—	4,619	4,619	—	—
Michigan	9,500	5,500	15,000	10,911	2,498	1,591
Mississippi	206,000	82,000	288,000	185,137	66,654	36,209
Montana	21,000	6,000	27,000	25,847	145	1,008
Nebraska	16,500	9,000	25,500	13,541	850	11,109
New Mexico	425,000	239,000	664,000	626,340	1,470	36,190
New York	4,000	400	4,400	4,098	—	302
North Dakota	1,000	16,000	17,000	11,725	—	5,275
Ohio	26,000	4,000	30,000	25,368	57	4,575
Oklahoma	517,000	540,000	1,057,000	678,603	123,561	254,836
Pennsylvania	104,000	3,000	107,000	104,508	117	2,375
Texas	4,196,000	1,793,000	5,989,000	4,999,889	720,905	268,206
Utah	17,000	1,000	18,000	17,268	—	732
Virginia	2,941	—	2,941	2,926	—	15
West Virginia	202,000	4,000	206,000	204,717	127	1,156
Wyoming	52,000	70,000	122,000	84,398	11,840	25,762
Other States [4]	190	155	345	155	—	190
Total	8,306,550	4,066,355	12,372,905	10,081,923	1,426,648	864,334

[1] Marketed production plus quantities used in repressuring, vented, and wasted.
[2] Comprises gas sold or consumed by producers, including losses in transmission, quantities added to storage, and increases in gas in pipelines.
[3] Partly estimated. Includes direct waste on producing properties and residue blown to the air.
[4] Alabama, Arizona, Florida, Missouri, and Tennessee.

gas vented and wasted is compiled from data given on the reporting forms, supplemented by estimated waste derived from figures published by Natural Gas Reserves Committee of the American Gas Association and State conservation bodies.

UNDERGROUND STORAGE OF NATURAL GAS

The American Gas Association reported that 10 storage pools and 686 wells no longer producing were added to existing underground-storage facilities in 1956, bringing the total to 188 storage pools and 7,432 wells. The total capacity of underground natural-gas storage facilities at the end of 1956 was 3.4 trillion cubic feet—2.5 trillion cubic feet more than at the end of 1951 and 1.3 trillion cubic feet more than at the end of 1955. Twenty States had underground storage facilities at the end of the year.

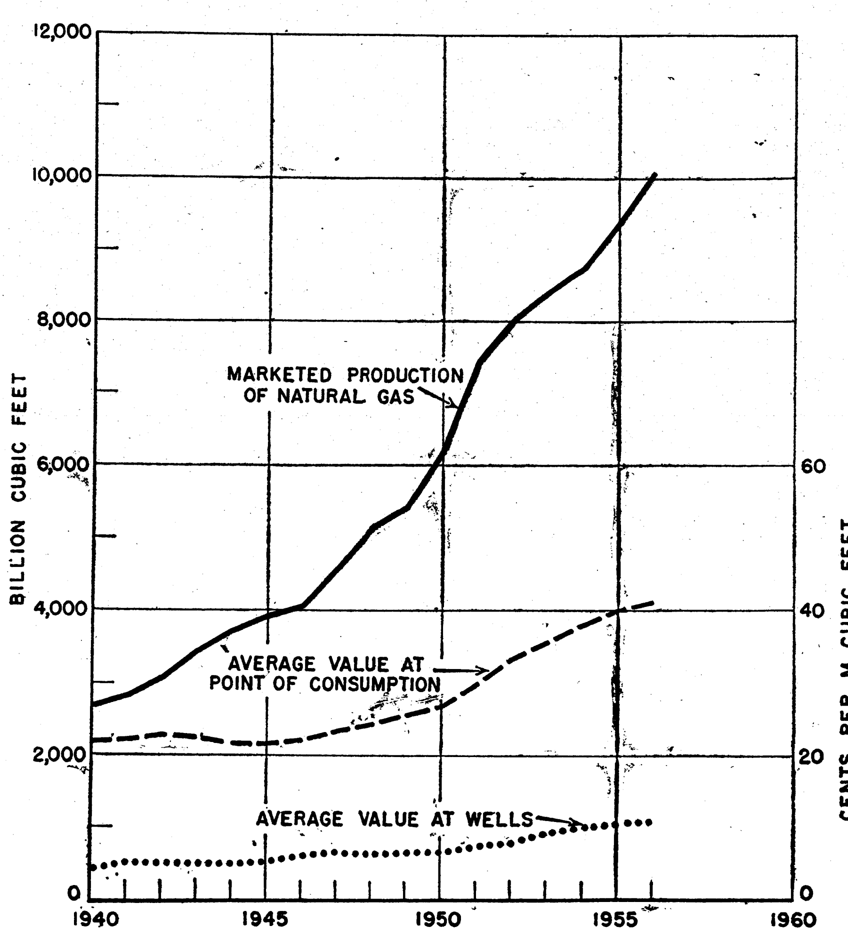

FIGURE 1.—Production and average value of natural gas in the United States, 1940–56.

TABLE 4.—Natural gas stored underground in and withdrawn from storage fields, 1955–56, by State of location, in million cubic feet

State	1955			1956		
	Total stored	Total withdrawn	Net stored	Total stored	Total withdrawn	Net stored
Arkansas				114	1	113
California	18,499	17,242	1,257	29,539	21,911	7,628
Colorado						
Illinois	12,682	1,978	10,704	10,900	1,684	9,216
Indiana	3,377	1,798	1,579	2,698	1,633	1,065
Iowa	41	238	−197	326	427	−101
Kansas	24,289	20,954	3,335	24,340	22,346	1,994
Kentucky	7,244	7,246	−2	7,985	6,653	1,332
Louisiana	232	24	208			
Maryland						
Michigan	69,189	76,281	−7,092	97,288	72,788	24,500
Mississippi	131	214	−83	2,541	1,407	1,134
Missouri	602		602	1,977	888	1,089
Montana	2,766	2,701	65	3,006	2,575	431
Nebraska	504	96	408		218	−218
New Mexico	6,789	7,264	−475	6,735	8,312	−1,577
New York	18,592	12,417	6,175	20,865	14,520	6,345
North Dakota						
Ohio	77,797	64,796	13,001	93,008	71,130	21,878
Oklahoma	19,141	14,456	4,685	24,227	17,441	6,786
Pennsylvania	138,256	108,068	30,188	142,272	112,356	29,916
Texas	14,030	18,184	−4,154	9,565	14,444	−4,879
Virginia						
West Virginia	88,695	79,412	9,283	108,540	79,084	29,456
Wisconsin	129		129	108		108
Wyoming	2,200	3,882	−1,682	3,198	2,944	254
Total	505,185	437,251	67,934	589,232	452,762	136,470

TABLE 5.—Marketed production of natural gas in the United States, 1952–56, by States [1]

State	Quantity (million cubic feet)					Change from 1955 (percent)	Estimated value at wells (thousand dollars)	
	1952	1953	1954	1955	1956		1955	1956
Alabama	4	41	87	282	42	−85.1	20	3
Arizona				15	21	40.0	1	3
Arkansas	42,325	41,510	33,471	32,123	30,162	−6.1	1,709	1,810
California	517,450	531,346	507,289	538,178	504,458	−6.3	119,476	113,503
Colorado	34,260	28,509	45,705	49,152	54,205	10.3	4,866	5,312
Florida	15	34	35	36	35	−2.8	4	3
Illinois	10,183	9,282	9,475	8,033	6,177	−23.1	1,036	933
Indiana	836	701	735	1,226	791	−35.5	152	96
Kansas	412,544	420,607	412,369	471,041	526,091	11.7	52,286	59,448
Kentucky	73,427	71,405	72,713	73,214	73,687	.6	17,352	17,022
Louisiana	1,237,143	1,293,644	1,399,222	1,680,032	1,886,302	12.3	189,844	215,038
Maryland	2,372	1,408	1,394	3,116	4,619	48.2	626	1,169
Michigan	9,052	7,774	6,962	8,300	10,911	31.5	955	1,451
Mississippi	174,100	154,254	140,448	163,167	185,137	13.5	15,664	18,143
Missouri	16	15	16	15	12	−20.0	3	2
Montana	28,714	27,889	30,252	28,255	25,847	−8.5	1,724	1,758
Nebraska	5,568	6,748	6,801	12,515	13,541	8.2	2,553	2,844
New Mexico	359,377	399,086	449,346	540,664	626,340	15.8	48,119	55,118
New York	3,627	2,347	2,598	3,637	4,098	12.7	1,073	1,160
North Dakota	369	498	1,093	5,256	11,725	123.1	405	950
Ohio	30,993	37,542	28,824	33,756	25,368	−24.8	7,595	6,088
Oklahoma	554,033	599,955	616,355	614,976	678,603	10.4	45,508	54,288
Pennsylvania	108,684	105,558	145,934	99,172	104,508	5.4	29,652	33,652
South Dakota	6	5	7					
Tennessee	107	89	89	39	45	15.4	5	6
Texas	4,147,505	4,383,158	4,551,232	4,730,798	4,999,889	5.7	378,464	434,990
Utah	3,006	7,075	16,024	17,163	17,268	.6	2,386	2,435
Virginia	1,133	3,697	1,401	968	2,926	202.3	259	811
West Virginia	180,995	186,477	191,601	212,403	204,717	−3.6	49,915	48,518
Wyoming	75,313	76,262	71,068	77,819	84,398	8.5	6,615	7,258
Total	8,013,457	8,396,916	8,742,546	9,405,351	10,081,923	7.2	978,357	1,083,812

[1] Comprises gas either sold or consumed by producers, including losses in transmission, quantities added to storage, and increases of gas in pipelines.

TABLE 6.—Gas wells in the United States, 1955–56 by States

State	Drilled during 1955 [1]	Producing Dec. 31, 1955	Drilled during 1956	Producing Dec. 31, 1956
Arkansas	10	240	13	255
California	64	470	51	465
Colorado	84	100	107	150
Illinois	16	30	63	40
Indiana	22	400	7	405
Kansas	362	5,100	381	5,450
Kentucky	162	4,100	165	4,200
Louisiana	282	3,600	401	4,000
Michigan	19	260	12	260
Mississippi	1	230	5	235
Missouri [2]				
Nebraska [2]	4	32	1	33
Montana	16	1,060	7	1,065
New Mexico	564	2,200	674	2,830
New York	2	1,180	14	1,160
Ohio	246	6,200	178	6,300
Oklahoma	359	4,200	321	4,300
Pennsylvania	214	16,300	236	16,250
Tennessee	1	28		28
Texas	603	11,400	894	12,240
West Virginia	460	14,000	506	14,200
Wyoming	46	220	52	265
Alabama, Maryland, North Dakota, South Dakota, Utah and Virginia	36	125	27	130
Total	3,573	71,475	4,115	74,261

[1] From Oil and Gas Journal.
[2] Combined to avoid disclosing individual company operations.

DEVELOPMENT AND PRODUCTION BY STATES

Kansas.—The State Geological Survey of Kansas reported that approximately 188 new fields and pools were discovered in 1956. Of this total, 152 were oil discoveries, 33 gas discoveries, and 3 oil and gas discoveries. One gas discovery and one oil and gas discovery were in eastern Kansas; the remaining discoveries were in western Kansas.

New Mexico.—Drilling activity in the San Juan basin of northwestern New Mexico and the Arizona-New Mexico Four Corners platform area in 1956 increased 32 percent over 1955.

Probably for the first time in the history of exploration in the San Juan basin, oil completions periodically exceeded gas completions. Of 61 wildcats drilled in the San Juan basin and Four Corners area, 34 were completed as discoveries; 20 were gas wells and 14 oil wells. The completion of the Pacific Northwest pipeline was largely responsible for bringing geophysical activity in the area to an all-time peak in 1956.

INTERSTATE SHIPMENTS AND EXPORTS

Interstate shipments, including exports, increased 10 percent in 1956. Shipments comprised 56 percent of marketed production in 1956 compared with 54 percent in 1955.

Montana received from Canada the only imports in 1956. Exports to Mexico were slightly below those in 1955, whereas exports to Canada increased 47 percent.

TABLE 7.—Marketed production, interstate shipments and total consumption of natural gas in 1956 in the United States, in million cubic feet

Census regions	Marketed production		Interstate movements		Transmission loss and unaccounted for	Change in storage	Consumption
	Quantity	Average value at wellhead	Quantity shipped	Quantity received			
New England:							
Connecticut				18,772	663		18,109
Maine							
Massachusetts				51,786	1,095		50,691
New Hampshire				1,464	19		1,445
Rhode Island				6,502	260		6,242
Vermont							
Total: 1956				78,524	2,037		76,487
1955				67,714	3,014		64,700
Middle Atlantic:							
New Jersey				93,882	3,790		90,092
New York	4,098	28.3	1,894	282,974	10,425	6,345	268,408
Pennsylvania	104,508	32.2	81,387	450,226	12,106	29,916	431,325
Total: 1956	108,606	32.1	83,281	827,082	26,321	36,261	789,825
1955	102,809	29.9	69,133	747,019	35,938	36,363	708,394
East North Central:							
Illinois	6,177	15.1	673	429,683	8,528	9,216	417,443
Indiana	791	12.1	430	149,176	8,337	1,065	140,135
Michigan	10,911	13.3		261,633	4,579	24,500	243,465
Ohio	25,368	24.0		562,352	4,285	21,878	561,557
Wisconsin				51,701	3,405	108	48,188
Total: 1956	43,247	19.8	1,103	1,454,545	29,134	56,767	1,410,788
1955	51,315	19.0	1,173	1,295,222	52,937	18,321	1,274,106
West North Central:							
Iowa				152,804	5,013	−101	147,892
Kansas	526,091	11.3	424,438	237,073	12,397	1,994	324,335
Minnesota				136,311	−520		136,831
Missouri	12	16.7		225,411	4,910	1,089	219,424
Nebraska	13,541	21.0		97,515	2,009	−218	109,265
North Dakota	11,725	8.1	3,226	2,003	74		10,428
South Dakota				17,849	−153		18,002
Total: 1956	551,369	11.5	427,664	868,966	23,730	2,764	966,177
1955	488,827	12.0	382,924	830,408	33,864	4,148	898,299
South Atlantic:							
Delaware				6,063	239		5,824
District of Columbia				16,223	390		15,833
Florida	35	8.3		35,617	330		35,322
Georgia				149,718	1,151		148,567
Maryland	4,619	25.3	1,867	45,052	251		47,553
North Carolina				17,696	1,117		16,579
South Carolina				45,328	861		44,467
Virginia	2,926	27.7	2,903	44,911	1,572		43,362
West Virginia	204,717	23.7	152,035	139,949	1,929	29,456	161,246
Total: 1956	212,297	23.8	156,805	500,557	7,840	29,456	518,753
1955	216,523	23.8	164,296	426,089	17,799	9,283	451,234
East South Central:							
Alabama	42	7.9		160,968	749		160,261
Kentucky	73,687	23.1	57,512	113,899	2,162	1,332	126,580
Mississippi	185,137	9.8	154,478	118,921	3,093	1,134	145,353
Tennessee	45	12.9		128,589	1,819		126,815
Total: 1956	258,911	13.6	211,990	522,377	7,823	2,466	559,009
1955	236,702	14.0	184,379	483,012	10,361	−85	525,059
West South Central:							
Arkansas	30,162	6.0	500	176,588	9,840	113	196,297
Louisiana	1,886,302	11.4	1,149,696	103,877	1,090		839,393
Oklahoma	678,603	8.0	316,183	23,953	20,657	6,786	358,930
Texas	4,999,889	8.7	2,752,071	117,333	46,183	−4,879	2,323,847
Total: 1956	7,594,956	9.3	4,218,450	421,751	77,770	2,020	3,718,467
1955	7,057,929	8.7	3,852,126	403,490	66,263	739	3,542,291

TABLE 7.—Marketed production, interstate shipments and total consumption of natural gas in 1956 in the United States, in million cubic feet—Continued

Census regions	Marketed production		Interstate movements		Trans-mission loss and unac-counted for	Change in stor-age	Con-sump-tion
	Quantity	Average value at wellhead	Quantity shipped	Quantity received			
Mountain:							
Arizona	21			108,720	2,881		105,860
Colorado	54,205	9.8	31,870	123,304	−1		145,640
Idaho				795	30		765
Montana	25,847	6.8	3,606	24,610	−1,270	431	47,690
Nevada				6,896	220		6,676
New Mexico	626,340	8.8	447,869	55,513	5,740	−1,577	229,821
Utah	17,268	14.1		37,953	552		54,669
Wyoming	84,398	8.6	45,760	8,852	1,684	254	45,552
Total: 1956	808,079	9.3	529,105	366,643	9,836	−892	636,673
1955	713,068	8.9	450,015	323,794	3,074	−2,092	585,865
Pacific:							
California	504,458	22.5		551,370	27,198	7,628	1,021,002
Oregon				4,910	437		4,473
Washington				6,090	866		5,224
Total: 1956	504,458	22.5		562,370	28,501	7,628	1,030,699
1955	538,178	22.2		507,157	23,683	1,257	1,020,395
Total United States: 1956	10,081,923	10.8	5,628,398	5,602,815	212,992	136,470	9,706,878
1955	9,405,351	10.4	5,104,046	5,083,905	246,933	67,934	9,070,343

TABLE 8.—Consumption of natural gas moving interstate, with imports and exports, by producing regions, 1956, in million cubic feet

Consuming regions and County or State	Quantity received	Producing region							
		Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Foreign
New England:									
Connecticut	18,772	1,322	16			745	16,689		
Massachusetts	51,786	3,570	44			1,974	46,198		
New Hampshire	1,464	47					1,417		
Rhode Island	6,502	517				320	5,665		
Total	78,524	5,456	60			3,039	69,969		
Middle Atlantic:									
New Jersey	93,882	3,790	61		47	2,507	87,477		
New York	282,974	56,627	39		5,381	3,659	217,268		
Pennsylvania	450,226	2,663	397		51,400	25,246	370,520		
Total	827,082	63,080	497		56,828	31,412	675,265		
East North Central:									
Illinois	429,683		216	26,981		65	402,421		
Indiana	149,176		8	22,603		141	126,424		
Michigan	261,633			48,459		92	213,082		
Ohio	562,352	13,954	319	28,052	71,045	35,773	413,209		
Wisconsin	51,701			937			50,764		
Total	1,454,545	13,954	543	127,032	71,045	36,071	1,205,900		
West North Central:									
Iowa	152,804			55,444			88,779	8,581	
Kansas	237,073			500			226,464	10,109	
Minnesota	136,311			63,299			62,430	10,582	
Missouri	225,411			66,615		90	158,706		
Nebraska	97,515			48,107			34,863	14,545	
North Dakota	2,003			216				1,787	
South Dakota	17,849			5,481			4,506	7,862	
Total	868,966			239,662		90	575,748	53,466	

TABLE 8.—Consumption of natural gas moving interstate, with imports and exports, by producing regions, 1956, in million cubic feet—Continued

Consuming regions and County or State	Quantity received	Producing region							
		Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Foreign
South Atlantic:									
Delaware	6,063					1	6,062		
District of Columbia	16,223	72			4,703	1,595	9,853		
Florida	35,617					9,212	26,405		
Georgia	149,718					49,495	100,223		
Maryland	45,052	279			11,051	4,552	29,170		
North Carolina	17,696					5	17,691		
South Carolina	45,328					9,377	35,951		
Virginia	44,911				10,848	4,297	29,766		
West Virginia	139,949	4	3		395	14,037	125,510		
Total	500,557	355	3		26,997	92,571	380,631		
East South Central:									
Alabama	160,968					46,403	114,565		
Kentucky	113,899				1,935	724	111,240		
Mississippi	118,921					395	118,526		
Tennessee	128,589					693	127,896		
Total	522,377				1,935	48,215	472,227		
West South Central:									
Arkansas	176,588					59	176,529		
Louisiana	103,877					476	103,401		
Oklahoma	23,953			3,534			20,206	213	
Texas	117,333					57	102,234	15,036	6
Total	421,751			3,534		592	402,370	15,249	6
Mountain:									
Arizona	108,720						60,134	48,586	
Colorado	123,304			51,523			68,895	2,886	
Idaho	795							795	
Montana	24,610			2,091				12,145	10,374
Nevada	6,896							6,896	
New Mexico	55,513						41,457	14,056	
Utah	37,953							37,953	
Wyoming	8,852			1,832			1,986	5,034	
Total	366,643			55,446			172,472	128,351	10,374
Pacific:									
California	551,370						232,063	319,307	
Oregon	4,910							4,910	
Washington	6,090							6,090	
Total	562,370						232,063	330,307	
Total United States	5,602,815	82,845	1,103	425,674	156,805	211,990	4,186,645	527,373	10,380
Canada	16,819	436		1,990			14,339	54	
Mexico	19,144						17,466	1,678	
Total	5,638,778	83,281	1,103	427,664	156,805	211,990	4,218,450	529,105	10,380

PIPELINES

Of the 6,381 miles of pipeline authorized in 1956, about one-fourth of the total, or 1,625 miles, was operating by the end of the year. Almost one-third of the aggregate horsepower of approved compressors was operating at the close of 1956.

Westcoast Transmission Co., Ltd.—Construction of the company 650-mile, 30-inch line was nearing completion at the end of the year. The line will extend from the gas fields in the Peace River area (in Alberta and British Columbia) to Vancouver, British Columbia, where it will connect with the line of the Pacific Northwest Pipeline Corp. Company deliveries to the Pacific Northwest are scheduled to begin late in 1957 and will reach 300 million cubic feet daily in 1958.

CONSUMPTION

At the end of 1956 the gas industry was servicing 30.1 million customers. Of these customers, 27.9 million were residential and 2.3 million commercial. Despite reduced housing construction during the year the average number of customers increased 2.9 million in 1956, largely because gas service was extended into new communities.

TABLE 9.—Consumption of natural gas in the United States, 1952–56, by States [1]

State	Quantity (million cubic feet)					Change from 1955 (percent)	Estimated value at points of consumption (thousand dollars)	
	1952	1953	1954	1955	1956		1955	1956
Alabama	125,874	136,825	139,551	151,325	160,261	5.9	56,226	64,244
Arizona	63,111	71,210	75,568	88,983	105,860	18.9	33,623	36,501
Arkansas	165,603	176,489	192,378	197,374	196,297	−.5	42,621	45,966
California	792,520	862,243	933,934	1,020,395	1,021,002	.1	445,181	470,301
Colorado	101,835	115,922	126,048	143,018	145,640	1.8	54,657	56,619
Connecticut	1,039	5,833	11,415	14,187	18,109	27.6	23,241	26,957
Delaware	2,276	1,972	2,980	4,280	5,824	36.1	4,899	6,665
District of Columbia	12,782	13,134	14,261	15,042	15,833	5.3	20,687	21,555
Florida	16,001	19,577	23,159	26,402	35,322	33.8	7,067	9,719
Georgia	108,329	122,742	132,069	133,044	148,567	11.7	53,841	74,378
Idaho	----------	----------	----------	----------	765	----------	----------	680
Illinois	344,705	350,980	391,408	398,718	417,443	4.7	226,874	248,914
Indiana	96,124	103,444	116,308	126,897	140,135	10.4	86,499	88,988
Iowa	94,951	106,755	119,876	138,661	147,892	6.7	65,132	72,516
Kansas	279,632	283,604	293,784	309,028	324,335	4.9	100,035	88,043
Kentucky	87,006	104,781	110,039	117,496	126,580	7.7	51,446	56,685
Louisiana	599,312	594,656	636,704	774,320	839,393	8.4	124,392	141,658
Maryland	26,468	29,470	35,010	39,889	47,553	19.2	49,463	57,700
Massachusetts	11,386	17,683	35,486	43,932	50,691	15.4	76,444	87,365
Michigan	163,991	178,307	188,922	207,005	243,465	17.6	166,341	200,089
Minnesota	97,591	104,508	115,140	123,734	136,831	10.6	67,353	80,613
Mississippi	119,638	118,617	136,797	138,186	145,353	5.2	35,820	40,839
Missouri	168,992	173,674	188,349	199,272	219,424	10.1	99,102	108,319
Montana	40,771	39,934	40,624	47,491	47,690	.4	17,452	17,560
Nebraska	78,544	83,384	93,189	102,177	109,265	6.9	47,547	50,162
Nevada	----------	----------	982	2,484	6,676	168.8	1,220	3,641
New Hampshire	316	857	1,065	1,206	1,445	19.8	1,976	2,449
New Jersey	40,409	58,685	65,718	74,601	90,092	20.8	109,341	132,408
New Mexico	194,748	200,039	177,221	215,281	229,821	6.8	33,142	38,443
New York	180,747	197,878	225,844	243,513	268,408	10.2	241,628	285,776
North Carolina	2,945	6,172	9,436	12,644	16,579	31.1	9,675	12,597
North Dakota	3,342	3,559	4,820	9,320	10,428	11.9	3,147	3,740
Ohio	393,250	420,809	442,523	500,865	561,557	12.1	300,938	342,638
Oklahoma	319,908	333,972	327,936	334,057	358,930	7.4	72,733	75,284
Oregon	----------	----------	----------	----------	4,473	----------	----------	5,535
Pennsylvania	324,187	335,457	353,185	390,280	431,325	10.5	286,823	304,734
Rhode Island	----------	670	4,423	5,375	6,242	16.1	13,125	14,541
South Carolina	2,896	8,772	16,573	23,043	44,467	93.0	12,301	19,179
South Dakota	11,701	13,688	15,564	16,107	18,002	11.8	8,319	9,153
Tennessee	99,817	106,130	114,869	118,052	126,815	7.4	51,044	54,712
Texas	2,175,100	2,194,172	2,198,175	2,236,540	2,323,847	3.9	350,247	365,873
Utah	30,929	34,592	41,073	48,903	54,669	11.8	19,676	21,227
Virginia	18,630	27,716	35,604	38,884	43,362	11.5	38,563	44,147
Washington	----------	----------	----------	----------	5,224	----------	----------	5,575
West Virginia	146,153	148,017	138,846	158,006	161,246	2.1	61,070	67,431
Wisconsin	33,632	36,339	39,287	40,621	48,188	18.6	45,450	51,808
Wyoming	36,287	36,070	36,709	39,705	45,552	14.7	9,685	10,861
Total	7,613,478	7,979,338	8,402,852	9,070,343	9,706,878	7.0	3,626,046	4,024,788

[1] Includes natural gas mixed with manufactured gas.

TABLE 10.—Residential and commercial consumption of natural gas in the United States in 1956, by States [1]

State	Residential				Commercial				Total			
	Number of consumers (thousand)	Quantity (million cubic feet)	Value at point of consumption: Total (thousand dollars)	Value at point of consumption: Average (cents per M cubic feet)	Number of consumers (thousand)	Quantity (million cubic feet)	Value at point of consumption: Total (thousand dollars)	Value at point of consumption: Average (cents per M cubic feet)	Number of consumers (thousand)	Quantity (million cubic feet)	Value at point of consumption: Total (thousand dollars)	Value at point of consumption: Average (cents per M cubic feet)
Alabama	389	30,767	29,645	96.4	30	11,830	6,376	53.9	419	42,597	36,021	84.6
Arizona and Nevada	228	13,933	13,790	99.0	26	7,583	4,479	59.1	254	21,516	18,269	84.9
Arkansas	237	22,926	13,555	59.1	35	11,456	4,968	43.4	272	34,382	18,523	53.9
California	3,666	294,129	237,278	80.7	292	91,425	52,646	57.6	3,958	385,554	289,924	75.2
Colorado	297	33,103	25,665	77.5	38	17,632	11,028	62.5	335	50,735	36,693	72.3
Connecticut	346	10,129	18,723	184.8	19	1,838	3,204	174.3	365	11,967	21,927	183.2
Delaware, District of Columbia, and Maryland	690	45,647	64,540	141.4	51	8,610	11,291	131.1	741	54,257	75,831	139.8
Florida	25	2,125	1,828	86.0	2	339	258	76.1	27	2,464	2,086	84.7
Georgia	398	38,422	41,792	108.8	38	14,763	7,777	52.7	436	53,185	49,569	93.2
Idaho and Oregon	15	3,414	4,455	130.5	3	699	832	119.0	18	4,113	5,287	128.5
Illinois	1,943	142,689	147,366	103.3	105	25,840	20,405	79.0	2,048	168,529	167,771	99.6
Indiana	660	49,761	48,998	98.5	50	12,410	10,353	83.4	710	62,171	59,351	95.5
Iowa	344	44,184	36,394	82.4	37	18,515	10,915	59.0	381	62,699	47,309	75.5
Kansas	438	58,517	32,533	55.6	54	34,196	13,651	39.9	492	92,713	46,184	49.8
Kentucky	332	43,662	29,435	67.4	36	13,358	7,791	58.3	368	57,020	37,226	65.3
Louisiana	579	39,634	25,547	64.5	49	16,320	7,415	45.4	628	55,954	32,962	58.9
Massachusetts	901	29,789	65,999	221.6	52	6,033	12,097	200.5	953	35,822	78,096	218.0
Michigan	1,308	155,140	145,918	94.1	79	20,313	17,495	86.1	1,387	175,453	163,413	93.1
Minnesota	352	51,884	48,936	94.3	25	35,879	17,809	49.6	377	87,763	66,745	76.1
Mississippi	215	18,384	14,069	76.5	28	9,871	4,333	43.9	243	28,255	18,402	65.1
Missouri	702	89,724	67,396	75.1	39	16,232	10,826	66.7	741	105,956	78,222	73.8
Montana	91	15,319	8,962	58.5	10	9,365	3,859	41.2	101	24,684	12,821	51.9
Nebraska	225	31,745	24,774	78.0	29	15,917	8,839	55.5	254	47,662	33,613	70.5
New Hampshire	29	1,078	1,890	175.3	2	315	478	151.7	31	1,393	2,368	170.0
New Jersey	1,296	50,425	102,304	202.9	88	6,822	10,783	158.1	1,384	57,247	113,087	197.5
New Mexico	128	13,360	9,901	74.1	15	6,418	2,831	44.1	143	19,778	12,732	64.4
New York	4,155	165,196	202,771	122.7	351	43,649	44,701	102.4	4,506	208,845	247,472	118.5
North Carolina	59	3,364	5,719	170.0	8	1,473	2,301	156.2	67	4,837	8,020	165.8
North Dakota and South Dakota	63	8,005	6,364	79.5	8	6,270	3,309	52.8	71	14,275	9,673	67.8
Ohio	1,896	305,157	208,107	68.2	153	76,280	49,391	64.7	2,049	381,437	257,498	67.5
Oklahoma	507	51,265	31,580	61.6	56	25,392	9,722	38.3	563	76,657	41,302	53.9
Pennsylvania	1,894	187,620	172,489	91.9	116	39,323	29,799	75.8	2,010	226,943	202,288	89.1
Rhode Island	154	4,029	10,407	258.3	5	1,256	2,634	209.7	159	5,285	13,041	246.8

South Carolina	52	2,242	4,247	189.4	8	1,237	1,758	142.1	60	3,479	6,005	172.6
Tennessee	260	25,382	21,569	85.0	33	15,940	9,151	57.4	293	41,322	30,720	74.3
Texas	1,824	129,476	93,856	72.5	185	53,084	23,236	43.8	2,009	182,560	117,092	64.1
Utah	118	13,098	8,592	65.6	14	6,500	3,200	49.2	132	19,598	11,792	60.2
Virginia	299	18,622	28,612	153.6	23	7,308	7,465	102.1	322	25,930	36,077	139.1
Washington	7	2,096	2,746	131.0	----------	833	1,000	120.0	7	2,929	3,746	127.9
West Virginia	307	45,350	26,308	58.0	30	13,380	6,972	52.1	337	58,730	33,280	56.7
Wisconsin	404	28,357	36,432	128.5	27	5,460	6,155	112.7	431	33,817	42,587	125.9
Wyoming	54	8,415	4,622	54.9	6	5,507	1,945	35.3	60	13,922	6,567	47.2
Total: 1956	27,887	2,327,564	2,126,114	91.3	2,255	716,871	465,478	64.9	30,142	3,044,435	2,591,592	85.1
1955	26,084	2,123,952	1,884,946	88.7	[2] 2,140	629,219	394,790	62.7	28,224	2,753,171	2,279,736	82.8

[1] Includes natural gas mixed with manufactured gas.
[2] Revised due to correction for Florida.

TABLE 11.—Industrial consumption of natural gas in the United States, by States and uses

(Volume in million cubic feet, value in thousand dollars, and average value in cents per thousand cubic feet)

State	Field, pumping, drilling, etc.			Carbon black			Fuel						Total industrial			Fuel used at electric utility plants [1]
	Volume	Value	Average value	Volume	Value at point of consumption		Refinery fuel	Natural-gas pipeline	Other industrial	Total fuel	Value at point of consumption		Volume	Value at point of consumption		
					Value	Average value					Value	Average value		Value	Average value	
Alabama	53	6	11.3					6,915	110,696	117,611	28,217	24.0	117,664	28,223	24.0	18,900
Arizona and Nevada	21	3	14.3					11,117	79,882	90,999	21,870	24.0	91,020	21,873	24.0	39,428
Arkansas	20,519	1,967	9.6				9,991	4,846	126,559	141,396	25,476	18.0	161,915	27,443	16.9	46,765
California	160,451	27,523	17.2	(2)	(2)	(2)	90,820	10,496	373,681	474,997	152,854	32.2	635,448	180,377	28.4	150,388
Colorado	12,587	609	4.8				1,292	1,196	79,830	82,318	19,317	23.5	94,905	19,926	21.0	34,847
Connecticut								40	6,102	6,142	5,030	81.9	6,142	5,030	81.9	1,848
Delaware, District of Columbia, and Maryland	3	1	33.3					887	14,063	14,950	10,088	67.5	14,953	10,089	67.5	2,312
Florida	35	4	11.4						32,823	32,823	7,629	23.2	32,858	7,633	23.2	11,793
Georgia								3,206	92,176	95,382	24,809	26.0	95,382	24,809	26.0	37,677
Idaho and Oregon								78	1,047	1,125	928	82.5	1,125	928	82.5	
Illinois	24,783	6,563	26.5				12,729	11,239	200,163	224,131	74,580	33.3	248,914	81,143	32.6	55,190
Indiana	73	8	11.0				1,669	6,721	69,501	77,891	29,629	38.0	77,964	29,637	38.0	8,719
Iowa								6,894	78,299	85,193	25,207	29.6	85,193	25,207	29.6	40,023
Kansas	33,096	4,271	12.9	(2)	(2)	(2)	14,734	34,593	149,199	198,526	37,588	18.9	231,622	41,859	18.1	70,242
Kentucky	11,464	1,650	14.4				(3)	15,056	43,040	58,096	17,809	30.7	69,560	19,459	28.0	4,846
Louisiana	166,349	15,767	9.5	28,706	2,298	8.0	104,915	19,413	464,056	588,384	90,631	15.4	783,439	108,696	13.9	73,199
Massachusetts								421	14,448	14,869	9,269	62.3	14,869	9,269	62.3	7,534
Michigan	2,217	595	26.8				1,252	2,239	62,304	65,795	36,081	54.8	68,012	36,676	53.9	413
Minnesota							(3)	178	48,890	49,068	13,868	28.3	49,068	13,868	28.3	35,117
Mississippi	14,254	1,944	13.6				(3)	20,813	82,031	102,844	20,493	19.9	117,098	22,437	19.2	33,076
Missouri	15	3	20.0				(3)	7,853	105,600	113,453	30,094	26.5	113,468	30,097	26.5	27,644
Montana	3,427	344	10.0				2,452	372	16,755	19,579	4,395	22.4	23,006	4,739	20.6	831
Nebraska	3,183	410	12.9				(3)	4,568	53,852	58,420	16,139	27.6	61,603	16,549	26.9	23,195
New Hampshire									52	52	81	155.8	52	81	155.8	
New Jersey								225	32,620	32,845	19,321	58.8	32,845	19,321	58.8	9,187
New Mexico	105,197	10,938	10.4	49,429	3,493	7.1	1,620	11,102	42,695	55,417	11,280	20.4	210,043	25,711	12.2	25,021
New York	1,090	407	37.3				7	1,038	57,428	58,473	37,897	64.8	59,563	38,304	64.3	26,403
North Carolina								2,073	9,669	11,742	4,577	39.0	11,742	4,577	39.0	
North Dakota and South Dakota	5,039	556	11.0				(3)	66	9,050	9,116	2,664	29.2	14,155	3,220	22.7	3,394
Ohio	1,641	459	28.0				3,694		174,785	178,479	84,681	47.4	180,120	85,140	47.3	4,529

Oklahoma	155, 216	13, 035	8. 4	-------	-------	-------	53, 759	8, 891	64, 407	127, 057	20, 947	16. 5	282, 273	33, 982	12. 0	73, 936
Pennsylvania	5, 628	2, 122	37. 7	-------	-------	-------	18, 794	7, 854	172, 106	198, 754	100, 324	50. 5	204, 382	102, 446	50. 1	889
Rhode Island	-------	-------	-------	-------	-------	-------	(3)	63	894	957	1, 500	156. 7	957	1, 500	156. 7	69
South Carolina	-------	-------	-------	-------	-------	-------	-------	1, 061	39, 927	40, 988	13, 174	32. 1	40, 988	13, 174	32. 1	31, 369
Tennessee	9	1	11. 1	-------	-------	-------	(3)	10, 478	75, 006	85, 484	23, 991	28. 1	85, 493	23, 992	28. 1	2, 577
Texas	651, 373	49, 745	7. 6	154, 580	11, 434	7. 4	346, 369	72, 609	916, 356	1, 335, 334	187, 602	14. 0	2, 141, 287	248, 781	11. 6	321, 639
Utah	355	23	6. 5	-------	-------	-------	454	7	34, 255	34, 716	9, 412	27. 1	35, 071	9, 435	26. 9	12, 739
Virginia	94	31	33. 0	-------	-------	-------	-------	2, 288	15, 050	17, 338	8, 039	46. 4	17, 432	8, 070	46. 3	997
Washington	-------	-------	-------	-------	-------	-------	-------	88	2, 207	2, 295	1, 829	79. 7	2, 295	1, 829	79. 7	-------
West Virginia	34, 260	9, 608	28. 0	-------	-------	-------	1, 085	7, 599	59, 572	68, 256	24, 543	36. 0	102, 516	34, 151	33. 3	1, 380
Wisconsin	-------	-------	-------	-------	-------	-------	(3)	445	13, 926	14, 371	9, 221	64. 2	14, 371	9, 221	64. 2	122
Wyoming	18, 001	1, 972	10. 9	-------	-------	-------	8, 026	944	4, 659	13, 629	2, 322	17. 0	31, 630	4, 294	13. 6	1, 073
Total 1956 [2]	1, 420, 550	149, 162	10. 5	242, 598	18, 628	7. 7	679, 343	295, 972	4, 023, 980	4, 999, 295	1, 265, 406	25. 3	6, 662, 443	1, 433, 196	21. 5	1, 239, 311
Total 1955	1, 507, 671	152, 595	10. 1	244, 794	19, 398	7. 9	625, 243	245, 246	3, 694, 218	4, 564, 707.	1, 174, 317	25. 7	6, 317, 172	1, 346, 310	19. 6	1, 153, 280

[1] Federal Power Commission. Includes gas other than natural impossible to segregate and therefore shown separately.
[2] 9,883 million cubic feet and $1,403 in value included in field use to avoid disclosure; included in total carbon black.
[3] 5,681 million cubic feet included in other industrial to avoid disclosure; included in total refinery fuel; also includes gas used by portland-cement industry.

The quantities used by various classes of consumers in 1956 increased over 1955 as follows: Residential 9.6 percent, commercial 14 percent, petroleum refineries 8.6 percent, natural-gas pipelines 20.7 percent, and other industrial (which includes electric utility plants and portland-cement plants) 8.9 percent. Field use decreased 6 percent in 1956. The portland-cement industry consumed 144 billion cubic feet in 1956, or 9.7 percent more than in 1955.

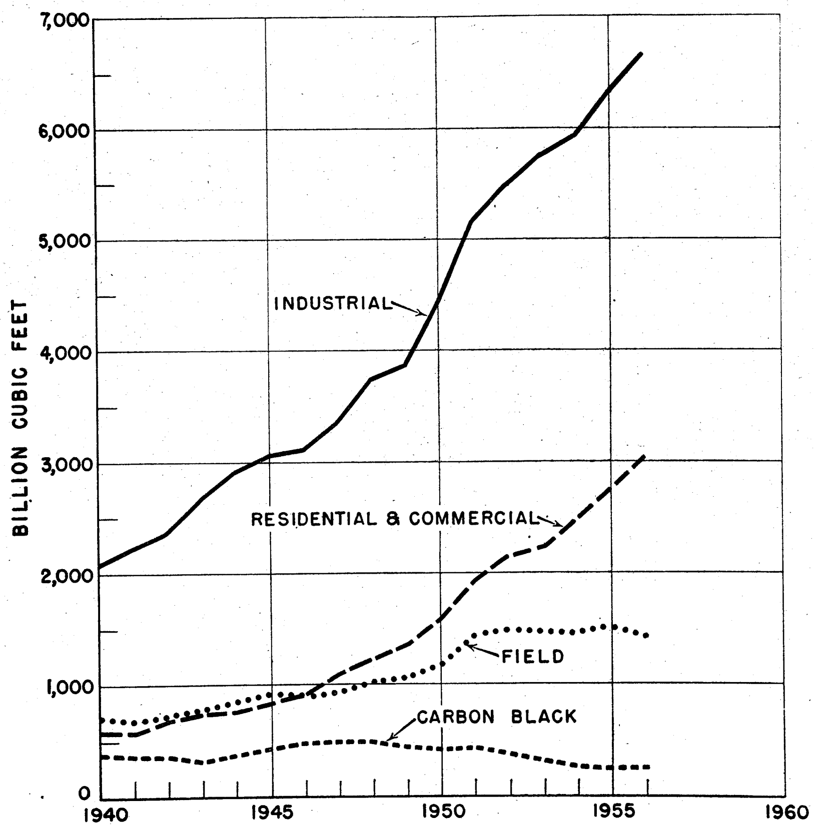

FIGURE 2.—Consumption of natural gas, by uses, in the United States, 1940–56.

TABLE 12.—Natural gas treated at natural-gasoline and cycle plants in the United States, 1955–56, by States, in million cubic feet

State	1952	1953	1954	1955	1956
Arkansas	77,317	71,257	64,561	56,092	48,233
California	523,115	580,191	571,702	570,806	572,749
Colorado	(1)	(2)	[3] 36,169	[3] 43,911	[3] 49,052
Illinois	[4] 12,317	[4] [5] 73,157	[5] [6] 159,225	[6] 165,739	[6] 175,618
Kansas	403,376	[7] 431,998	[7] 400,791	426,533	407,749
Kentucky	268,096	[5] 277,145	[5] 370,111	[5] 389,696	[5] 406,260
Louisiana	607,564	591,626	627,006	775,761	839,274
Michigan	(4)	(4)	(6)	(6)	(6)
Mississippi	53,050	135,935	120,533	140,040	144,227
Montana	(1)	(2)	(3)	(3)	(3)
Nebraska	(1)	(7)	(7)	18,397	[7] 21,211
New Mexico	279,286	324,721	439,556	467,505	578,468
New York	-------	-------	-------	-------	-------
Ohio	9,011	(8)	(6)	(6)	(6)
Oklahoma	444,425	476,094	540,822	562,749	620,901
Pennsylvania	32,235	[8] 20,935	20,201	17,316	13,949
Texas	3,420,398	3,619,335	3,843,718	4,187,003	4,463,158
Utah	(1)	(2)	(3)	(3)	(3)
West Virginia	215,485	160,170	205,151	225,307	181,772
Wyoming	46,848	[2] 74,718	60,372	139,098	67,542
Other States	[1] 26,074	-------	-------	-------	-------
Total	6,418,597	6,837,282	7,459,918	8,185,953	8,590,163

[1] Colorado, Montana, Nebraska, and Utah combined under "Other States" to avoid disclosing individual State data.
[2] Colorado, Montana, and Utah included in Wyoming.
[3] Montana and Utah included in Colorado.
[4] Michigan included in Illinois.
[5] Includes gas from transmission lines previously treated in other States.
[6] Michigan and Ohio included in Illinois.
[7] Nebraska included in Kansas in 1953; Nebraska and North Dakota included in Kansas in 1954; North Dakota included in Nebraska in 1955 and 1956.
[8] Ohio included in Pennsylvania.

TABLE 13.—Consumption of natural gas used with manufactured gas in the United States in 1956, by States [1]

State	Residential		Commercial		Industrial	Total	
	Number of consumers (thousand)	Quantity (million cubic feet)	Number of consumers (thousand)	Quantity (million cubic feet)	Quantity (million cubic feet)	Quantity (million cubic feet)	Value at point of consumption (thousand dollars)
Connecticut	145	3,110	9	597	1,061	4,768	5,406
Delaware and Maryland	-------	-------	-------	-------	-------	-------	-------
Illinois	926	46,361	41	9,887	22,543	78,791	64,789
Indiana	384	21,289	25	4,981	32,705	58,975	42,183
Massachusetts	291	5,290	21	1,850	1,800	8,940	19,880
New Jersey	855	32,450	70	4,510	7,040	44,000	73,040
New York	1,134	46,605	104	9,224	9,073	64,902	49,224
Pennsylvania	313	26,341	20	3,237	5,619	35,197	34,975
Tennessee	-------	-------	-------	-------	-------	-------	-------
Virginia	-------	-------	-------	-------	-------	-------	-------
Total: 1956	4,048	181,446	290	34,286	79,841	295,573	289,497
1955	4,372	198,512	302	33,390	72,703	304,605	317,732

[1] Included in tables for consumption of natural gas (tables 9–12).

VALUE AND PRICE

The average value of natural gas at the wellhead in 1956 was 10.8 cents per thousand cubic feet, a 0.4-cent increase over 1955. Of the five leading producing States in 1956, Texas, Oklahoma, and New Mexico reported an average value less than the national average. The average values of residential, commercial, and industrial gas at point of consumption all increased in 1956.

TABLE 14.—Average value of natural gas in the United States, 1955–56, by States, in cents per thousand cubic feet

State	At wells (estimated)		At point of consumption		State	At wells (estimated)		At point of consumption	
	1955	1956	1955	1956		1955	1956	1955	1956
Alabama	7.1	7.9	37.2	40.1	Nebraska	20.4	21.0	46.5	45.9
Arizona		14.0	37.8	34.5	Nevada			49.1	54.5
Arkansas	5.6	6.0	21.6	23.4	New Hampshire			163.8	169.5
California	22.2	22.5	43.6	46.1	New Jersey			146.6	147.0
Colorado	9.9	9.8	38.2	38.1	New Mexico	8.9	8.8	15.4	16.7
Connecticut			163.8	148.9	New York	29.5	28.3	99.2	106.5
Delaware			114.5	114.4	North Carolina			76.5	76.0
District of Columbia			137.5	136.1	North Dakota	7.7	8.1	33.8	35.9
Florida	10.4	8.3	26.8	27.5	Ohio	22.5	24.0	60.1	61.0
Georgia			40.5	50.1	Oklahoma	7.4	8.0	21.8	21.0
Idaho				88.9	Oregon				123.7
Illinois	12.9	15.1	56.9	59.6	Pennsylvania	29.9	32.2	73.5	70.7
Indiana	12.4	12.1	68.2	63.5	Rhode Island			244.2	233.0
Iowa			47.0	49.0	South Carolina			53.4	43.1
Kansas	11.1	11.3	32.4	27.1	South Dakota			51.4	50.8
Kentucky	23.7	23.1	43.8	44.8	Tenessee	12.9	12.9	43.2	43.1
Louisiana	11.3	11.4	16.1	16.9	Texas	8.0	8.7	15.7	15.7
Maryland	20.1	25.3	124.0	121.3	Utah	13.9	14.1	40.2	38.8
Massachusetts			174.1	172.3	Virginia	26.8	27.7	99.2	101.8
Michigan	11.5	13.3	80.4	82.2	Washington				106.7
Minnesota			54.4	58.9	West Virginia	23.5	23.7	38.7	41.8
Mississippi	9.6	9.8	25.9	28.1	Wisconsin			111.9	107.5
Missouri	20.0	16.7	49.7	49.1	Wyoming	8.5	8.6	24.4	23.8
Montana	6.1	6.8	36.7	36.8	Total	10.4	10.8	40.0	41.5

TABLE 15.—Consumption of natural gas,[1] 1951–55, by countries, in million cubic meters

[United Nations Statistical Yearbook]

Country	1951	1952	1953	1954	1955
Western Hemisphere:					
Argentina	830	898	932	(2)	(2)
Barbados	3	4	4	3	3
Canada	2,250	2,511	2,860	3,419	4,069
Chile	(2)	(2)	36	96	(2)
Colombia [3]	489	204	484	545	539
Ecuador [4]	752	(2)	(2)	(2)	(2)
Mexico [5]	1,411	1,532	(2)	(2)	(2)
Trinidad	471	478	501	515	498
United States	211,170	226,917	237,775	247,563	263,858
Venezuela	1,440	1,756	2,168	2,443	2,749
Europe:					
Austria [6]	49	49	56	75	[8] 749
Czechoslovakia	(2)	(2)	(2)	(2)	(2)
Denmark	(2)	(2)	(2)	(2)	(2)
France	282	266	244	259	278
Germany [7]	84	96	104	150	309
Italy	966	1,433	2,280	2,967	3,622
Poland	(2)	(2)	(2)	(2)	(2)
Rumania	(2)	(2)	(2)	(2)	(2)
Russia [9]	6,840	7,372	8,010	8,783	10,355
Yugoslavia	13	14	73	90	55
Asia:					
Brunei	1,039	1,094	1,173	1,098	741
China	30	28	31	29	28
Indonesia	785	1,069	1,366	1,582	1,908
Japan	83	91	111	141	156
Pakistan	11	29	44	(2)	(2)
Africa: Morocco	(2)	(2)	4	8	(2)

[1] The data relate, as far as possible, to natural gas actually collected and used as fuel or raw material. Thus they exclude gas used for repressuring, as well as gas flared, vented, or otherwise wasted, whether or not it has first been processed for extracting natural gasoline. Natural gas is produced also in Czechoslovakia, Hungary, Poland, Rumania, the U. S. S. R., Peru, and other countries.
[2] Data not available. [3] Includes gas repressured.
[4] Total production, including gas repressured and waste.
[5] Includes gas repressured and gas delivered to absorption plants.
[6] Vienna only. [7] Figures represent virtually total German production.
[8] Figures represent total production in Austria.
[9] Includes U. S. S. R. in Asia and unspecified quantity of manufactured gas.

WORLD REVIEW

The Canadian Department of Mines and Technical Survey reports that the gross production of natural gas in Canada in 1956 was 169,543 million cubic feet compared with 150,772 million cubic feet in 1955. By the end of 1956 reserves were over 23 trillion cubic feet—a fivefold increase since 1950. The Canadian natural-gas industry in 1956 completed preparations and commenced construction work on a crosscountry pipeline transmission and distribution system. The establishment of long-distance transportation will link the natural gas resources of western Canada with markets throughout Canada, and the pattern of gas distribution will begin to change.

TECHNOLOGY [1]

Completion of 8,740 miles of new natural-gas pipelines during 1956 caused part of the increase in gas consumption in 1956. Areas that formerly had no outlets or limited ones for gas production were able to send gas to markets that had not been served by natural-gas lines. Noteworthy during the year was completion of the pipeline of the Pacific Northwest Pipeline Co. from the San Juan basin of Utah to the Pacific Northwest. Offsetting the increased cost of transmission lines were technologic improvements adopted in 1956. Less steel was required because higher strength steel was used in pipelines. Pipe of low-tensile steel such as API–5L was supplanted largely by higher tensile-strength pipe of grades API–5LX, X–42, and X–52. Thinner wall sections made possible thereby saved considerable weight. Double-jointing techniques were adopted which involved machine-manual and automatic welding of pipe in yards before the pipe was transported to the field. Another improvement adopted was a ditch-padding machine which placed a soft covering of dirt over rocks to prevent damage to the pipe or pipe covering. Improved plastic tapes and other pipe coverings, as well as asphalt-rubber mastic materials for underwater lines, were introduced. These and related materials promised to be effective in protecting underwater pipe or pipe laid in other corrosive mediums.

Transmission-line compressors of the reciprocating type long have been troublesome because of pulsating flow and consequent vibration and metering difficulties. Centrifugal compressors alleviated these difficulties and gained acceptance in 1956 because of their mechanical simplicity, high capacity per machine, efficiency, and ease of control. These compressors are suitable for gas-turbine, electric, gas- or diesel-engine, and steam-turbine drives. A significant development was the adoption of centrifugal compressors by one gas-transmission company as initial equipment on a new, large transmission line. Previously centrifugal compressors had been installed cautiously to supplement reciprocating compressors.

Several companies made experimental installations of automatic, remotely controlled gas-pumping stations in 1956. Stations having both gas-turbine and reciprocating-engine drives were installed. Because of their design, operating characteristics, and flexibility, gas

[1] By J. D. Lankford.

turbines appeared to be favored for remote-control stations, although considerable progress was made on stations with reciprocating-engine drives. At the outset the industry approached automatic station adoption with caution. Stations with one attendant, in case of trouble, were favored over unattended stations.

Producing techniques using formation fracturing were used widely by gas producers, as well as oil producers, in 1956. Fracturing was found to be especially appropriate in the San Juan basin, where tight formations have proved restrictive.

Natural-Gas Liquids

By I. F. Avery, A. T. Coumbe, L. V. Harvey, and E. R. Eliff

Contents

GENERAL SUMMARY

THE PRODUCTION of natural-gas liquids in 1956 increased 4 percent to 12.3 billion gallons. Production of liquefied-petroleum (LP-) gases was 9 percent greater than in 1955. Stocks of natural-gas liquids at plants, terminals, and refineries increased 294 million gallons during the year. Of this, 287 million gallons of LP-gas was placed in underground storage.

Sales of LP-gases, including liquefied refinery (LR-) gases, for all uses other than blending in gasoline increased 8 percent in 1956.

SCOPE OF REPORT

Statistics on the production of natural-gas liquids were collected on both monthly and annual questionnaires from all natural-gasoline plants, cycling plants, and fractionators handling natural-gas liquids. Reports were not received for the liquids recovered at pipeline compressor stations and at gas-dehydration plants. Reports were received on the production of field condensate when this material was not commingled with the crude oil. Field condensate delivered to a plant and fractionated into finished products was reported as output of finished products.

The monthly reports provided data on production, stocks, and distribution. The annual reports provided data on type of plant, production, value of production, and gas processed. Data on sales of LP-gases for fuel and chemical uses included propane, propylene, butanes, butylenes, ethane, and ethane mixtures produced at natural-gasoline plants and at petroleum refineries but did not include LP-gas that was blended into gasoline motor fuel. Information is collected on an annual questionnaire received from all producers and distributors and from 90 percent of the dealers selling over 100,000 gallons of LP-gases a year. Data on smaller or nonreporting dealers are indirectly included in the reporting, as the sales figures of producers or distributors will reflect the operations of these dealers.

RESERVES

The American Gas Association Reserves Committee estimated the proved recoverable reserves of natural-gas liquids on December 31, 1956, at 5.9 billion barrels. The increase of 0.5 billion barrels for the year was due principally to liquids associated with oil. Texas and Louisiana increased reserves 11 and 8 percent, respectively, the largest reported.

TABLE 1.—Salient statistics of the natural-gas-liquids industry in the United States, 1952–56, in thousand gallons

	1952	1953	1954	1955	1956
Production:					
Natural gasoline and natural-gasoline mixtures	3,665,760	3,858,918	[1] 4,104,828	[1] 4,457,079	[1] 4,438,890
LP-gases	4,285,386	4,692,870	5,204,304	5,972,698	6,487,413
Finished gasoline and naphtha	900,312	904,176	733,068	823,103	832,915
Other products	536,172	564,354	547,386	564,722	535,295
Total	9,387,630	10,020,318	10,589,586	11,817,602	12,294,513
Receipts from outside sources (refineries)	83,916	98,826	(2)	(2)	(2)
Shipments for use in gasoline:					
To refineries and jobbers	5,943,630	6,104,070	[2] 6,134,771	[2] 7,059,737	[2] 6,990,389
Exports	(3)	(3)	(3)	(3)	(3)
Losses	(3)	(3)	(3)	----	----
Transfers to nongasoline uses:					
LP-gases	[4] 3,347,736	[4] 3,717,504	[4] [5] 4,132,536	[4] [5] 4,549,681	[4] [5] 4,796,743
Other products	172,620	177,912	200,427	220,107	207,768
Stocks at plants, terminals, and refineries:					
Natural gasoline	153,888	187,236	171,671	165,799	194,757
LP-gases	107,142	171,150	308,528	300,129	587,094
Other products	66,864	79,590	109,407	103,775	81,627
Total	327,894	437,976	589,606	569,703	863,478
Value of natural-gas liquids at plants thousand dollars	533,160	597,840	581,412	619,006	697,143
Average value per gallon cents	5.7	6.0	5.5	5.2	5.7
Natural gas processed million cubic feet	6,418,597	6,837,282	7,458,485	8,185,953	8,590,163
Average yield, all light products gallons per M cubic feet	1.46	1.47	1.42	1.44	1.43
Sales to consumers for fuel and chemical uses:					
LP-gases	3,215,184	3,590,067	3,785,781	4,227,711	4,528,356
LR-gases [6]	1,262,184	1,341,942	1,339,752	1,768,772	2,107,407
Total	4,477,368	4,932,009	5,125,533	[7] 5,996,483	[7] 6,635,763
Exports of natural gasoline, LP-gases, and LR-gases	[8] 168,402	164,557	189,216	183,155	187,882

[1] Includes isopentane. Isopentane included in LP-gases in previous years.
[2] "Receipts from outside sources" has been eliminated from supply and shipments.
[3] Natural gasoline exports and losses included in "Shipments for use in gasoline: To refineries and jobbers."
[4] Includes ethane.
[5] Includes LP-gas exports.
[6] LR-gases.
[7] Ethane is excluded from "Sales to consumers for fuel and chemical uses" before 1955.
[8] Revised figure.

TABLE 2.—Estimated proved recoverable reserves of natural-gas liquids [1] in the United States, 1955–56, in thousand barrels

[Committee on Natural Gas Reserves, American Gas Association]

State	Reserves as of Dec. 31, 1955	Changes in reserves during 1956			Reserves as of Dec. 31, 1956			
		Extensions and revisions	Discoveries of new fields and new pools in old fields	Net production	Nonassociated with oil	Associated with oil	Dissolved in oil	Total
Arkansas	45,124	338	18	3,013	12,210	16,212	14,045	42,467
California [2]	324,941	16,548	663	30,424	----------	96,117	215,611	311,728
Colorado	12,511	−129	----------	837	2,714	----------	8,831	11,545
Illinois	18,457	464	92	2,241	28	2	16,742	16,772
Indiana	132	17	5	21	10	10	113	133
Kansas	173,236	2,111	1,944	5,676	166,380	1,374	3,861	171,615
Kentucky	8,675	291	145	1,860	[3] 7,251	----------	----------	7,251
Louisiana [2]	935,950	98,628	23,589	43,225	791,284	169,842	53,816	1,014,942
Michigan	872	178	134	116	228	103	737	1,068
Mississippi	57,876	−215	1,421	3,079	29,729	20,552	5,722	56,003
Montana	6,857	1,550	----------	262	----------	----------	8,145	8,145
Nebraska	6,436	436	183	551	4,859	735	910	6,504
New Mexico	342,207	84,574	2,489	15,171	283,464	51,781	78,854	414,099
Ohio	1,557	120	13	21	[3] 1,669	----------	----------	1,669
Oklahoma	354,354	26,131	5,963	30,860	116,937	58,398	180,253	355,588
Pennsylvania	3,024	178	89	124	[3] 3,167	----------	----------	3,167
Texas [2]	3,045,361	476,364	57,037	198,873	1,346,550	592,196	1,441,143	3,379,889
Utah	108	−8	----------	5	79	16	----------	95
West Virginia	30,526	761	253	4,799	26,741	----------	----------	26,741
Wyoming	50,348	7,420	----------	3,894	16,528	867	36,479	53,874
Alabama, Florida, Missouri, and North Dakota	20,013	7	18	1,001	18	----------	19,019	19,037
Total	5,438,565	715,764	94,056	346,053	2,809,846	1,008,205	2,084,281	5,902,332

[1] Comprises natural gasoline, LP-gases, and condensate.
[2] Includes offshore reserves.
[3] Not allocated by types, but occurring principally in column above.

PRODUCTION

The production of natural-gas liquids increased 4 percent compared with 12 percent in 1955. LP-gas production continued the highest rate of growth of the various natural-gas liquids; it increased 9 percent. Natural gasoline and natural-gasoline mixtures showed a slight decrease for the first time since 1942.

TABLE 3.—Natural-gas liquids produced and natural gas treated in the United States, 1956, by States

State	Number of operators[3]	Production: Natural gasoline[1]		LP-gases		Finished gasoline and naphtha		Other products[2]		Total		Natural gas treated		
													Average yield (gallons per M cubic feet)	
		Thousand gallons	Thousand dollars	Thousand gallons	Thousand dollars	Thousand gallons	Thousand dollars	Thousand gallons	Thousand dollars	Thousand gallons	Thousand dollars	Million cubic feet	Natural-gas liquids, except LP-gases	All natural-gas liquids
Arkansas	9	38,264	2,201	56,146	2,293	2,669	297	596	43	97,675	4,834	48,233	0.86	2.02
California	26	822,073	79,905	410,232	21,332			54,829	4,710	1,287,134	105,947	572,749	1.53	2.25
Colorado[4]	9	47,001	2,872	59,313	3,271			118	8	106,432	6,151	49,052	.96	2.17
Illinois[5]	8	30,787	2,328	342,328	13,750	1,967	256			375,082	16,334	175,618	.19	2.14
Kansas	12	105,224	5,910	90,287	3,843			258	18	195,769	9,771	407,749	.26	.48
Kentucky	5	35,058	2,378	248,992	8,709			217	36	284,267	11,123	[6] 406,260	.09	.70
Louisiana	31	206,673	13,052	305,222	14,727	350,375	32,929	216,901	16,413	1,079,171	77,121	839,274	.92	1.29
Mississippi	3	15,444	1,079	10,698	580			9,385	672	35,527	2,331	144,227	.17	.25
Nebraska[7]	3	19,426	1,365	53,875	2,976					73,301	4,341	21,211	.92	3.46
New Mexico	10	292,314	16,099	308,218	11,065			14,281	461	614,813	27,625	578,468	.53	1.06
Oklahoma	38	486,523	26,185	579,101	23,427	3,078	334	362	24	1,069,064	49,970	620,901	.79	1.72
Pennsylvania	7	4,081	251	1,127	99					5,208	350	13,949	.29	.37
Texas	111	2,257,372	157,689	3,731,047	144,745	474,192	41,203	233,045	17,486	6,695,656	361,123	4,463,158	.66	1.50
West Virginia	10	35,094	2,511	240,989	12,031	634	83			276,717	14,625	181,772	.20	1.52
Wyoming	8	43,556	2,821	49,838	2,337			5,303	339	98,697	5,497	67,542	.72	1.46
Total	200	4,438,890	316,646	6,487,413	265,185	832,915	75,102	535,295	40,210	12,294,513	697,143	8,590,163	.68	1.43

[1] Includes isopentane.
[2] Includes condensate, kerosine, distillate fuel, etc.
[3] A producer operating in more than 1 State is counted but once in arriving at total for United States.
[4] Montana (with 2 operators) and Utah (with 1 operator) included in Colorado.
[5] Michigan and Ohio (with 2 operators each) included in Illinois.
[6] Includes gas from transmission lines, previously treated in another State.
[7] North Dakota (with 1 operator) included in Nebraska.

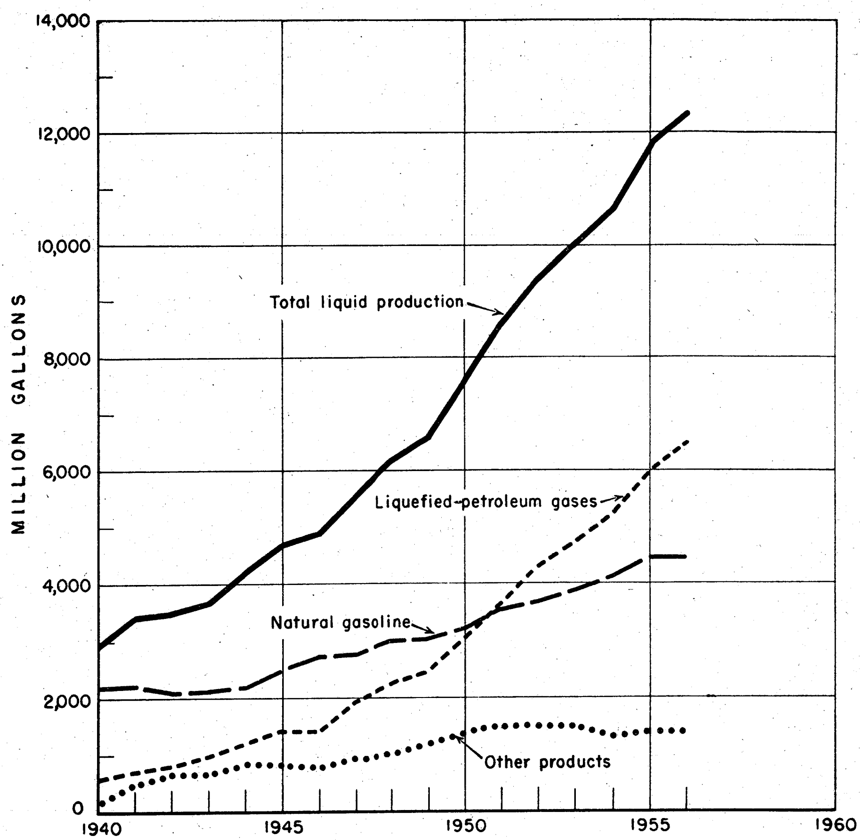

FIGURE 1.—Production of the natural-gas-liquids industry in the United States, 1940–56.

TABLE 4.—Monthly production of natural-gas liquids in the United States, 1956, by States and districts,[1] in thousand gallons

State and district	January	February	March	April	May	June	July
West Pennsylvania	469	472	536	457	398	344	382
West Virginia	23, 138	19, 536	28, 721	21, 942	23, 739	24, 536	19, 283
Illinois, Michigan, and Ohio	31, 060	30, 793	30, 990	27, 950	29, 818	29, 249	31, 509
Kentucky	25, 529	23, 807	25, 424	23, 940	23, 509	22, 585	22, 913
Kansas	22, 264	20, 741	19, 497	16, 678	12, 291	11, 557	10, 993
Nebraska and North Dakota	7, 167	6, 597	6, 036	4, 956	5, 099	4, 623	5, 145
Oklahoma	98, 882	89, 079	94, 377	88, 822	85, 333	80, 467	84, 964
Texas:							
Gulf	119, 891	108, 506	120, 890	117, 110	122, 001	117, 794	108, 784
East Texas	28, 927	27, 223	30, 562	29, 171	30, 258	29, 465	32, 293
Panhandle	93, 624	89, 182	87, 674	81, 682	78, 146	74, 292	77, 009
West Texas	172, 757	164, 729	178, 001	163, 738	175, 508	181, 502	190, 705
Rest of State	155, 640	147, 956	151, 120	146, 311	143, 824	133, 227	126, 836
Total Texas	570, 839	537, 596	568, 247	538, 012	549, 737	536, 280	535, 627
Arkansas	8, 626	8, 220	8, 678	8, 214	7, 227	8, 160	8, 489
Louisiana:							
Gulf	48, 099	46, 451	48, 485	45, 046	50, 689	47, 169	46, 156
Inland	48, 099	44, 822	46, 217	42, 103	42, 675	39, 058	40, 841
Total Louisiana	96, 198	91, 273	94, 702	87, 149	93, 364	86, 227	86, 997
Mississippi	1, 834	3, 064	3, 162	3, 059	3, 100	3, 032	3, 047
New Mexico	47, 748	44, 665	49, 636	47, 969	51, 764	50, 316	53, 141
Colorado, Montana, and Utah	8, 458	7, 999	10, 711	7, 573	8, 501	8, 139	8, 623
Wyoming	8, 413	8, 146	8, 348	7, 134	7, 401	7, 921	8, 051
California	112, 811	107, 782	112, 069	103, 562	106, 214	100, 865	105, 990
Total United States	1, 063, 436	999, 770	1, 061, 134	987, 417	1, 007, 495	974, 301	985, 154
Daily average	34, 304	34, 475	34, 230	32, 914	32, 500	32, 477	31, 779

State and district	August	September	October	November	December	Total
West Pennsylvania	238	390	483	498	541	5, 208
West Virginia	22, 278	21, 841	24, 364	22, 873	24, 466	276, 717
Illinois, Michigan, and Ohio	32, 940	32, 292	27, 758	34, 105	36, 618	375, 082
Kentucky	22, 192	22, 596	23, 697	23, 173	24, 902	284, 267
Kansas	12, 167	13, 972	13, 833	19, 602	22, 174	195, 769
Nebraska and North Dakota	6, 374	6, 467	6, 160	7, 188	7, 489	73, 301
Oklahoma	88, 434	88, 333	87, 780	90, 223	92, 370	1, 069, 064
Texas:						
Gulf	118, 462	121, 861	126, 020	127, 516	133, 834	1, 442, 669
East Texas	32, 239	30, 065	28, 680	27, 227	29, 586	355, 696
Panhandle	72, 275	77, 755	82, 734	86, 303	93, 509	994, 185
West Texas	205, 815	196, 980	192, 301	171, 635	197, 703	2, 191, 374
Rest of State	137, 610	137, 291	143, 076	139, 175	149, 666	1, 711, 732
Total Texas	566, 401	563, 952	572, 811	551, 856	604, 298	6, 695, 656
Arkansas	8, 159	7, 945	7, 870	8, 010	8, 077	97, 675
Louisiana:						
Gulf	48, 833	46, 413	48, 944	50, 995	51, 766	579, 046
Inland	40, 173	35, 684	39, 500	40, 113	40, 840	500, 125
Total Louisiana	89, 006	82, 097	88, 444	91, 108	92, 606	1, 079, 171
Mississippi	3, 123	3, 026	3, 050	2, 923	3, 107	35, 527
New Mexico	52, 871	52, 431	53, 604	54, 988	55, 680	614, 813
Colorado, Montana, and Utah	9, 162	9, 295	9, 261	8, 917	9, 793	106, 432
Wyoming	8, 463	8, 597	8, 041	8, 878	9, 304	98, 697
California	106, 730	101, 751	108, 126	109, 180	112, 054	1, 287, 134
Total United States	1, 028, 538	1, 014, 985	1, 035, 282	1, 033, 522	1, 103, 479	12, 294, 513
Daily average	33, 179	33, 833	33, 396	34, 451	35, 596	33, 592

[1] West Pennsylvania separated from eastern part of State to allow grouping either in a Bureau of Mines refinery district or Petroleum Administration for War district. Districts shown for Texas and Louisiana are Bureau of Mines production districts.

YIELDS, PROCESSES, AND NUMBER OF PLANTS

The overall yield of natural-gas liquids recovered decreased from 1.44 gallons per thousand cubic feet in 1955 to 1.43 gallons in 1956. The principal factor in this decrease was a drop in yield from 1.54 gallons in 1955 to 1.50 in 1956 for Texas, which processed 52 percent of the natural gas.

The number of plants operating at the end of 1956 totaled 568. Plants operating in 1956 were 3 less than in 1955; however, the quantity of liquids produced in 1956 increased at all types of plants.

In 1956 data were collected for the first time on the percentage of propane and butane recoverable with existing facilities from natural gas processed at natural-gasoline and cycling plants. Table 5 shows for each State a weighted average-percentage recovery based on the capacity reported for each plant in Information Circular 7790, Natural-Gasoline and Cycling Plants in the United States, January 1, 1956. This weighted average includes those plants with LP-gas-recovery facilities.

TABLE 5.—Propane and butane recovery efficiency of natural-gasoline and cycling plants having LP-gas facilities, 1956

State	Percent propane, recoverable from gas processed	Percent butane, recoverable from gas processed	State	Percent propane, recoverable from gas processed	Percent butane, recoverable from gas processed
Arkansas	53	81	New Mexico	32	69
California	57	82	Oklahoma	53	80
Colorado [1]	72	93	Pennsylvania	30	50
Illinois	94	96	Texas	53	70
Kansas	24	74	West Virginia	66	80
Kentucky	83	80	Wyoming	49	78
Louisiana	51	88			
Mississippi	63	96	Total	53	75
Nebraska [2]	74	94			

[1] Montana combined with Colorado to avoid disclosing individual company data.
[2] North Dakota combined with Nebraska.

TABLE 6.—Natural-gas liquids produced in the United States in 1956, by States and by methods of manufacture

State	Number of plants operating				Production (thousand gallons)			
	Compression [1]	Absorption [2]	Cycling [3]	Total	Compression	Absorption	Cycling	Total
Arkansas	1	7	1	9	(4)	(4)	(4)	97,675
California	4	73	2	79	1,353	1,139,105	146,676	1,287,134
Colorado [5]	4	7	----------	11	48,291	[6] 58,141	----------	106,432
Illinois [7]	2	6	----------	8	3,353	371,729	----------	375,082
Kansas	2	13	----------	15	6,234	189,535	----------	195,769
Kentucky	3	3	----------	6	208,656	75,611	----------	284,267
Louisiana	3	36	12	51	88,128	311,611	679,432	1,079,171
Mississippi	----------	2	1	3	----------	(4)	(4)	35,527
Nebraska [8]	1	3	----------	4	(4)	(4)	----------	73,301
New Mexico	2	19	----------	21	23,435	591,378	----------	614,813
Oklahoma	10	60	2	72	33,890	889,280	145,894	1,069,064
Pennsylvania	5	6	----------	11	315	[6] 4,893	----------	5,208
Texas	27	172	30	229	232,449	[6] 5,323,369	1,139,838	6,695,656
West Virginia	30	9	----------	39	191,750	[6] 84,967	----------	276,717
Wyoming	1	9	----------	10	(4)	(4)	----------	98,697
Total: 1956	95	425	48	568	851,152	9,283,566	2,159,795	12,294,513
1955	92	429	50	571	735,231	8,941,135	2,141,236	11,817,602

[1] Includes 39 plants manufacturing LP-gases; 1 refrigeration-type plant each in California, Kansas, and Nebraska; 2 refrigeration-type plants each in New Mexico and Wyoming; 3 refrigeration-type plants in Colorado; and 10 refrigeration-type plants in Texas.
[2] Includes combination of absorption with compression process. Includes 324 plants manufacturing LP-gases.
[3] Includes 41 plants manufacturing LP-gases.
[4] Included in State total production and United States total production to avoid disclosing individual company operations.
[5] Montana (with 2 absorption plants) and Utah (with production of a small amount of drip gasoline) included in Colorado.
[6] Includes some drip gasoline.
[7] Michigan (with 2 compression plants) and Ohio (with 1 absorption plant) included in Illinois.
[8] North Dakota (with 1 absorption plant) included in Nebraska.

SHIPMENTS OF NATURAL-GAS LIQUIDS FROM PLANTS AND TERMINALS

Shipments of natural-gas liquids from plants and terminals increased 1 percent compared with a 13-percent increase in 1955.

For Motor-Fuel Use.—Total natural-gas liquids shipped for blending into motor fuel decreased slightly for the first time. The proportion of natural-gas liquids in refinery gasoline increased from 9.5 percent in 1955 to 10.0 percent in 1956. Texas Inland continued to increase from 33.8 percent in 1955 to 34.5 percent.

For Non-Motor-Fuel Uses.—Shipments of LP-gases[1] from plants and terminals for fuel and chemical uses continued its upward trend, showing a 5-percent increase in 1956.

[1] For a discussion of sales of LP-gases for fuel and chemical uses see page 311.

TABLE 7.—Supply and distribution at plants and terminals[1] of natural-gas liquids in the United States, 1956, by months, in thousand gallons

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Production:													
Natural gasoline and natural-gasoline mixtures	351,953	331,176	360,316	354,509	376,124	370,425	382,857	390,675	371,742	371,694	339,732	351,968	4,353,171
LP-gases:													
Propane	283,125	272,137	276,867	234,839	234,023	216,901	229,624	241,368	245,868	253,599	270,581	302,577	3,061,509
Butane, normal	125,650	114,213	119,553	109,933	113,310	114,274	125,586	115,920	127,456	120,138	124,479	135,003	1,445,515
Isobutane	35,177	32,770	35,112	34,458	35,123	33,236	33,670	35,188	33,393	35,767	34,409	36,825	415,128
Butane-propane mixture	67,041	63,779	67,788	71,493	59,488	54,596	44,880	67,901	55,330	61,436	68,171	70,653	752,556
Other LP-gas mixtures	68,409	62,006	73,114	62,925	69,790	69,530	55,204	62,549	69,383	69,402	74,382	76,011	812,705
Isopentane	6,156	5,362	7,364	7,145	8,053	7,733	8,339	8,347	7,469	6,410	6,382	6,959	85,719
Finished gasoline and naphtha	74,658	65,112	71,627	65,349	64,372	61,788	61,990	58,173	79,066	75,305	75,193	80,282	832,915
Condensate, raw	32,350	35,921	29,245	27,420	31,597	30,437	28,595	31,258	8,436	23,646	25,747	24,856	329,058
Other products	18,917	17,294	20,148	19,346	15,615	15,381	14,409	17,159	16,842	17,885	14,446	18,345	205,787
Total	1,063,436	999,770	1,061,134	987,417	1,007,495	974,301	985,154	1,028,538	1,014,985	1,035,282	1,033,522	1,103,479	12,294,513
Stock change at plants and terminals	−85,538	−10,152	53,332	58,860	89,691	106,175	82,812	21,415	98,264	33,657	−52,876	−96,027	299,613
Shipments:													
For use in gasoline:													
Natural gasoline and natural-gasoline mixtures	337,502	325,260	347,131	345,037	370,813	363,851	373,046	397,582	365,172	374,384	345,817	361,779	4,307,374
LP-gases:													
Propane	7,980	4,662	2,856	2,352	2,352	4,536	11,088	7,854	6,930	6,426	2,058	4,200	63,294
Butane, normal	71,204	52,978	44,729	41,087	34,986	37,201	43,838	47,037	39,131	86,946	121,869	109,861	730,867
Isobutane	35,875	30,474	31,608	35,369	37,657	34,114	31,566	35,100	33,538	35,929	33,429	37,989	412,648
Butane-propane mixture	2,310	4,242	6,804	13,902	15,624	20,664	20,202	20,664	588	1,848	252	798	107,898
Other LP-gas mixtures	8,568	7,560	9,912	7,602	5,670	4,662	2,646	4,536	6,384	6,678	11,004	21,462	96,684
Isopentane	6,184	5,928	7,557	6,559	8,191	9,061	8,728	8,342	7,729	6,252	6,036	6,661	87,228
Finished gasoline and naphtha	69,363	69,378	75,756	68,779	68,810	61,895	63,560	64,742	81,721	73,386	76,571	77,370	851,331
Condensate	30,950	32,840	27,575	27,383	33,505	30,441	30,581	39,505	8,828	22,202	24,391	24,864	333,065
For other uses:													
LP-gases:[2]													
Propane	359,653	292,951	249,757	192,858	158,466	130,703	147,207	182,558	195,755	202,134	290,222	377,893	2,780,157
Butane, normal	63,829	51,408	64,330	59,816	62,976	62,123	64,521	77,050	40,904	48,028	31,296	34,910	661,191
Isobutane	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Butane-propane mixture	72,568	60,607	55,532	52,452	39,653	29,500	38,364	48,100	50,696	55,917	68,637	69,814	641,840
Other LP-gas mixtures	59,911	52,602	64,601	55,521	63,949	65,105	52,581	57,901	62,991	62,394	62,491	53,508	713,555
Other products	23,077	19,032	19,654	19,840	15,152	14,270	14,414	16,152	16,354	19,101	12,325	18,397	207,768
Total demand at plants and terminals	1,148,974	1,009,922	1,007,802	928,557	917,804	868,126	902,342	1,007,123	916,721	1,001,625	1,086,398	1,199,506	11,994,900

[1] Terminals owned by producers.
[2] Includes LP-gas exports.

TABLE 8.—Natural-gas liquids utilized at refineries in the United States, 1956, by Bureau of Mines refinery districts and by months, in thousand gallons

District	January	February	March	April	May	June	July
East Coast	12,726	8,778	9,660	5,628	8,610	6,426	6,972
Appalachian	1,974	1,512	714	42	---	---	---
Indiana, Illinois, Kentucky, etc.	53,592	49,896	49,854	46,326	44,604	42,588	44,184
Minnesota, Wisconsin, North Dakota, and South Dakota	1,050	840	546	714	546	1,050	756
Oklahoma, Kansas, Missouri	57,246	50,442	46,704	44,268	41,958	48,090	48,972
Texas:							
Gulf Coast	123,018	102,144	109,872	113,022	119,448	116,130	129,234
Inland	74,256	66,150	88,830	88,788	88,200	86,856	87,906
Total Texas	197,274	168,294	198,702	201,810	207,648	202,986	217,140
Louisiana-Arkansas:							
Louisiana Gulf Coast	28,350	21,924	25,956	26,334	25,872	24,570	27,762
Arkansas, Louisiana Inland	2,100	2,478	1,386	588	1,008	2,100	2,184
Total Louisiana-Arkansas	30,450	24,402	27,342	26,922	26,880	26,670	29,946
Rocky Mountain	11,130	9,114	5,628	9,156	8,148	6,972	6,594
California	91,644	86,016	90,930	88,998	95,172	96,684	101,682
Total United States	457,086	399,294	430,080	423,864	433,566	431,466	456,246

District	August	September	October	November	December	Total
East Coast	7,728	7,434	7,728	8,316	9,492	99,498
Appalachian	42	---	---	42	84	4,410
Indiana, Illinois, Kentucky, etc.	47,796	61,950	64,428	65,856	71,274	642,348
Minnesota, Wisconsin, North Dakota, and South Dakota	1,008	630	714	882	882	9,618
Oklahoma, Kansas, Missouri	47,628	47,166	57,540	46,368	51,954	588,336
Texas:						
Gulf Coast	138,096	126,882	141,918	148,848	160,650	1,529,262
Inland	91,686	94,290	97,776	83,958	83,328	1,032,024
Total Texas	229,782	221,172	239,694	232,806	243,978	2,561,286
Louisiana-Arkansas:						
Louisiana Gulf Coast	25,032	35,490	81,270	90,174	95,760	508,494
Arkansas, Louisiana Inland	2,226	2,226	2,730	3,150	3,108	25,284
Total Louisiana-Arkansas	27,258	37,716	84,000	93,324	98,868	533,778
Rocky Mountain	6,972	9,240	11,466	11,382	13,272	109,074
California	98,742	93,450	99,540	93,114	88,284	1,124,256
Total United States	466,956	478,758	565,110	552,090	578,088	5,672,604

TABLE 9.—Percentage of natural-gas liquids in refinery gasoline in the United States, 1952–56, by Bureau of Mines refinery districts

Year	East Coast	Appalachian	Indiana, Illinois, Kentucky, etc.	Minnesota, Wisconsin, North Dakota, and South Dakota	Oklahoma, Kansas, Missouri	Texas Inland	Texas Gulf Coast	Louisiana Gulf Coast	Arkansas, Louisiana Inland	Rocky Mountain	California	Total
1952	2.2	0.7	5.2	(1)	8.4	24.3	11.1	5.3	12.2	4.7	16.8	9.0
1953 [2]	2.3	.3	5.2	(1)	8.6	25.7	10.7	5.5	9.4	5.6	16.9	9.0
1954 [2]	2.8	.7	5.2	(1)	9.4	[3] 31.1	10.2	6.5	7.0	5.8	18.2	9.5
1955 [2]	1.9	.8	5.8	(1)	9.7	33.8	10.2	5.9	5.4	5.5	16.6	9.5
1956 [2]	1.4	.3	5.8	1.5	10.1	34.5	10.9	9.4	4.7	5.1	15.1	10.0

[1] Minnesota, Wisconsin, North Dakota, and South Dakota district not shown separately before 1956.
[2] Refinery gasoline excludes jet fuel.
[3] Revised.

SALES OF LIQUEFIED-PETROLEUM GASES[2]

Sales of liquefied-petroleum gases were 8 percent higher in 1956 compared with a 20-percent increase in 1955, according to a survey made by the Bureau of Mines, United States Department of the Interior. Exports of LP-gases, as released by the Bureau of the Census, United States Department of Commerce, increased only 1 percent in 1956, compared with 8 percent in 1955 and 32 percent in 1954.

Liquefied-petroleum gases sold for domestic and commercial use showed a moderate gain of 7 percent in both 1955 and 1956. The 1955 sales of LP-gases to chemical plants were revised for more complete coverage of all gases delivered to these plants for raw material and solvents and for data comparable with those for 1956. Sales to chemical plants increased 5 percent over the 1955 revised total.

Deliveries of LP-gases for synthetic-rubber components increased only 3 percent in 1956. This compares with an increase of 32 percent in 1955, when ownership and operation of these synthetic rubber plants were being transferred from Government to private industry. A large increase of 19 percent in the sales of LP-gases for internal-combustion-engine fuel in 1955 was repeated in 1956.

LP-gases used for fuel at petroleum refineries were separated from the total reported sold to industrial plants in 1955, to make data

TABLE 10.—Sales of LP-gases [1] in the United States, 1952–56, in thousand gallons

Year	Butane	Percent of total	Propane	Percent of total	Butane-propane mixture	Percent of total	All other mixtures	Percent of total	Total LP-gas	Total, percent	Increase over previous year, percent
1952	639,282	14.3	2,513,595	56.1	1,324,502	29.6	(2)	------	4,477,379	100.0	5.9
1953	671,320	13.6	2,832,495	57.4	1,428,194	29.0	(2)	------	4,932,009	100.0	10.2
1954	765,826	14.9	2,968,312	57.9	1,391,395	27.2	(2)	------	5,125,533	100.0	3.9
1955 [3]	724,334	11.8	3,260,571	53.3	1,428,938	23.3	708,875	11.6	6,122,718	100.0	19.5
1956	888,545	13.4	3,626,189	54.6	1,160,017	17.5	[4] 961,012	14.5	6,635,763	100.0	8.4

[1] Data include LR-gases.
[2] Not reported separately before 1955.
[3] Revised.
[4] Includes 36,088,000 gallons of isobutane.

TABLE 11.—Sales of LP-gases [1] in the United States, 1952–56, by uses, in thousand gallons

Year	Domestic and commercial	Chemical	Synthetic rubber	Internal combustion	Industrial	Refinery fuel	Gas manufacture	All other	Total
1952	2,266,178	870,990	370,997	370,558	324,967	(2)	259,697	13,992	4,477,379
1953	2,479,180	967,427	390,501	498,238	348,517	(2)	222,430	25,716	4,932,009
1954	2,626,808	1,050,239	307,735	547,204	375,121	(2)	191,932	26,494	5,125,533
1955 [3]	2,801,379	1,493,177	406,210	651,821	423,431	101,033	213,760	31,907	6,122,718
1956	3,001,021	1,571,147	418,101	773,471	468,373	142,590	212,293	48,767	6,635,763

[1] Data include LR-gases.
[2] Not reported separately before 1955.
[3] Revised.

[2] LP-gases, as used in this section, include LR-(liquid-refinery) gases.
The survey covering sales of LP-gases in the Pacific coast marketing area (district 5) was made by E. T. Knudsen, supervising analyst, Branch of Petroleum Economics, Region II, Bureau of Mines, San Francisco, California.

TABLE 12.—Sales of LP-gases [1] in the United States, 1955–56, by districts and States, in thousand gallons

Districts [2] and States	Domestic and commercial		Gas manufacturing		Industrial		Synthetic rubber	
	1955	1956	1955	1956	1955	1956	1955	1956
District 1:								
Connecticut	21,891	23,845	843	479	13,409	13,112	------	------
Delaware	6,634	7,687	1,120	807	3,206	4,685	------	------
Florida	102,648	112,922	18,824	21,728	7,117	6,197	------	------
Georgia	71,887	73,411	11,827	9,928	4,903	6,079	------	------
Maine	14,290	16,295	1,399	1,204	1,175	1,251	------	------
Maryland and District of Columbia	23,443	28,567	6,531	5,821	[3] 2,448	[3] 2,950	------	------
Massachusetts	27,669	31,251	3,658	3,041	2,960	3,385	------	------
New Hampshire	11,276	12,047	2,106	2,049	1,088	1,189	------	------
New Jersey	29,185	33,996	4,716	5,053	[3] 20,293	[3] 22,124	------	------
New York	72,192	77,184	6,400	6,620	[3] 8,953	[3] 10,173	------	------
North Carolina	60,764	63,349	13,751	13,573	3,530	3,357	------	------
Pennsylvania	45,554	48,126	13,516	9,828	[3] 37,281	[3] 40,880	------	------
Rhode Island	5,363	5,576	139	154	601	610	------	------
South Carolina	41,186	42,370	3,853	3,901	5,834	6,096	------	------
Vermont	9,249	10,763	2,354	2,503	1,072	952	------	------
Virginia	33,651	37,523	1,663	1,385	3,246	3,557	------	------
West Virginia	6,578	6,047	340	107	2,346	[3] 4,575	------	------
Total	583,460	630,959	93,040	88,181	[4] 144,224	[4] 164,000	------	------
District 2:								
Illinois	127,973	147,684	9,163	10,836	[3] 27,635	33,900	------	------
Indiana	78,680	84,758	10,707	8,722	17,959	[3] 24,556	------	------
Iowa	76,753	84,962	7,507	6,322	10,746	9,501	------	------
Kansas	117,141	133,860	------	15	[3] 1,445	[3] 3,441	------	------
Kentucky	43,337	47,887	------	------	[3] 1,762	[3] 1,103	------	------
Michigan	52,763	59,714	6,556	4,011	[3] 22,962	[3] 20,737	------	------
Minnesota	80,269	88,627	7,246	7,516	8,116	[3] 11,724	------	------
Missouri	111,198	129,736	4,687	6,459	7,009	7,433	------	------
Nebraska	62,573	65,845	1,782	1,884	3,855	4,186	------	------
North Dakota	31,152	32,305	2,343	2,794	1,847	1,564	------	------
Ohio	41,916	44,320	3,607	3,849	[3] 9,701	[3] 12,387	------	------
Oklahoma	143,828	150,616	900	------	[3] 7,672	[3] 15,003	------	------
South Dakota	39,377	41,630	8,470	11,477	2,613	2,140	------	------
Tennessee	31,496	32,897	1,804	1,790	2,423	2,361	------	------
Wisconsin	57,304	59,029	9,583	10,976	38,019	39,764	------	------
Total	1,095,760	1,203,870	74,355	76,651	[4] 204,098	[4] 252,948	------	------
District 3:								
Alabama	62,276	70,010	1,661	1,641	5,676	[3] 5,829	------	------
Arkansas	97,782	102,314	------	1,465	3,987	3,345	------	------
Louisiana	73,613	76,097	110	------	10,895	[3] 16,514	26,910	36,351
Mississippi	83,119	87,904	250	------	790	2,033	------	------
New Mexico	39,246	46,722	3,081	3,379	4,788	10,935	------	------
Texas	385,567	394,791	5,555	3,832	[3] 84,984	[3] 78,286	347,579	340,764
Total	741,603	777,838	10,657	10,317	[4] 131,166	[4] 153,292	374,489	377,115
District 4:								
Colorado	66,856	69,403	1,022	1,185	5,319	5,457	------	------
Idaho	11,875	12,036	1,400	1,350	1,426	1,533	------	------
Montana	18,634	21,382	350	------	1,290	1,452	------	------
Utah	9,922	11,526	2,280	2,099	[3] 1,037	[3] 915	------	------
Wyoming	24,723	26,569	------	583	1,121	1,077	------	------
Total	132,010	140,916	5,052	5,217	[4] 10,801	[4] 10,482	------	------
District 5:								
Arizona	19,224	18,401	------	------	1,190	1,419	------	------
California	164,881	161,802	6,554	7,915	[3] 10,624	[3] 13,385	31,721	40,986
Nevada	11,569	11,992	6,587	6,495	446	228	------	------
Oregon	35,999	36,711	9,591	10,388	3,617	2,634	------	------
Washington	16,873	18,532	7,924	7,129	[3] 3,015	2,359	------	------
Total	248,546	247,438	30,656	31,927	[4] 34,175	[4] 30,241	31,721	40,986
Total United States	2,801,379	3,001,021	213,760	212,293	524,464	610,963	406,210	418,101

[1] Data include LR-gases.
[2] States are grouped according to petroleum-marketing districts rather than geographic regions.
[3] Revised; refinery fuel consumption deleted in State totals to be comparable with 1956 data.
[4] Consumption of refinery fuel shown in district totals only in order to avoid disclosure

TABLE 12.—Sales of LP-gases[1] in the United States, 1955–56, by districts, States and uses, in thousand gallons—Continued

Districts[2] and States	Chemical		Internal combustion		All other		Total	
	1955	1956	1955	1956	1955	1956	1955	1956
District 1:								
Connecticut	11	----------	625	609	2,474	2,558	39,253	40,603
Delaware	243	54	130	82	200	205	11,533	13,520
Florida	191	----------	2,390	8,656	660	1,218	131,830	150,721
Georgia	123	92	2,238	4,404	1,537	1,929	92,515	95,843
Maine	----------	----------	44	81	1,015	915	17,923	19,746
Maryland and D. C.	----------	----------	95	579	150	140	[3] 32,667	[4] 38,057
Massachusetts	----------	----------	170	244	463	751	34,920	38,672
New Hampshire	----------	----------	----------	----------	34	25	14,504	15,310
New Jersey	28,308	29,741	125	471	400	350	[3] 83,027	[4] 91,735
New York	3,137	3,126	783	1,788	65	150	[3] 91,530	[4] 99,041
North Carolina	561	51	1,332	1,183	2,380	2,368	82,318	83,881
Pennsylvania	10,795	12,105	972	880	99	91	[3] 108,217	[4] 111,910
Rhode Island	----------	----------	----------	----------	----------	21	6,103	6,361
South Carolina	616	419	240	1,404	646	632	52,375	54,822
Vermont	----------	----------	----------	----------	72	75	12,747	14,293
Virginia	114	92	213	471	202	325	39,089	43,353
West Virginia	273,899	278,615	640	559	55	50	283,858	[4] 289,953
Total	317,998	324,295	9,997	21,411	10,452	11,803	[4] 1,159,171	[4] 1,240,649
District 2:								
Illinois	96,666	117,494	40,576	44,626	357	880	[3] 302,370	355,420
Indiana	[5] 9,537	1,880	8,007	12,045	897	1,741	[5] 125,787	[4] 133,702
Iowa	----------	----------	3,121	3,884	465	1,061	98,592	105,730
Kansas	----------	826	25,239	34,022	523	1,591	[3] 144,348	[4] 173,755
Kentucky	121,498	119,482	3,602	4,330	40	90	[3] 170,239	[4] 172,892
Michigan	2,250	10,640	4,347	4,043	256	2,013	[3] 89,134	[4] 101,158
Minnesota	----------	----------	6,039	8,263	873	1,927	102,543	[4] 118,057
Missouri	5	----------	7,403	8,780	587	626	130,889	153,034
Nebraska	----------	----------	6,627	10,116	213	1,028	75,050	83,059
North Dakota	----------	----------	7,446	7,599	230	538	43,018	44,800
Ohio	155	----------	2,773	3,029	448	431	[3] 58,600	[4] 64,016
Oklahoma	3,463	3,489	30,465	41,186	896	1,530	[3] 187,224	[4] 211,824
South Dakota	10	40	2,350	2,993	258	465	53,078	58,745
Tennessee	1,673	1,246	1,983	3,291	225	253	39,604	41,838
Wisconsin	----------	----------	4,865	4,998	442	620	110,213	[4] 115,387
Total	[5] 235,257	255,097	154,843	193,205	6,710	14,794	[4,5] 1,771,023	[4] 1,996,565
District 3:								
Alabama	----------	----------	2,789	6,230	108	128	72,510	[4] 83,838
Arkansas	21	----------	20,222	30,449	1,720	1,663	123,732	139,236
Louisiana	188,083	184,074	26,508	26,861	74	201	326,193	[4] 340,098
Mississippi	----------	----------	17,499	19,939	1,487	1,884	103,145	111,760
New Mexico	1,152	----------	29,154	35,414	1,242	974	78,663	97,424
Texas	683,026	721,370	302,019	343,566	6,010	9,188	[3] 1,814,740	[4] 1,891,797
Total	872,282	905,444	398,191	462,459	10,641	14,038	[4] 2,539,029	[4] 2,700,503
District 4:								
Colorado	169	124	7,298	11,320	292	438	80,956	87,927
Idaho	----------	----------	120	199	29	----------	14,850	15,118
Montana	----------	----------	2,265	2,738	----------	50	22,539	25,622
Utah	10	----------	1,485	1,720	124	169	[3] 14,858	[4] 16,429
Wyoming	----------	----------	5,883	6,735	43	36	31,770	35,000
Total	179	124	17,051	22,712	488	693	[4] 165,581	[4] 180,144
District 5:								
Arizona	----------	----------	9,692	10,215	----------	559	30,106	30,594
California	67,461	86,187	60,364	61,515	3,004	5,169	[3] 344,609	[4] 376,959
Nevada	----------	----------	220	141	19	----------	18,841	18,856
Oregon	----------	----------	1,123	1,383	306	1,574	50,636	52,690
Washington	----------	----------	340	430	287	137	[3] 28,439	28,587
Total	67,461	86,187	71,739	73,684	3,616	7,439	[4] 487,914	[4] 517,902
Total United States sales	[5] 1,493,177	1,571,147	651,821	773,471	31,907	48,767	[5] 6,122,718	6,635,763

[1] Data include LR-gases.
[2] States are grouped according to petroleum-marketing districts rather than geographic areas.
[3] Revised; refinery-fuel consumption deleted in State totals to be comparable with 1956 data.
[4] Consumption of refinery fuel shown in district totals only to avoid disclosure.
[5] Revised.

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TABLE 13.—Sales of LP-gases [1] in the United States, 1955–56, by districts and States, in thousand gallons

Districts [2] and States	Butane 1955	Butane 1956	Propane 1955	Propane 1956	B-P mixture 1955	B-P mixture 1956	All other mixtures 1955	All other mixtures 1956	Total LP-gases 1955	Total LP-gases 1956	Percent change
District 1:											
Connecticut	659	563	38,188	39,962	406	78	-----	-----	39,253	40,603	3.4
Delaware	-----	-----	11,533	13,520	-----	-----	-----	-----	11,533	13,520	17.2
Florida	1,824	4,488	89,557	120,838	40,449	25,395	-----	-----	131,830	150,721	14.3
Georgia	1,732	3,003	60,628	79,254	30,155	13,586	-----	-----	92,515	95,843	3.6
Maine	-----	-----	17,363	19,746	560	-----	-----	-----	17,923	19,746	10.2
Maryland and D. C	[3] 92	(4)	[3] 32,575	38,057	-----	-----	-----	-----	[3] 32,667	[4] 38,057	16.5
Massachusetts	234	223	34,686	38,399	-----	50	-----	-----	34,920	38,672	10.7
New Hampshire	496	699	14,008	14,539	-----	72	-----	-----	14,504	15,310	5.6
New Jersey	[3] 25,474	[4] 26,633	[3] 53,644	[4] 61,024	3,909	4,078	-----	-----	[3] 83,027	[4] 91,735	10.5
New York	[3] 162	[4] 313	[3] 88,099	[4] 96,460	3,269	2,268	-----	-----	[3] 91,530	[4] 99,041	8.2
North Carolina	315	193	78,377	81,183	3,626	2,505	-----	-----	82,318	83,881	1.9
Pennsylvania	6,196	[4] 3,428	[3] 99,371	[4] 107,162	2,650	1,320	-----	-----	[3] 108,217	[4] 111,910	3.4
Rhode Island	-----	-----	6,103	6,361	-----	-----	-----	-----	6,103	6,361	4.2
South Carolina	5,570	6,271	36,266	42,489	10,539	6,062	-----	-----	52,375	54,822	4.7
Vermont	-----	-----	12,661	14,196	86	97	-----	-----	12,747	14,293	12.1
Virginia	300	263	38,717	43,090	72	-----	-----	-----	39,089	43,353	10.9
West Virginia	13,799	17,185	12,672	[4] 7,672	17,647	9,577	239,740	255,519	283,858	[4] 289,953	2.1
Total	[4] 76,048	[4] 91,507	[4] 730,015	[4] 828,535	113,368	65,088	239,740	255,519	[4] 1,159,171	[4] 1,240,649	7.0
District 2:											
Illinois	12,169	18,630	[3] 188,774	215,595	6,528	5,072	94,899	116,123	[3] 302,370	355,420	17.5
Indiana	[3] 10,333	[4] 11,549	110,848	[4] 121,368	[5] 4,606	[4] 785	-----	-----	[5] 125,787	[4] 133,702	6.3
Iowa	1,493	1,601	96,571	103,634	528	495	-----	-----	98,592	105,730	7.2
Kansas	[3] 11,437	[4] 25,884	[3] 106,524	[4] 127,407	26,387	20,464	-----	-----	[3] 144,348	[4] 173,755	20.4
Kentucky	[3] 1,017	[4] 2,273	[3] 45,630	[4] 49,479	8,030	2,142	115,562	118,998	[3] 170,239	[4] 172,892	1.6
Michigan	[3] 5,436	[4] 3,644	[3] 80,285	[4] 95,259	3,413	34	-----	2,221	[3] 89,134	[4] 101,158	13.5
Minnesota	3,215	[4] 8,251	99,189	[4] 108,762	139	[4] 1,044	-----	-----	102,543	[4] 118,057	15.1
Missouri	4,479	5,764	117,312	141,225	9,098	6,045	-----	-----	130,889	153,034	16.9
Nebraska	4,737	5,203	66,611	73,865	3,702	3,991	-----	-----	75,050	83,059	10.7
North Dakota	1,148	1,078	39,819	42,213	2,051	1,509	-----	-----	43,018	44,800	4.1
Ohio	[3] 2,432	[4] 900	[3] 56,121	[4] 63,116	47	-----	-----	-----	[3] 58,600	[4] 64,016	9.2
Oklahoma	24,014	[4] 30,684	100,445	[4] 120,648	[3] 62,765	[4] 60,492	-----	[6] 6,254	[3] 187,224	[4] 218,078	16.5
South Dakota	1,521	1,329	51,073	57,069	484	347	-----	-----	53,078	58,745	10.7
Tennessee	1,136	388	34,449	38,017	4,019	3,433	-----	-----	39,604	41,838	5.6
Wisconsin	18,133	19,423	89,540	93,766	2,540	[4] 2,198	-----	-----	110,213	[4] 115,387	4.7
Total	[4] 130,822	[4] 176,662	[4] 1,291,527	[4] 1,464,235	[4 5] 138,213	[4] 112,072	210,461	243,596	[4 5] 1,771,023	[4] 1,996,565	12.7
District 3:											
Alabama	3,956	5,628	29,414	[4] 41,862	39,140	36,348	-----	-----	72,510	[4] 83,838	15.6
Arkansas	11,961	18,400	50,545	66,355	61,205	54,481	21	-----	123,732	139,236	12.5

Louisiana	28,369	41,018	74,461	[4] 37,553	96,865	[4] 77,487	126,498	184,040	326,193	[4] 340 098	4.3
Mississippi	5,143	9,355	40,308	49,024	57,694	53,381			103,145	111,760	8.4
New Mexico	9,541	15,001	42,979	55,053	26,143	27,370			78,663	97,424	23.8
Texas	[3] 375,756	[4] 425,131	[3] 520,830	[4] 574,507	806,761	[4] 635,909	111,393	256,250	[3] 1,814,740	[4] 1,891,797	4.2
Total	[4] 445,790	[4] 538,408	[4] 767,519	[4] 830,647	1,087,808	[4] 891,158	237,912	[7] 440,290	[4] 2,539,029	[4] 2,700,503	6.4
District 4:											
Colorado	2,941	6,784	70,750	74,195	7,265	6,948			80,956	87,927	8.6
Idaho	382	423	14,468	14,695					14,850	15,118	1.8
Montana	464	1,164	22,045	24,458	30				22,539	25,622	13.7
Utah	[3] 372	[4] 364	14,452	[4] 16,065	34				[3] 14,858	[4] 16,429	10.6
Wyoming	3,480	4,595	25,273	28,336	3,017	2,069			31,770	35,000	10.2
Total	[4] 8,247	[4] 13,349	146,988	[4] 157,778	10,346	9,017			[4] 165,581	[4] 180,144	8.8
District 5:											
Arizona			25,468	27,567	4,638	3,027			30,106	30,594	1.6
California	[3] 50,461	[4] 67,708	[3] 202,267	[4] 211,162	71,119	[4] 76,482	20,762	21,607	[3] 344,609	[4] 376,959	9.4
Nevada			18,661	18,856	180				18,841	18,856	0.1
Oregon			49,035	50,826	1,601	1,864			50,636	52,690	4.1
Washington	(3)		26,774	27,279	1,665	1,308			[3] 28,439	28,587	0.5
Total	[4] 63,427	[4] 68,619	[4] 324,522	[4] 344,994	79,203	[4] 82,682	20,762	21,607	[4] 487,914	[4] 517,902	6.1
Total United States sales	724,334	888,545	3,260,571	3,626,189	[5] 1,428,938	1,160,017	708,875	[8] 961,012	[5] 6,122,718	6,635,763	8.4
Exports [9, 10]									177,708	179,506	1.0
Grand total									[5] 6,300,426	6,815,269	8.2

[1] Data include LR-gases.
[2] States are grouped according to petroleum-marketing districts rather than geographic areas.
[3] Revised; refinery fuel consumption deleted in State totals to be comparable with 1956 data.
[4] Consumption of refinery fuel shown in district totals only, to avoid possible disclosure of individual company items.
[5] Revised.
[6] Isobutane.
[7] Includes 29,834,000 gallons of isobutane.
[8] Includes 36,088,000 gallons of isobutane.
[9] Not available by the different gases.
[10] Converted from pounds to gallons at 4.5 pounds per gallon.

comparable with 1956 items. Sales of LP-gases to industrial plants in 1956 recorded a gain of 11 percent over the adjusted 1955 totals, whereas the quantity used as fuel at petroleum refineries increased 41 percent over 1955, reflecting better coverage for this use in the current survey. Sales of LP-gases to manufactured-gas companies, which gained 11 percent in 1955 after declining for several years, were 1 percent lower in 1956.

STOCKS

Stocks of natural-gas liquids at plants and terminals increased 294 million gallons in 1956. LP-gas supplied the largest part of this increase, as underground stocks increased 216 million gallons and the stocks above ground increased 63 million gallons. Of the 863 million gallons of natural-gas liquids in storage as of December 31, 1956, underground stocks of LP-gas totaled 420 million gallons.

TABLE 14.—Stocks of natural-gas liquids in the United States, 1952–55 and 1956, by months, in thousand gallons

Date	Natural gasoline		LP-gases		Other products		Total		
	At plants and terminals	At refineries	At plants and terminals	At refineries	At plants and terminals	At refineries	At plants and terminals	At refineries	Grand total
Dec. 31:									
1952	84,462	69,426	92,022	15,120	63,924	2,940	240,408	87,486	327,894
1953	126,924	60,312	157,164	13,986	75,978	3,612	360,066	77,910	437,976
1954	95,021	76,650	286,352	22,176	100,545	8,862	481,918	107,688	589,606
1955	92,047	73,752	281,649	18,480	96,299	7,476	469,995	99,708	569,703
1956									
Jan. 31	106,470	67,704	179,153	28,224	98,834	7,014	384,457	102,942	487,399
Feb. 29	111,820	65,184	166,574	27,258	95,911	11,718	374,305	104,160	478,465
Mar. 31	124,812	66,486	208,879	23,814	93,946	13,020	427,637	103,320	530,957
Apr. 30	134,870	72,702	261,568	33,894	90,059	9,870	486,497	116,466	602,963
May 31	140,043	77,490	351,969	39,270	84,176	9,156	576,188	125,916	702,104
June 30	145,289	76,440	451,898	51,282	85,176	12,516	682,363	140,238	822,601
July 31	154,711	73,626	528,849	57,120	81,615	11,088	765,175	141,834	907,009
Aug. 31	147,809	73,164	570,975	65,604	67,806	11,550	786,590	150,318	936,908
Sept. 30	154,119	67,956	665,488	30,660	65,247	9,954	884,854	108,570	993,424
Oct. 31	151,587	62,622	699,530	23,856	67,394	10,500	918,511	96,978	1,015,489
Nov. 30	145,848	60,900	650,294	26,544	69,493	10,164	865,635	97,608	963,243
Dec. 31	136,335	58,422	560,928	26,166	72,345	9,282	769,608	93,870	863,478

PRICES

The average posted prices of Grade 26–70 natural gasoline to blenders f. o. b. group 3 basis was 4.84 cents per gallon in 1956, 0.29 cent per gallon below 1955. The posted price of 5.5 cents at the beginning of the year dropped 1.0 cent in March and remained there for the remainder of the year. Producers sold all natural gasoline for an average of 7.1 cents per gallon, compared with 7.0 cents in 1955.

The average posted price of propane f. o. b. Houston, Tex., was 4.78 cents per gallon, compared with 3.19 cents per gallon in 1955. The average price in January (4.57 cents per gallon) increased to 5.13 cents in October and remained at that average through December. The average value received by producers for all LP-gases increased in 1956, averaging 4.09 cents per gallon compared with 3.27 cents per gallon in 1955.

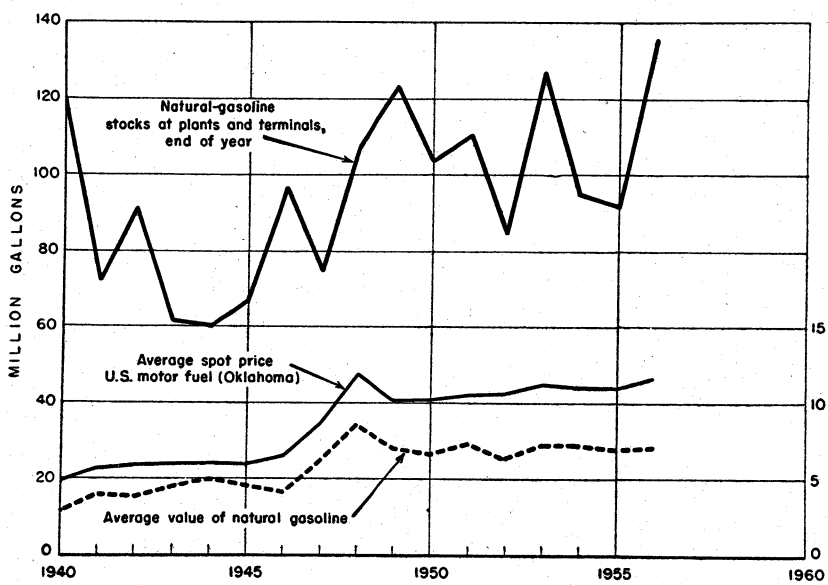

FIGURE 2.—Average value of natural gasoline, spot price of gasoline, and stocks of natural gasoline, 1940–56.

FOREIGN TRADE[3]

Exports of LP-gases increased 1 percent in 1956, compared with an 8-percent increase in 1955. Mexico and Canada continued to be the principal importers of LP-gases; however, shipments to Mexico decreased 7 percent and to Canada 3 percent in 1956.

Exports of natural gasoline increased 54 percent; Canada received the greater part of the volume.

[3] Figures on exports compiled by Mae B. Price and Elsie D. Page, of the Bureau of Mines, from records of the U. S. Department of Commerce.

TABLE 15.—LP gases [1] exported from the United States, 1947–51 (average) and 1952–56, by countries, in thousand gallons [2]

[Bureau of the Census]

Country	1947–51 (average)	1952	1953	1954	1955	1956
North America:						
Canada-Newfoundland-Labrador	33,358	42,951	56,155	58,330	56,826	55,275
Cuba	855	3,453	4,719	5,865	6,416	8,382
Mexico	21,096	40,003	49,567	72,994	95,398	88,779
Other North America	628	1,092	1,324	1,608	3,203	6,027
Total	55,937	87,499	111,765	138,797	161,843	158,463
South America:						
Argentina	123	2	(3)	1	7	1,033
Brazil	3,559	11,046	12,469	24,657	13,668	18,554
Other South America	12	5	1	144	485	348
Total	3,694	11,053	12,470	24,802	14,160	19,935
Europe:						
France	797	1	13	7	93	31
Germany	(3)		(4) 1	(4) 1	(4) 333	(4) 6
Italy	(3)	(3)	(3)	2	24	125
Other Europe	111	11	14	28	122	133
Total	908	12	28	38	572	295
Asia:						
Israel	(5) 26			(3)	(3)	37
Japan	47	27	(3)	250	461	313
Philippines	680	528	243	269	399	21
Syria	(3)	(3)	(3)			32
Other Asia	16	(3)	(3)	24	2	35
Total	769	555	243	543	862	438
Africa	77	109	162	87	149	307
Oceania	44	68	81	41	122	68
Grand total	61,429	99,296	124,749	164,308	177,708	179,506

[1] Data include LR-gases.
[2] 4.5 pounds=1 gallon.
[3] Less than 500 gallons.
[4] West Germany.
[5] Includes Palestine.

TABLE 16.—Natural gasoline exported from the United States, 1947–51 (average) and 1952–56, by countries, in thousand gallons

[Bureau of the Census]

Country	1947–51 (average)	1952	1953	1954	1955	1956
North America:						
Canada	49,797	26,631	34,186	24,854	5,447	8,362
Mexico	90		18	16		14
Netherlands Antilles	18,303	24,049	5,604			
Trinidad and Tobago	2,723					
Other North America	9			38		
Total	70,922	50,680	39,808	24,908	5,447	8,376
Europe:						
Italy	123	638				
United Kingdom	45,294					
Other Europe	2,691					
Total	48,108	638				
Asia	1,141					
Africa	20					
Oceania:						
Australia	12,342	15,472				
New Zealand	819	2,316				
Other Oceania	213					
Total	13,374	17,788				
Grand total	133,565	69,106	39,808	24,908	5,447	8,376

TECHNOLOGY[4]

The higher national average motor-gasoline octane numbers have had a decided influence on natural-gasoline producers. The principal use of natural gasoline has been as a blending agent for motor gasoline. However, natural gasoline is generally paraffinic; consequently, it has a low octane number. Clear octane number, depending on specific content of isoparaffins, ranges from about 50 to 65 by the research-rating method. With the market demanding motor gasolines having an octane number of 90 and above, reduced quantities of natural gasoline can be used as a blending agent, thereby decreasing its acceptability and market.

A solution of this problem finding increasing adoption in the natural-gasoline industry in 1956 was catalytic re-forming of natural gasolines. Catalytic reformate has an octane-number increase that varies from 14 to 26 above that of the feedstock, depending on the severity of operating conditions, the type of catalyst, boiling range, and types of hydrocarbons present in the feed mixture. With the addition of 3 ml. of tetraethyl lead per gallon, the reformate becomes a blending stock in the 90–97 octane-number class.

In addition to re-forming, another type of process (isomerization) received considerable attention in 1956. Isomerization can be used to raise the octane number of pentanes, hexanes, and heptanes from natural-gas liquids to a level where the isomerizate becomes a high-quality blending stock for premium gasolines. Technical advances in this field were ahead of economics. Although in 1956 at least six processes were available for licensing, only a few natural gasoline processors installed C_5–C_6–C_7 isomerization units, but several were planned.

Normal butane can be processed by catalytic dehydrogenation to produce butylenes and by isomerization to produce isobutane. These two materials can be combined in alkylation processes to produce alkylate. During World War II these steps were used for aviation gasoline, but postwar economics rarely has favored use of alkylate for motor gasoline; however, the 90- to 100-octane motor gasolines appearing on the market in 1956 in some instances made alkylate an economical motor-gasoline blending stock. A trend in this direction developed, and some additional alkylation-plant capacity was installed, although most of the olefin feedstock came from byproduct (LR-) gases rather than from natural-gas liquids. Competition of petrochemicals for refining butylenes resulted in the use of some catalytic dehydrogenation capacity to produce butylenes.

Catalytic dehydrogenation of normal butane was used to an increasing extent to manufacture butadiene for synthetic rubber. All of the 42-percent increase in butadiene capacity in 1956 consisted of normal butane-dehydrogenation plants.

Through catalytic conversion processes, such as dehydrogenation, isomerization, and reforming, natural-gasoline producers in 1956 began entering a new phase to produce motor gasoline or blending materials of high quality. These processing trends became necessary to upgrade natural gasolines to meet increasing motor-gasoline-quality requirements.

[4] By J. D. Lankford, chemical engineer, staff adviser, Division of Petroleum.

The lighter natural-gas liquids—propane and butane—were used to a slightly increased extent in 1956 as motor fuel. Internal-combustion-engine fuel ranked fourth in use, supplying 11.7 percent of sales. As a motor fuel LP-gas has advantages over gasoline in that it has a high octane number, leaves minimum engine deposits, and produces little or no noxious exhaust fumes or lubricant contaminants. Disadvantages are the special fuel-handling equipment, pressure fuel tanks, and slightly less available energy per gallon. Offsetting some of the disadvantages are favorable LP-gas prices, particularly freedom from fumes in such uses as public transportation in cities. Several bus systems and motortruck lines in 1956 began using LP-gas motor fuel—an increasing trend over the previous year.

Storage of LP-gas in underground caverns made by dissolving salt from salt formations with water increased substantially in 1956. Such storage proved to be considerably cheaper than aboveground storage facilities and made possible the storage of stocks produced in seasons of low consumption for use in high consumption seasons. Underground storage increases in LP-gas from spring to fall in 1956 amounted to more than 400 million gallons. As an example of an LP-gas-underground-storage project, the Atlantic Refining Co.,[5] completed a salt-cavern project in January 1956 and reported cost estimates of $2.15 per barrel of storage capacity compared with about $20 per barrel for aboveground steel-pressure vessels for propane storage. The salt was removed by introducing fresh water into wells drilled into the salt formation at a depth of about 2,700 feet. As the fresh water was added through tubing, brine was withdrawn through the casing. Two cavities were made, each having a capacity of about 50,000 barrels. It is estimated that more storage capacity could be added to these reservoirs at an additional cost of only about $1 a barrel.

[5] Petroleum Refiner, vol. 36, No. 4, April 1957, p. 149.

Crude Petroleum and Petroleum Products

By James G. Kirby, Albert T. Coumbe, and Gladys Hilton

Contents

GENERAL SUMMARY

TOTAL demand [1] for petroleum and petroleum products continued to increase in 1956 and was 4.3 percent above the previous record high established in 1955. Anticipating increases in demand similar to 1955, record crude-oil production and refinery runs were maintained throughout the year. Product stocks increased substantially above those in the preceding year during the summer, and at the end of October both crude-oil and product stocks were at an alltime high. Weather conditions in the last quarter were warmer than normal,

[1] Certain terms, as utilized in this chapter, are more or less unique to the petroleum industry. Principal terms and their meanings are as follows:
Total demand.—A derived figure representing total new supply plus decreased or minus increases in reported stocks. Because there are substantial secondary and consumers' stocks that are not reported to the Bureau of Mines, this figure varies considerably from consumption.
Domestic demand.—Total demand less exports.
New supply of all oils.—The sum of crude oil production, plus production of natural-gas liquids, plus benzol (coke-oven) used for motor fuel plus imports of crude oil and other petroleum products.
Transfers.—Crude oil conveyed to fuel oil stocks without processing, or reclassification of products from one product category to another.
All oils.—Crude petroleum, natural-gas liquids, and their derivatives.
Principal products.—Gasoline, kerosine, distillate fuel oil, and residual fuel oil.
Exports.—Total shipments from continental United States, including shipments to United States Territories and possessions.
Barrels.—42 gallons per barrel.

resulting in a weak domestic demand for heating oils. Emergency shipments to Europe, which began in November to relieve the oil shortage there created by the invasion of Egypt and blocking of the Suez Canal, helped to reduce the stock surplus. Exports, which were below those of year ago on October 31, increased in the last 2 months and at the close of 1956 were above the 1955 total by 17.0 percent for the year.

Domestic demand for petroleum and petroleum products gained only 3.8 percent compared with the 9.0-percent increase in 1955. For the first 6 months of 1956, domestic demand was 7.6 percent above the corresponding period in 1955 but dropped to a 3.5-percent increase in the third quarter and to a 2.7-percent decrease in the fourth quarter.

The total new supply of all oils in 1956 was 3.4 billion barrels; this included imports of 0.5 billion barrels, which represented 15.2 percent of the total supply, as compared with 14.1 percent in 1955. At the end of 1956 total stocks of all oils were 65.5 million barrels higher than on December 31, 1955. Stocks of refined products were up 58.1 million barrels, natural-gas liquids increased 7.0 million barrels, and stocks of crude petroleum gained 0.4 million barrels during the year.

TABLE 1.—Salient statistics of crude petroleum, refined products, and natural-gas liquids in the United States, 1952–56 [1]

	1952	1953	1954	1955	1956 [2]
Crude petroleum:					
Domestic production......thousand barrels [3]..	2,289,836	2,357,082	2,314,988	2,484,428	2,617,432
World production..........do....	4,531,114	4,798,348	5,017,243	5,626,225	6,125,425
United States proportion..........percent..	51	49	46	44	43
Imports [4]..........thousand barrels [3]..	209,591	236,455	239,479	285,421	341,833
Exports [5]..........do....	26,696	19,931	13,599	11,571	28,414
Stocks, end of year..........do....	271,928	274,445	258,385	265,610	266,014
Runs to stills..........do....	2,441,259	2,554,865	2,539,564	2,730,218	2,905,106
Value of domestic production at wells:					
Total..........thousand barrels..	5,785,230	6,327,100	6,424,930	6,870,380	7,263,463
Average per barrel..........	$2.53	$2.68	$2.78	$2.77	$2.78
Total producing oil wells Dec. 31..........	488,520	498,940	511,200	524,010	551,170
Total oil wells completed during year (successful wells)..........	23,466	25,762	29,773	31,567	31,158
Refined products:					
Imports [5]..........thousand barrels [3]..	138,916	141,044	144,476	170,143	180,206
Exports [5]..........do....	131,492	126,660	116,134	122,617	128,531
Stocks, end of year..........do....	394,019	440,634	442,510	435,685	493,818
Output of gasoline..........do....	1,178,027	1,266,376	1,261,304	1,373,950	1,428,100
Yield of gasoline..........percent..	42.4	43.9	43.8	44.0	43.4
Average dealers' net price (excluding tax) of gasoline in 50 United States cities cents per gallon [6]..	15.27	15.95	16.19	16.18	16.34
Completed refineries, end of year..........	343	337	326	318	319
Daily crude-oil capacity thousand barrels [3]..	7,639	8,007	8,421	8,632	9,124
Natural-gas liquids:					
Production..........thousand barrels [3]..	223,515	238,579	252,133	281,371	287,652
Stocks, end of year..........do....	7,807	10,428	14,038	13,564	20,559

[1] Data, including imports and exports, are for continental United States.
[2] Preliminary figures.
[3] 42 gallons per barrel.
[4] Bureau of Mines.
[5] U. S. Department of Commerce, except Alaska and Hawaii, which are Bureau of Mines data. Exports include shipments to Territories.
[6] Platt's Oilgram Price Service.

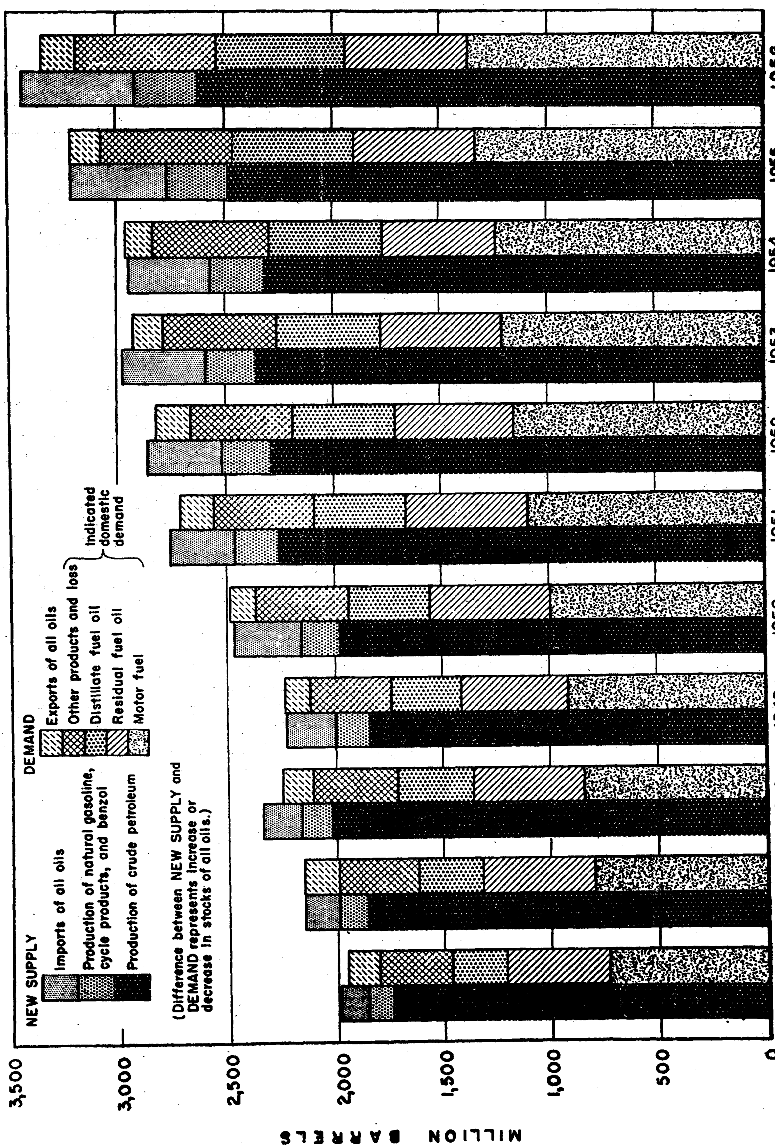

FIGURE 1.—Supply and demand of all oils in the United States, 1946–56.

TABLE 2.—Supply and demand of all oils [1] in continental United States, 1954 (total) and 1955–56 by months

(Thousand barrels)

	1955													1954 total
	January	February	March	April	May	June	July	August	September	October	November	December	Total	
New supply;														
Domestic production:														
Crude petroleum	209,601	191,342	213,453	206,668	207,067	197,844	205,614	206,619	202,037	211,866	210,454	221,863	2,484,428	2,314,988
Natural-gas liquids	24,530	22,322	23,652	21,838	22,080	21,545	22,448	23,072	23,322	24,824	25,302	26,436	281,371	252,133
Benzol, etc	62	36	72	65	55	40	30	40	34	27	24	41	526	507
Total production	234,193	213,700	237,177	228,571	229,202	219,429	228,092	229,731	225,393	236,717	235,780	248,340	2,766,325	2,567,628
Imports:														
Crude petroleum [2]	22,922	21,033	22,989	20,907	23,017	22,934	25,788	23,406	24,882	25,439	24,685	27,419	285,421	239,479
Refined products [3]	18,489	17,679	17,598	13,125	12,300	11,918	9,262	12,665	11,849	11,125	14,832	19,301	170,143	144,476
Total new supply	275,604	252,412	277,764	262,603	264,519	254,281	263,142	265,802	262,124	273,281	275,297	295,060	3,221,889	2,951,583
Increase (+) or decrease (−) in stocks	−13,756	−16,854	+2,107	+15,929	+16,708	+1,648	+16,189	+627	+8,636	+14,123	−11,180	−34,251	−74	−10,574
Demand:														
Total demand	289,360	269,266	275,657	246,674	247,811	252,633	246,953	265,175	253,488	259,158	286,477	329,311	3,221,963	2,962,157
Exports: [3]														
Crude petroleum	381	976	833	1,431	1,166	1,053	887	1,191	870	871	872	1,040	11,571	13,599
Refined products	10,076	9,172	9,513	9,580	10,825	10,957	11,156	11,926	10,308	10,805	8,491	9,808	122,617	116,134
Domestic demand:														
Gasoline	97,241	89,511	106,626	112,152	116,824	121,477	116,795	122,848	114,314	113,929	110,250	112,238	1,334,205	1,230,595
Kerosine	16,993	15,054	10,950	5,765	3,934	4,320	5,516	6,012	7,107	9,047	13,503	18,607	116,808	118,311
Distillate fuel oil	73,778	68,525	58,259	36,973	31,762	29,939	28,378	33,732	37,326	38,771	59,766	83,919	581,128	526,347
Residual fuel oil	55,496	51,495	51,459	43,874	41,926	40,780	38,948	41,464	38,085	41,750	51,087	60,693	557,057	522,317
Lubricants	3,157	2,925	3,665	3,587	3,769	3,745	3,493	3,986	3,567	3,726	3,708	3,149	42,477	38,537
Miscellaneous	32,238	31,608	34,352	33,312	37,605	40,362	41,780	44,016	41,911	40,259	38,800	39,857	456,100	396,317
Total domestic demand	278,903	259,118	265,311	235,663	235,820	240,623	234,910	252,058	242,310	247,482	277,114	318,463	3,087,775	2,832,424
Stocks:														
Crude petroleum	260,156	258,630	264,430	275,232	276,948	270,850	264,601	256,427	256,269	259,201	260,707	265,610	265,610	258,385
Crude petroleum	12,973	12,004	12,805	13,460	14,976	16,327	17,553	18,048	17,658	18,144	16,450	13,564	13,564	14,038
Refined products	428,048	413,689	409,195	413,667	427,143	433,538	454,750	463,056	472,240	482,945	471,953	435,685	435,685	442,510
Total stocks	701,177	684,323	686,430	702,359	719,067	720,715	736,904	737,531	746,167	760,290	749,110	714,859	714,859	714,933

	1956 [4]													1955 total
	January	February	March	April	May	June	July	August	September	October	November	December	Total	
New supply:														
Domestic production:														
Crude petroleum	223, 160	209, 027	225, 625	214, 386	218, 976	212, 997	219, 805	223, 046	211, 616	215, 936	214, 174	228, 684	2, 617, 432	2, 484, 428
Natural-gas liquids	24, 854	23, 382	24, 790	23, 102	23, 554	22, 773	23, 093	24, 120	23, 747	24, 245	24, 221	25, 781	287, 652	281, 371
Benzol, etc	67	40	39	55	53	53	42	23	28	32	43	29	504	526
Total production	248, 081	232, 449	250, 454	237, 543	242, 583	235, 823	242, 940	247, 189	235, 381	240, 213	238, 438	254, 494	2, 905, 588	2, 766, 325
Imports:														
Crude petroleum [2]	24, 944	24, 584	28, 942	24, 462	29, 074	29, 606	33, 593	31, 029	31, 281	31, 123	26, 124	27, 071	341, 833	285, 421
Refined products [2]	19, 137	16, 618	15, 224	14, 695	14, 825	13, 159	12, 025	12, 339	12, 276	16, 660	14, 722	18, 526	180, 206	170, 143
Total new supply	292, 162	273, 651	294, 620	276, 700	286, 482	278, 588	288, 558	290, 557	278, 938	287, 996	279, 284	300, 091	3, 427, 627	3, 221, 889
Increase (+) or decrease (−) in stocks	−19, 842	−8, 056	−78	+11, 545	+19, 776	+16, 353	+33, 057	+21, 682	+19, 725	+10, 507	−17, 822	−21, 315	+65, 532	−74
Demand:														
Total demand	312, 004	281, 707	294, 698	265, 155	266, 706	262, 235	255, 501	268, 875	259, 213	277, 489	297, 106	321, 406	3, 362, 095	3, 221, 963
Exports: [3]														
Crude petroleum	994	501	1, 155	610	1, 236	866	748	1, 179	805	1, 444	8, 332	10, 544	28, 414	11, 571
Refined products	8, 377	7, 378	8, 707	10, 092	9, 556	9, 100	10, 519	10, 794	9, 861	10, 814	13, 911	19, 422	128, 531	122, 617
Domestic demand:														
Gasoline	100, 519	98, 005	112, 412	113, 034	123, 560	126, 838	120, 708	125, 847	111, 574	119, 204	112, 113	108, 096	1, 371, 910	1, 334, 205
Kerosine	17, 426	13, 830	12, 140	7, 960	5, 170	4, 364	6, 213	6, 850	8, 151	8, 714	12, 360	14, 114	117, 292	116, 808
Distillate fuel oil	83, 741	69, 165	65, 631	46, 588	38, 300	33, 469	31, 490	33, 033	41, 088	44, 254	57, 854	71, 394	616, 007	581, 128
Residual fuel oil	59, 673	54, 412	52, 493	46, 470	43, 505	39, 889	36, 144	39, 422	39, 452	45, 461	50, 389	54, 381	561, 691	557, 057
Lubricants	3, 512	3, 415	3, 478	3, 767	3, 981	3, 599	3, 717	3, 855	3, 495	4, 118	3, 506	3, 491	43, 934	42, 477
Miscellaneous	37, 762	35, 001	38, 682	36, 634	41, 398	44, 110	45, 962	47, 895	44, 787	43, 480	38, 641	39, 964	494, 316	456, 100
Total domestic demand	302, 633	273, 828	284, 836	254, 453	255, 914	252, 269	244, 234	256, 902	248, 547	265, 231	274, 863	291, 440	3, 205, 150	3, 087, 775
Stocks:														
Crude petroleum	261, 592	259, 504	265, 683	277, 121	277, 497	274, 491	277, 008	279, 944	278, 791	286, 560	275, 995	266, 014	266, 014	265, 610
Natural-gas liquids	11, 605	11, 392	12, 642	14, 356	16, 717	19, 586	21, 595	22, 307	23, 653	24, 178	22, 934	20, 559	20, 559	13, 564
Refined products	421, 820	416, 065	408, 558	406, 951	423, 990	440, 480	469, 011	487, 045	506, 577	508, 790	502, 777	493, 818	493, 818	435, 685
Total stocks	695, 017	686, 961	686, 883	698, 428	718, 204	734, 557	767, 614	789, 296	809, 021	819, 528	801, 706	780, 391	780, 391	714, 859

[1] For definition of this and other terms used in the petroleum industry, see text footnote 1 at the beginning of this chapter.
[2] Bureau of Mines.
[3] U. S. Department of Commerce, except for exports to Alaska and Hawaii, which are Bureau of Mines data.
[4] Preliminary figures.

TABLE 3.—Demand for all oils [1] in continental United States, 1947–56

(Million barrels)

Year	Domestic demand	Exports	Total demand	Year	Domestic demand	Exports	Total demand
1947	1,989.8	164.5	2,154.3	1952	2,664.4	158.2	2,822.6
1948	2,113.7	134.7	2,248.4	1953	2,775.3	146.6	2,921.9
1949	2,118.2	119.4	2,237.6	1954	2,832.4	129.7	2,962.1
1950	2,375.1	111.3	2,486.4	1955	3,087.8	134.2	3,222.0
1951	2,569.8	154.1	2,723.9	1956 [2]	3,205.2	156.9	3,362.1

[1] See text footnote 1 at beginning of this chapter.
[2] Preliminary figures.

DEMAND BY PRODUCTS

Since the major portion of the indicated consumption of crude oil in continental United States is converted into products at refineries before sale to ultimate consumers, the analysis of demand trends involves consideration of each of the major products. The fuel oils (residual, distillate, and kerosine) compete directly with natural gas or coal in heating, cooking, and industrial uses. Gasoline and diesel fuel are the major fuels in the transportation field. The other products serve a wide variety of uses in competition with other oil products as fuel and in special uses outside the fuels field. The use of jet fuel (a blend of low-grade gasoline, kerosine, and distillate) has advanced rapidly in the last few years. To date its use has been limited mostly to the military establishment.

Gasoline.—Gasoline represented 41.9 percent of the total demand for all oils in 1956, compared with 42.5 percent in 1955. Domestic demand for gasoline, figured on a comparable basis with 1955 (when jet fuel was included in the gasoline imports), increased 3.2 percent. A breakdown of the domestic demand by uses indicates that civilian highway use accounted for 84.7 percent, and aviation gasoline 5.3 percent, leaving a balance of 10.0 percent for nonhighway vehicles, military vehicles, stationary engines, and losses. All figures for aviation gasoline and commercial naphthas are included in the total gasoline demand.

Residual Fuel Oil.—The total demand for residual fuel oil declined 0.2 percent in 1956. Domestic demand increased 0.8 percent, but exports were down 17.2 percent for the year. For the first half of 1956 demand maintained a slight increase over the preceding year, but for the balance of the year it was below the 1955 average. Data compiled by the Interstate Commerce Commission indicated continued dieselization of the railroads as accounting for the decline of 4.2 million barrels (28 percent) in the amount of residual fuel oil used by the nations class I railroads in 1956.

The 5-million-barrel stock increase partly offset the large reduction in residual oil stocks in 1955. Production increased 6.4 million, and imports gained 9.8 million barrels for the year. The refinery yield of residual fuel continued to decline from 15.3 percent in 1955 to 14.7 percent in 1956.

Distillate Fuel Oil.—The total demand for distillate fuel increased 7.4 percent in 1956, including 6.0-percent gains in domestic demand and 39.8-percent gains in exports.

The demand for heating oils, which represented 58.4 percent of the total domestic sales of distillate in 1956, increased only 6 percent compared with an increase of 11 percent in 1955, owing primarily to warmer weather.

Exports for the first 10 months of 1956 were below the previous years' levels; then European nations were cut off from their source of fuel supplies in the Middle East, and heavy shipments were made from this country to relieve the critical shortage abroad.

Kerosine.—The total demand for kerosine increased slightly in 1956; the gain was in domestic demand, as exports were slightly below those in 1955. Kerosine used as range oil, including cooking, water heating, and small space heating, composed 74 percent of the total domestic sales.

Kerosine used for blending in jet fuel is included in the statistics of that product; however, some kerosine is sold as such to commercial airlines for use as fuel in turboprop jet aircraft. These sales are shown in the annual Fuel-Oil and Kerosine-Sales Survey as sales of jet fuel.

Other Products.—The total demand for all other products includes crude-oil exports and losses and refinery shortage or overage. Domestic demand for other products increased 8.0 percent in 1956, with gains reported for all products in this category except road oil. Exports of crude oil were much higher than normal due to heavy shipments to Europe in November and December.

Shipments to United States Territories and Possessions.—Domestic demand, as defined in this chapter, refers to demand in continental United States only. Shipments from the United States to Territories and possessions are included with exports. Any foreign receipts into these areas are not included in the total imports shown.

Shipments from the Territories and possessions to foreign countries are excluded from the total exports. Shipments from the Territories to the United States are included in the total continental imports.

TABLE 4.—Imports of petroleum products into United States Territories and possessions, 1955–56 [1]

(Thousand barrels)

	1955			1956 [2]		
	From continental United States	Foreign	Total	From continental United States	Foreign	Total
Gasoline	8,647	294	8,941	7,507	325	7,832
Kerosine	844		844	423	232	655
Distillate fuel oil	2,973	677	3,650	2,950	412	3,362
Residual fuel oil	5,799	3,350	9,149	6,276	3,414	9,690
Jet fuel [3]				3	505	508
Lubricants:						
Grease	5		5	5		5
Oil	195		195	213		213
Coke	54		54	46		46
Asphalt	90	28	118	219	18	237
Liquefied gases	46		46			
Unfinished oils					760	760
Total	18,653	4,349	23,002	17,642	5,666	23,308

[1] Source: U. S. Department of Commerce, except for imports to Alaska and Hawaii from continental United States, which are Bureau of Mines data.
[2] Preliminary figures.
[3] Formerly included with gasoline.

SCOPE OF REPORT

This report deals primarily with the statistics of production, refining, distribution, and indicated consumption of crude petroleum and refined products in continental United States. The objective of the limitation to continental United States is to permit a breakdown and balancing of supply and demand of operations by States and districts. The composition of the districts used by the Bureau of Mines is explained in the next section.

The increasing volume of natural-gas liquids recovered from natural gas has made it necessary to include them with the crude-oil data, as they are either blended with refinery products or are identical with materials recovered from refinery gases. These natural-gas liquids are recovered at special plants away from the oil refineries.

Most of the data were compiled by the Bureau of Mines from detailed reports, submitted on a voluntary basis by the various companies. These data are published monthly for release about 6 weeks after the end of the month. Complete coverage, with only minor estimates, is procured for production, stocks, and refinery operations. The Bureau of Mines used the import data as reported by the refineries for crude oil and unfinished oils. Other product imports and all export data were taken from the records of the United States Department of Commerce.

The impossibility of contacting many small producers to obtain current monthly data for crude-oil production makes it necessary to use pipeline-company reports. These companies report by States of origin, stocks on leases, oil taken from the leases, pipeline and tank-farm stocks, and crude deliveries. These data are crosschecked against reports from refineries showing crude receipts by States of origin and method of transportation. These reports include information covering final receipts by water, tank car, and trucks and cover stocks of crude oil, by States of origin, held at refineries. These data are checked further against available current and annual production figures collected by State agencies and supplemented by estimates of unreported lease stocks. The Bureau of Mines crude-production figure includes some field condensate dumped in crude lines that cannot be identified when received at refineries and included with the crude runs reported.

Individual refineries reported monthly receipts input, stocks at the beginning and end of the month, refinery production, and deliveries. Data both on product stocks at refineries and pipeline and bulk-terminal stocks are collected.

Annual canvasses provide supplemental information on the value of crude petroleum at the well, the number of producing oil wells, sales of fuel oils by uses, and refinery capacity. The table showing world production of crude oil by countries is based on monthly reports that also included data on crude movements and refinery operations. Data on crude reserves, wells drilled, and current prices were taken from sources indicated in the footnotes.

The tables on Relative Rate of Growth of Coal, Petroleum, Natural Gas, and Waterpower, which appeared in the Bituminous Coal and

Lignite chapter of the Minerals Yearbook in previous years, will be found for 1956 in the Review of the Mineral-Fuel Industries chapter of volume III.

DISTRICTS

The Bureau of Mines reported production of crude petroleum and natural-gas liquids and the number of wells drilled by States. Louisiana, New Mexico, and Texas were also reported by districts.

Louisiana is divided into a Northern Louisiana district and a Louisiana Gulf Coast district. The Gulf Coast district includes Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Tangipahoa, St. Helena, and Washington Parishes and all parishes in Louisiana south of these. All parishes not included in the Gulf Coast district are in the Northern Louisiana district.

New Mexico has two widely separated producing areas. The Southeastern district in the southeastern corner of the State comprises mainly Lea, Eddy, Chaves, and Roosevelt Counties. The Northwestern district in the northwestern corner of the State comprises mainly San Juan, Rio Arriba, Sandoval, and McKinley Counties.

The Bureau of Mines production districts in Texas correspond, with one exception, to groupings of the Texas Railroad Commission districts.

Bureau of mines district:	*Railroad Commission district*
Gulf Coast	No. 2 and No. 3.
West Texas	No. 7C and No. 8.
East Proper	Part of No. 6 (East Texas field in Cherokee, Smith, Upshur, Rush, and Gregg Counties).
Panhandle	No. 10.
Rest of State:	
North	No. 7B and No. 9.
Central	No. 1.
South	No. 4.
Other East Texas	No. 5 and No. 6 (exclusive of East proper).

The Bureau of Mines groups refinery operations into another set of districts called Refining districts. These refining districts correspond with the grouping originated by the Petroleum Administration for War during World War II and called PAW districts.

PAW district	*Refining district*
1	*East Coast*—District of Columbia and Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, and the following New York counties: Cayuga, Tompkins, Chemung, and all counties east and north thereof, and the following Pennsylvania counties: Bradford, Sullivan, Columbia, Montour, Northumberland, Dauphin, York, and all counties east thereof.
1	*Appalachian No. 1*—West Virginia and those parts of Pennsylvania and New York not included in the East Coast district.
2	*Appalachian No. 2*—The following counties of Ohio: Erie, Huron, Crawford, Marion, Delaware, Franklin, Pickaway, Ross, Pike, Scioto, and all counties east thereof.
2	*Indiana-Illinois-Kentucky*—Indiana, Illinois, Kentucky, Tennessee, Michigan, and that part of Ohio not included in the Appalachian district.

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PAW district	*Refining district*
2	*Oklahoma-Kansas-Missouri*—Oklahoma, Kansas, Missouri, Nebraska and Iowa.
2	*Minnesota-Wisconsin-North Dakota-South Dakota*—Minnesota, Wisconsin, North Dakota, and South Dakota.
3	*Texas Inland*—Texas, except the Texas Gulf Coast district.
3	*Texas Gulf Coast*—The following counties of Texas: Newton, Orange, Jefferson, Jasper, Tyler, Hardin, Liberty, Chambers, Polk, San Jacinto, Montgomery, Harris, Galveston, Waller, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Refugio, Aransas, San Patricio, Nueces, Kleberg, Kenedy, Willacy, and Cameron.
3	*Louisiana Gulf Coast*—The following parishes of Louisiana: Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Tangipahoa, St. Helena, Washington, and all parishes south thereof. Also the following counties of Mississippi: Pearl River, Stone, George, Hancock, Harrison, and Jackson; and Mobile and Baldwin Counties, Ala.
3	*North Louisiana-Arkansas*—Arkansas and those parts of Louisiana, Mississippi and Alabama not included in the Louisiana Gulf Coast district.
3	*New Mexico*—New Mexico.
4	*Rocky Mountain*—Montana, Idaho, Wyoming, Utah, and Colorado.
5	*West Coast*—Washington, Oregon, California, Nevada, and Arizona.

WORLD OIL SUPPLY

Total crude-oil production for the world in 1956 was 6,125.4 million barrels, an 8.9-percent increase for the year. The United States produced 42.7 percent of the total. United States production for the year increased 5.4 percent, while the increase for the rest of the world was 11.7 percent.

Crude oil processed at refineries throughout the world in 1956 totaled 6,079.6 million barrels, including 2,905.1 million barrels refined in the United States. Compared with 1955, crude runs to stills, worldwide, were 9.6 percent greater.

RESERVES

The American Petroleum Institute Committee on Petroleum Reserves on December 31, 1956, estimated proved reserves of crude oil in the United States to be 30.4 billion barrels. These estimates include only oil recoverable under existing economic and operating conditions.

TABLE 5.—Estimates of proved oil reserves in the United States, on December 31, 1949–56, by States [1]

(Million barrels)

State	1949	1950	1951	1952	1953	1954	1955	1956
Eastern States:								
Illinois	468	564	646	619	625	658	691	700
Indiana	50	57	51	56	62	67	62	68
Kentucky	56	56	59	56	82	85	107	149
Michigan	66	79	64	57	61	60	59	55
New York	63	59	57	53	49	46	43	40
Ohio	28	27	26	27	32	37	56	64
Pennsylvania	103	106	95	122	111	102	93	135
West Virginia	38	39	39	37	36	37	47	51
Total	872	987	1,037	1,027	1,058	1,092	1,158	1,262
Central and Southern States:								
Arkansas	297	342	337	352	358	351	330	318
Kansas	738	732	792	917	913	979	998	992
Louisiana	1,910	[2] 2,185	[2] 2,285	[2] 2,558	[2] 2,760	[2] 2,962	[2] 3,255	3,675
Mississippi	403	386	385	359	350	412	388	368
Nebraska	2	10	16	22	26	38	57	63
New Mexico	592	592	612	733	815	806	820	836
North Dakota			5	76	128	134	185	196
Oklahoma	1,330	1,397	1,476	1,558	1,752	1,955	2,016	2,010
Texas	13,510	[2] 13,581	[2] 15,315	[2] 14,916	[2] 14,999	[2] 14,982	[2] 14,934	[2] 14,783
Total	18,782	19,225	21,223	21,491	22,101	22,619	22,983	23,241
Mountain States:								
Colorado	345	339	325	306	319	329	334	364
Montana	112	111	108	156	209	272	299	331
Utah	16	22	30	42	38	36	37	61
Wyoming	692	841	973	1,065	1,279	1,304	1,374	1,363
Total	1,165	1,313	1,436	1,569	1,845	1,941	2,044	2,119
Pacific Coast States: California	3,823	[2] 3,734	[2] 3,761	[2] 3,854	[2] 3,920	[2] 3,889	[2] 3,801	[2] 3,771
Other States [3]	7	9	11	20	21	20	26	42
Total United States	24,649	25,268	27,468	27,961	28,945	29,561	30,012	30,435

[1] From reports of Committee on Petroleum Reserves, American Petroleum Institute. Includes crude oil that may be extracted by present methods from fields completely developed or explored enough to permit reasonably accurate calculations. The change in reserves during any year represents total new discoveries, extensions, and revisions, minus production.
[2] Includes offshore reserves.
[3] Includes Alabama, Arizona, Florida, Missouri, Nevada, South Dakota, Tennessee, and Virginia.

CRUDE PETROLEUM

SUPPLY AND DEMAND

The new supply of crude petroleum in the United States is derived primarily from domestic production but has been augmented by an increasing volume of imports. Crude imports, which comprised 10.3 percent of crude supply in 1955, rose to 11.6 in 1956. The major part of the indicated demand for crude petroleum is converted into products before final consumption (98 percent in 1956), and the remainder represents exports, fuel, and losses.

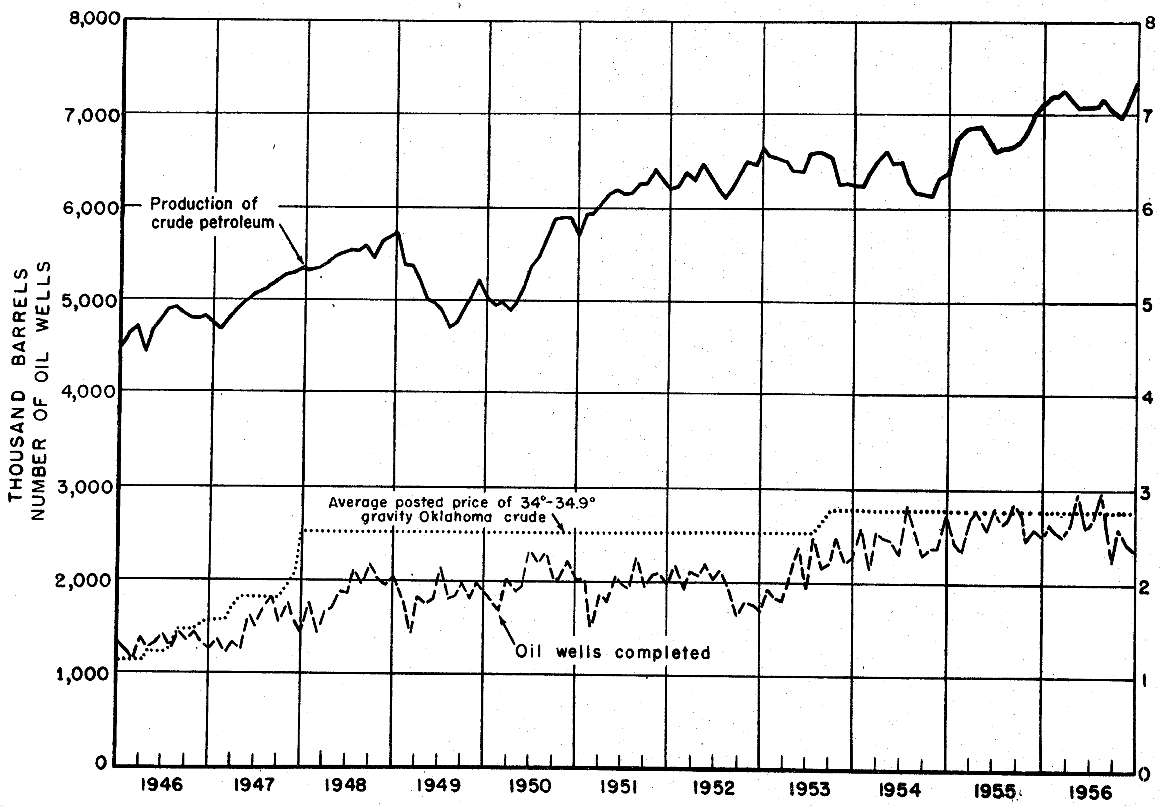

FIGURE 2.—Daily average production of crude petroleum, total number of wells completed, and average posted price per barrel of a selected grade of Oklahoma crude petroleum in the United States, 1946–56, by months.

TABLE 6.—Supply and demand [1] for crude petroleum in continental United States 1952–56

(Thousand barrels)

	1952	1953	1954	1955	1956 [2]
Production	2,289,836	2,357,082	2,314,988	2,484,428	2,617,432
Imports [3]	209,591	236,455	239,479	285,421	341,833
Total new supply	2,499,427	2,593,537	2,554,467	2,769,849	2,959,265
Increase (+) or decrease (−) in stocks, end of year	16,145	2,517	−16,060	7,225	404
Demand:					
Domestic crude	2,276,691	2,357,423	2,331,269	2,478,889	2,616,975
Foreign crude	206,591	233,597	239,258	283,735	341,886
Total demand	2,483,282	2,591,020	2,570,527	2,762,624	2,958,861
Runs to stills:					
Domestic	2,235,198	2,321,820	2,300,766	2,446,823	2,563,655
Foreign	206,061	233,045	238,798	283,385	341,451
Exports [4]	26,696	19,931	13,599	11,571	28,414
Transfers to fuel oil:					
Distillate	2,705	1,966	1,500	1,347	1,375
Residual	6,343	5,617	5,924	5,559	6,439
Other fuel and losses	6,279	8,641	9,940	13,929	17,527
Total demand	2,483,282	2,591,020	2,570,527	2,762,624	2,958,861

[1] For definition, see text footnote at the beginning of this chapter.
[2] Preliminary figures.
[3] Bureau of Mines data.
[4] U. S. Department of Commerce.

TABLE 7.—Supply of and demand for crude petroleum in continental United States 1955–56, by months

(Thousand barrels)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1955													
Supply:													
Production	209,600	191,392	213,454	206,600	206,983	198,389	205,600	206,604	201,919	211,770	210,406	221,804	2,484,521
Imports [1]	22,922	21,033	22,989	20,907	23,017	22,934	25,788	23,406	24,882	25,439	24,685	27,419	285,421
Total new supply	232,522	212,425	236,443	227,507	230,000	221,323	231,388	230,010	226,801	237,209	235,091	249,223	2,769,942
Change in stocks, end of period:													
Domestic	1,606	−2,130	6,445	10,947	712	−5,688	−7,012	−7,844	−535	2,763	2,264	4,011	5,539
Foreign	165	604	−645	−145	1,004	−410	763	−330	377	169	−758	892	1,686
Demand:													
Domestic	207,994	193,522	207,009	195,653	206,271	204,077	212,612	214,448	202,454	209,007	208,142	217,793	2,478,982
Foreign	22,757	20,429	23,634	21,052	22,013	23,344	25,025	23,736	24,505	25,270	25,443	26,527	283,735
Runs to stills:													
Domestic	206,048	190,981	205,010	193,059	203,705	201,207	209,964	211,255	199,985	206,181	205,327	214,111	2,446,833
Foreign	22,689	20,384	23,584	21,021	21,994	23,303	25,022	23,711	24,493	25,230	25,431	26,523	283,385
Exports [2]	381	976	771	1,431	1,166	1,053	887	1,191	832	871	872	1,040	11,471
Transfers:													
Distillate	122	104	125	109	113	103	116	107	101	106	113	128	1,347
Residual	443	400	408	436	492	431	469	482	437	460	409	692	5,559
Losses	1,068	1,106	745	649	814	1,324	1,179	1,438	1,111	1,429	1,433	1,826	14,122
1956 [3]													
Supply:													
Production	223,160	209,027	225,625	214,386	218,976	212,997	219,805	223,046	211,616	215,936	214,174	228,684	2,617,432
Imports [1]	24,944	24,584	28,942	24,462	29,074	29,606	33,593	31,029	31,281	31,123	26,124	27,071	341,833
Total new supply	248,104	233,611	254,567	238,848	248,050	242,603	253,398	254,075	242,897	247,059	240,298	255,755	2,959,265
Change in stocks, end of period:													
Domestic	−2,532	−1,913	5,076	11,490	−539	−3,385	833	3,677	−1,828	7,337	−8,137	−9,622	457
Foreign	−1,486	−175	1,103	−52	915	379	1,684	−741	675	432	−2,428	−359	−53
Demand:													
Domestic	225,692	210,940	220,549	202,896	219,515	216,382	218,972	219,369	213,444	208,599	222,311	238,306	2,616,975
Foreign	26,430	24,759	27,839	24,514	28,159	29,227	31,909	31,770	30,606	30,691	28,552	27,430	341,886
Runs to stills:													
Domestic	222,294	208,634	217,524	200,131	216,665	212,908	216,572	216,141	210,176	205,193	212,448	224,969	2,563,655
Foreign	26,427	24,740	27,816	24,492	28,119	29,211	31,867	31,710	30,532	30,649	28,496	27,392	341,451
Exports [2]	994	501	1,155	610	1,236	866	748	1,179	805	1,444	8,332	10,544	28,414
Transfers:													
Distillate	134	114	127	102	108	106	111	115	108	104	116	130	1,375
Residual	498	418	589	651	651	510	571	544	517	450	486	554	6,439
Losses	1,775	1,292	1,177	1,424	895	2,008	1,012	1,450	1,912	1,450	985	2,147	17,527

[1] Bureau of Mines.
[2] U. S. Department of Commerce, except Alaska and Hawaii, which are Bureau of Mines data.
[3] Preliminary figures.

TABLE 8.—Petroleum produced in the United States, 1952–56, and total 1859–1956, by States [1]

(Thousand barrels)

	1952	1953	1954	1955	1956 [2]	1859–1956 (total)
Production:						
Alabama	1, 279	1, 694	1, 584	1, 411	3, 034	12, 651
Arkansas	29, 440	29, 681	29, 130	28, 369	29, 145	971, 802
California	359, 450	365, 085	355, 865	354, 812	351, 437	10, 760, 733
Colorado	30, 381	36, 402	46, 206	52, 653	58, 546	397, 370
Florida	591	543	548	495	479	4, 827
Illinois	60, 089	59, 026	66, 798	81, 423	82, 156	1, 916, 238
Indiana	12, 037	12, 823	11, 204	10, 988	11, 513	270, 489
Kansas	114, 807	114, 566	119, 317	121, 669	123, 833	[3] 2, 834, 792
Kentucky	11, 918	11, 518	13, 791	15, 518	17, 628	[4] 334, 020
Louisiana	243, 929	256, 632	246, 558	271, 010	297, 949	4, 106, 598
Michigan	13, 251	12, 285	12, 028	11, 266	10, 879	[5] 395, 884
Mississippi	36, 310	35, 620	34, 240	37, 741	40, 572	505, 120
Montana	9, 606	11, 920	14, 195	15, 654	21, 623	250, 166
Nebraska	2, 660	6, 344	7, 783	11, 203	16, 195	52, 778
Nevada	------	------	33	64	59	156
New Mexico	58, 681	70, 441	74, 820	82, 958	87, 893	[6] 1, 109, 347
New York	4, 242	3, 800	3, 257	2, 904	2, 748	[7] 187, 806
North Dakota	1, 549	5, 183	6, 025	11, 143	13, 495	37, 420
Ohio	3, 350	3, 610	3, 880	4, 353	4, 785	644, 081
Oklahoma	190, 435	202, 570	185, 851	202, 817	215, 016	7, 419, 187
Pennsylvania	11, 233	10, 649	9, 107	8, 531	8, 230	1, 194, 560
Texas	1, 022, 139	1, 019, 164	974, 275	1, 053, 297	1, 111, 172	19, 918, 599
Utah	1, 737	1, 807	1, 905	2, 227	2, 269	[8] 12, 962
West Vigrinia	2, 602	3, 038	2, 902	2, 320	2, 179	456, 758
Wyoming	68, 074	82, 618	93, 533	99, 483	104, 483	1, 433, 908
Other States [9]	46	63	153	119	114	2, 406
Total	2, 289, 836	2, 357, 082	2, 314, 988	2, 484, 428	2, 617, 432	55, 230, 658
Value at wells:						
Total (thousand dollars)	5, 785, 230	6, 327, 100	6, 424, 930	6, 870, 380	7, 263, 463	96, 652, 371
Average per barrel	$2. 53	$2. 68	$2. 78	$2. 77	$2. 78	$1. 75

[1] For detailed figures by States, 1859–1935, see Minerals Yearbook, 1937, p. 1008.
[2] Preliminary figures.
[3] Oklahoma included with Kansas in 1905 and 1906.
[4] Includes Tennessee, 1883–1907.
[5] Figures represent 1925–56 production only; earlier years included under "Other States."
[6] Figures represent 1924–56 production only; earlier years included under "Other States."
[7] Early production in New York included with Pennsylvania.
[8] Figures represent 1946–56 production only; earlier years included under "Other States."
[9] Includes Alaska, 1912–33; Arkansas, 1920; Michigan, 1900–19; Mississippi, 1933–35; Missouri, 1899–1911, 1913–16, 1919–23, 1932–56; New Mexico, 1913, 1919–23; South Dakota, 1955–56; Tennessee, 1916–56; Utah, 1907–11, 1920, 1924–41; Virginia, 1943–56.

PRODUCTION

General

Production of crude petroleum for 1956 totaled 2,617 million barrels—an average of 7,151 thousands barrels daily. This exceeded (by 5.4 percent) the previous crude-oil production record established in 1955.

Texas, California, Louisiana, Oklahoma, Kansas, and Wyoming produced over 100 million barrels each, and the output from these States represented 84.2 percent of the United States total.

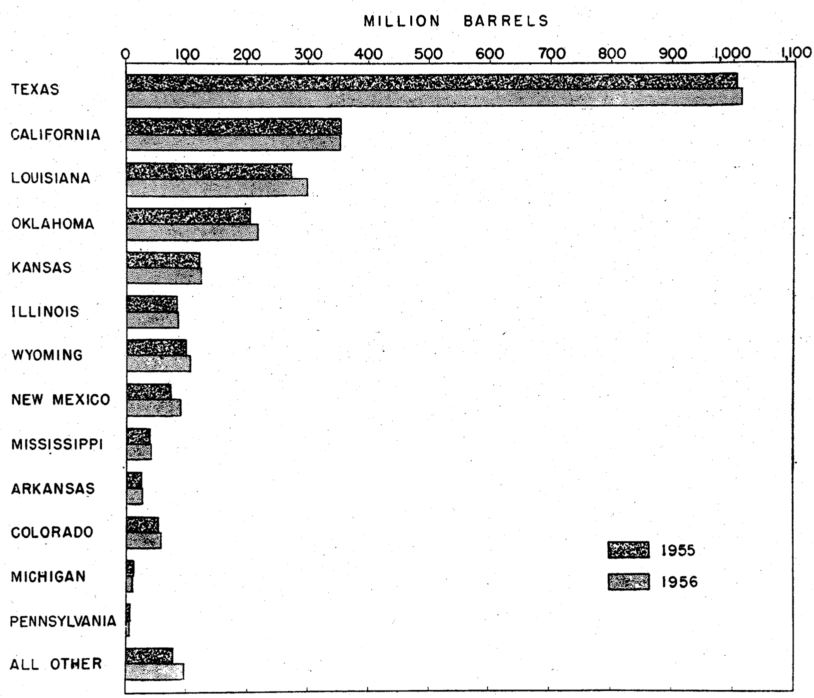

FIGURE 3.—Production of crude petroleum in the United States, 1955–56, by States.

TABLE 9.—Production of crude petroleum in the United States in 1955–56, by States and months

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
1955													
Alabama	133	114	110	85	115	116	118	115	116	115	138	136	1,411
Arkansas	2,393	2,216	2,432	2,346	2,408	2,324	2,377	2,388	2,414	2,396	2,283	2,392	28,369
California [1]	29,880	27,076	30,124	29,191	30,233	29,291	30,163	30,262	29,075	29,978	29,294	30,245	354,812
Colorado	4,261	3,819	4,275	4,210	4,360	4,269	4,504	4,585	4,518	4,622	4,436	4,794	52,653
Florida	43	35	40	39	42	40	44	45	40	42	43	42	495
Illinois	6,304	6,016	6,722	6,629	6,925	6,983	6,953	7,105	6,929	6,901	6,879	7,077	81,423
Indiana	912	803	889	886	945	972	956	971	836	920	918	980	10,988
Kansas	10,559	9,569	10,670	10,092	9,510	9,620	10,531	10,366	9,880	10,442	9,993	10,437	121,669
Kentucky	1,200	1,084	1,229	1,228	1,293	1,294	1,302	1,391	1,328	1,397	1,337	1,435	15,518
Louisiana	21,909	20,182	22,626	22,169	23,121	21,267	22,474	22,792	22,677	23,651	23,516	24,626	271,010
Michigan [2]	977	916	1,000	940	941	940	919	963	922	919	898	931	11,266
Mississippi	2,948	2,726	3,028	2,936	3,088	3,073	3,194	3,288	3,314	3,404	3,309	3,433	37,741
Montana [3]	1,381	1,229	1,377	1,329	1,317	1,313	1,276	1,304	1,176	1,198	1,250	1,504	15,654
Nebraska	812	708	845	792	900	932	952	979	946	1,030	1,060	1,247	11,203
New Mexico	6,840	6,271	6,911	6,727	6,872	6,705	6,929	7,070	6,714	7,259	7,100	7,560	82,958
New York	240	230	255	243	248	245	240	265	245	234	230	229	2,904
North Dakota	935	910	892	709	609	860	1,142	1,038	1,060	697	1,086	1,205	11,143
Ohio	321	300	367	347	365	379	349	406	376	380	370	393	4,353
Oklahoma	16,238	15,709	17,413	16,828	16,481	16,139	17,049	17,011	16,428	17,167	17,502	18,852	202,817
Pennsylvania	667	617	732	716	697	762	744	763	742	725	683	683	8,531
Texas	92,105	83,060	92,861	89,788	87,836	81,752	84,314	84,393	83,510	89,529	89,656	94,493	1,053,297
Utah	176	171	176	185	196	191	203	204	202	230	116	177	2,227
West Virginia	197	179	215	193	194	206	190	200	187	184	191	184	2,320
Wyoming	8,155	7,389	8,245	8,042	8,354	8,155	8,674	8,703	8,390	8,433	8,153	8,790	99,483
Other States	15	13	19	18	17	16	17	12	12	13	13	18	[4] 183
Total: 1955	209,601	191,342	213,453	206,668	207,067	197,844	205,614	206,619	202,037	211,866	210,454	221,863	2,484,428
1954	193,437	178,644	201,763	198,502	200,627	194,974	194,098	190,388	184,325	189,724	190,372	198,134	2,314,988
Daily average, 1955	6,761	6,834	6,886	6,889	6,680	6,595	6,633	6,665	6,735	6,834	7,015	7,157	6,807
Pennsylvania grade (included above)	1,208	1,120	1,312	1,258	1,251	1,333	1,280	1,348	1,286	1,254	1,213	1,209	15,072

See footnotes at end of table.

TABLE 9.—Production of crude petroleum in the United States in 1955–56, by States and months—Continued

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
1956 [5]													
Alabama	151	142	175	198	202	257	292	336	281	301	341	358	3,034
Arkansas	2,356	2,229	2,401	2,379	2,478	2,382	2,502	2,495	2,394	2,468	2,508	2,553	29,145
California	30,116	28,123	29,983	28,914	29,954	28,845	29,823	29,732	28,651	29,511	28,526	29,259	351,437
Colorado	4,886	4,692	4,954	4,908	5,178	4,927	4,954	4,847	4,754	4,838	4,667	4,941	58,546
Florida	43	39	43	40	40	39	41	40	38	39	38	39	479
Illinois	6,964	6,460	7,043	6,817	7,067	6,692	6,817	6,990	6,568	7,107	6,714	6,917	82,156
Indiana	848	817	879	828	982	940	974	901	1,069	1,044	1,051	1,180	11,513
Kansas	10,498	9,802	10,751	10,320	10,394	10,345	10,524	10,775	9,950	10,148	9,986	10,340	123,833
Kentucky	1,461	1,410	1,487	1,430	1,497	1,444	1,477	1,471	1,378	1,533	1,492	1,548	17,628
Louisiana	24,643	23,346	25,443	24,681	24,651	24,124	24,181	24,396	23,767	24,285	25,106	29,326	297,949
Michigan	934	988	915	884	939	869	908	917	844	929	859	893	10,879
Mississippi	3,443	3,210	3,529	3,250	3,376	3,310	3,423	3,442	3,324	3,410	3,338	3,517	40,572
Montana	1,698	1,565	1,784	1,700	1,760	1,770	1,891	1,812	1,741	1,841	1,948	2,113	21,623
Nebraska	1,126	1,165	1,345	1,317	1,348	1,349	1,436	1,370	1,358	1,459	1,333	1,589	16,195
New Mexico	7,674	6,805	7,563	7,103	7,173	7,025	7,273	7,413	7,298	7,522	7,302	7,742	87,893
New York	231	222	224	227	240	226	231	239	210	244	223	231	2,748
North Dakota	1,374	1,035	1,300	892	849	1,086	1,175	1,197	1,121	933	1,241	1,292	13,495
Ohio	382	365	379	385	403	381	412	424	403	456	406	389	4,785
Oklahoma	18,907	17,919	19,324	17,733	17,706	17,392	17,790	18,005	16,957	17,223	17,164	18,896	215,016
Pennsylvania	715	615	658	650	732	704	693	721	654	733	672	683	8,230
Texas	95,400	89,370	96,154	91,094	92,835	89,853	93,755	96,056	90,005	90,632	90,255	95,763	1,111,172
Utah	187	171	144	131	145	123	172	272	218	229	231	246	2,269
West Virginia	178	180	182	177	195	185	183	193	171	194	176	165	2,179
Wyoming	8,930	8,341	8,950	8,313	8,816	8,712	8,864	8,987	8,449	8,842	8,585	8,694	104,483
Other States	15	16	15	15	16	17	14	15	13	15	12	10	[6] 173
Total: 1956	223,160	209,027	225,625	214,386	218,976	212,997	219,805	223,046	211,616	215,936	214,174	228,684	2,617,432
1955	209,601	191,342	213,453	206,668	207,067	197,844	205,614	206,619	202,037	211,866	210,454	221,863	2,484,428
Daily average, 1956	7,199	7,208	7,278	7,146	7,064	7,100	7,091	7,195	7,054	6,966	7,139	7,377	7,151
Pennsylvania grade (included above)	1,230	1,124	1,171	1,165	1,283	1,223	1,223	1,270	1,141	1,308	1,189	1,192	14,519

[1] American Petroleum Institute.
[2] Michigan Department of Conservation.
[3] Montana Oil Conservation Board.
[4] Missouri (72), Nevada (64), South Dakota (30), Tennessee (13) and Virginia (4).
[5] Preliminary figures.
[6] Missouri (59), Nevada (59), South Dakota (32), Tennessee (14) and Virginia (9).

TABLE 10.—Percentage of total crude petroleum produced in the United States, 1947–56, by States

State	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
Texas	44.2	44.7	40.4	42.1	45.0	44.6	43.2	42.1	42.4	42.5
California	17.9	16.8	18.1	16.6	15.8	15.7	15.5	15.4	14.3	13.4
Louisiana	8.6	9.0	10.4	10.6	10.3	10.7	10.9	10.6	10.9	11.3
Oklahoma	7.6	7.7	8.2	8.3	8.3	8.3	8.6	8.0	8.2	8.2
Kansas	5.7	5.5	5.5	5.5	5.1	5.0	4.9	5.2	4.9	4.7
Wyoming	2.4	2.7	2.6	3.1	3.1	3.0	3.5	4.0	4.0	4.0
New Mexico	2.2	2.4	2.6	2.4	2.3	2.6	3.0	3.2	3.3	3.4
Illinois	3.6	3.2	3.5	3.1	2.7	2.6	2.5	2.9	3.3	3.1
Colorado	.8	.9	1.3	1.2	1.2	1.3	1.5	2.0	2.1	2.2
Mississippi	1.9	2.3	2.1	1.9	1.7	1.6	1.5	1.5	1.5	1.6
Arkansas	1.6	1.6	1.6	1.6	1.3	1.3	1.3	1.3	1.1	1.1
Montana	.5	.5	.5	.4	.4	.4	.5	.6	.6	.8
Kentucky	.5	.4	.5	.5	.5	.5	.5	.6	.6	.7
Michigan	.9	.8	.9	.8	.6	.6	.5	.5	.5	.4
Other States	1.6	1.5	1.8	1.9	1.7	1.8	2.1	2.1	2.3	2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Preliminary figures.

TABLE 11.—Production of crude petroleum in leading fields in the United States, 1955–56, and total production since discovery [1] in thousand barrels

[Oil and Gas Journal]

Field	State	1955	1956	Total since discovery [2]
East Texas	Texas	79,673	64,838	3,224,691
Wilmington	California	38,886	36,888	767,430
Sho-Vel-Tum	Oklahoma	[3] 30,316	29,717	444,299
Rangely	Colorado	23,678	28,302	217,820
Kelly-Snyder	Texas	21,773	25,103	167,589
Ventura	California	26,948	24,372	560,992
Huntington Beach	do	24,253	22,536	592,016
Spraberry Trend Area	Texas	20,785	21,100	138,236
Golden Trend	Oklahoma	[4] 19,039	20,204	136,147
Goldsmith (all fields)	Texas	15,744	18,647	219,875
Cowden-North, South, Johnson & Foster.	do	9,111	16,634	264,829
Coalinga Nose	California	16,416	16,497	266,504
South Pass, Block 24	Louisiana	8,481	16,362	33,489
Wasson—66 and 72	Texas	15,673	15,689	304,348
Midway-Sunset	California	14,752	15,131	828,178
Burbank	Oklahoma	[5] 10,139	13,519	319,669
Cuyama, South	California	12,674	12,825	88,859
Hawkins	Texas	16,843	12,025	212,108
Elk Basin and South	Montana, Wyoming	9,567	11,861	115,339
San Ardo	California	10,931	11,732	56,974
Hastings	Texas	11,655	11,410	276,109
Slaughter	do	11,277	11,104	232,788
Denton	New Mexico	11,031	10,778	47,124
Eunice-Monument	do	10,544	10,527	275,041
Webster	Texas	10,572	10,508	222,617
Caillou Island	Louisiana	8,998	9,849	105,512
Loudon	Illinois	7,535	9,828	197,845
Conroe and West	Texas	9,995	9,774	362,134
Yates	do	9,884	9,690	440,706
McElroy	do	6,912	9,636	147,808
Seeligson (all zones)	do	10,060	9,604	152,979
Tom O'Connor	do	9,738	9,461	224,494
Diamond M	do	9,343	9,404	69,034
Katy, North	do	9,151	9,353	96,464
Clay City	Illinois	10,300	9,210	187,768
Bradford-Allegheny [6]	Pennsylvania-New York	9,424	9,184	667,136
Thompson, North and South	Texas	8,743	9,032	213,154
Levelland	do	9,556	8,826	92,796
Weeks Island	Louisiana	8,232	8,474	66,549
Caddo	do	9,136	8,471	231,240
Long Beach	California	9,992	7,772	799,182
Buena Vista	do	7,711	7,756	455,844
Keystone	Texas	10,667	7,505	145,890
Kern Bluff, Front and River	Californai	5,827	7,434	427,134

See footnotes at end of table.

TABLE 11.—Production of crude petroleum in leading fields in the United States, 1955–56, and total production since discovery [1] in thousand barrels—Continued

Field	State	1955	1956	Total since discovery [2]
Howard Glasscock	Texas	7,647	7,308	186,302
Russell and North	do	5,539	7,266	23,528
Aqua Dulce-Stratton	do	7,537	7,055	134,566
Jameson	do	7,691	6,968	32,834
Caprock and East	New Mexico		6,942	20,956
Brea-Olinda	California	7,485	6,878	251,064
Sand Hills	Texas	5,111	6,788	22,465
Cogdell	do	6,507	6,861	47,102
Delhi-Big Creek	Louisiana	6,165	6,764	87,218
Salem	Illinois	7,673	6,606	252,334
Fullerton, North and South	Texas	6,728	6,434	118,180
West Ranch	do	5,602	6,279	103,021
Coles Levee, North and South	California	6,589	6,201	106,053
Midland Farms	Texas	6,962	6,105	44,134
Hull-Merchant	do	5,918	6,058	136,696
Elk Hills	California	6,791	5,993	236,428
Oregon Basin, North and South	Wyoming	5,796	5,979	77,296
Baxterville	Mississippi	5,267	5,958	56,085
Prentice	Texas	5,615	5,918	19,428
Van	do	8,834	5,824	265,422
Old Ocean	do	5,369	5,822	97,889
Plymouth and East	do	5,097	5,816	94,741
TXL	do	9,214	5,759	130,504
Block 31	do	5,210	5,739	36,925
Adena	Colorado	5,867	5,709	16,327
Seminole and West	Texas	5,524	5,617	96,538
Andector	do	5,618	5,488	50,470
Hamilton Dome	Wyoming		5,418	44,129
Pierce Junction	Texas		5,339	64,515
Elk City	Oklahoma	6,277	5,326	43,569
Timbalier Bay	Louisiana		5,301	16,592
Garland	Wyoming	5,022	5,281	40,240
Bonanza	do		5,241	18,772
Pegasus	Texas	5,588	5,215	31,889
Kettleman North Dome	California	5,451	5,166	412,808
Dollarhide	Texas	5,232	4,955	56,484
Anahuac	do	5,282	4,900	137,347
Cat Canyon, West	California	5,337	4,896	82,035
Cotton Valley	Louisiana	5,109	4,273	88,477
Talco	Texas	5,022	3,639	156,420

[1] The classification of fields and data may differ from other sources used in the State summaries.
[2] Includes revisions.
[3] Includes following pools consolidated in 1955: Alma, North; Alma, Northeast; Alma, Southwest; Ava; Ava, North; Ava, Northwest; Camp; Camp, Southeast; Fox-Graham; Milroy; Milroy, West; Sholem-Alechem; Sholem-Alechem, Northwest; Sholem-Alechem, Southwest; Sholem-Alechem, West; Tatumus; Velma; Wheeler.
[4] In addition to the Golden Trend pool, the following are included: Blue Hill; Bradley, East; Goldsby, Southwest; Iron Chapel; Lindsay, North; Lindsay, Northeast; Lindsay, West; Newcastle, East; Newcastle, Southeast.
[5] Includes Burbank, Burbank South, Little Chief, Northeast, and Little Chief, West, consolidated in 1955.
[6] Bureau of Mines data.

BY STATES

Additional data on crude production will be found in volume III of the Minerals Yearbook.

TABLE 12.—Production of crude petroleum in Arkansas, 1952–56, by fields

(Thousand barrels)

Field	1952	1953	1954	1955	1956 [1]
Atlanta	810	649	554	483	438
Bradley West					499
Buckner	722	645	529	478	444
Dorcheat-Macedonia	877	841	624	617	632
El Dorado	649	711	838	857	923
Fouke	1,053	1,429	1,210	1,241	1,431
Horsehead	29	194	706	816	403
Magnolia	4,223	4,029	3,289	2,890	3,609
McKamie	1,446	1,369	1,480	1,331	1,349
Midway	2,674	2,642	2,262	2,048	2,238
Shuler	2,377	2,318	2,599	2,593	2,353
Smackover	3,814	3,892	4,370	4,678	4,466
Stephens	1,308	1,223	1,077	1,014	1,157
Village	1,018	840	850	846	811
Wesson	3,510	3,296	2,699	1,840	1,591
Other fields [2]	4,930	5,603	6,043	6,637	6,801
Total Arkansas	29,440	29,681	29,130	28,369	29,145

[1] Preliminary figures.
[2] Includes oil consumed on leases and net change in stocks held on leases for entire State.

TABLE 13.—Production of crude petroleum in California, 1952–56, by districts and fields in thousand barrels

[American Petroleum Institute]

District and field	1952	1953	1954	1955	1956
San Joaquin Valley:					
Belridge	3,237	3,567	4,015	4,092	4,297
Buena Vista	9,753	8,881	7,962	7,713	7,767
Coalinga	30,344	28,356	27,575	29,661	29,280
Coles Levee	7,007	6,785	6,462	6,585	5,313
Cuyama-Russell Ranch	19,805	17,409	16,769	16,132	15,940
Edison	5,489	5,057	4,419	4,951	4,568
Elk Hill	2,836	5,960	7,696	6,689	5,959
Fruitvale	3,372	3,562	3,576	3,399	3,212
Gosford, East	802	652	488	425	443
Greeley	4,739	4,769	4,531	4,355	4,271
Helm	545	540	555	512	1,009
Kern River-Kern Bluff-Kern Front	7,790	7,500	5,610	5,921	7,437
Kettleman North Dome	7,984	6,657	6,041	5,447	5,345
Lost Hills	2,161	2,317	1,982	1,842	1,782
McKitterick	7,148	8,621	7,764	8,503	8,984
Midway-Sunset	12,309	12,512	13,362	14,707	15,070
Mountain View	1,303	1,372	1,356	1,554	1,447
Mount Poso	3,276	3,100	3,078	3,161	2,927
Poso Creek	1,405	1,767	1,323	1,285	1,517
Raisin City	1,790	1,854	1,944	1,916	2,137
Rio Bravo	4,335	4,415	4,313	4,563	3,995
Riverdale	789	677	611	529	544
Round Mountain	2,015	1,915	1,793	1,681	1,630
Tejon Group	2,363	2,366	2,418	3,915	3,360
Ten Section	1,621	1,472	1,438	1,650	1,638
Other San Joaquin Valley	8,005	9,006	9,615	9,037	11,932
Total San Joaquin Valley	152,223	151,089	146,696	150,225	151,804
Coastal district:					
Aliso Canyon	2,428	2,640	2,790	2,845	2,606
Cat Canyon	6,700	6,992	6,065	5,382	6,133
Del Valle	1,229	995	1,070	926	747
Elwood	1,785	1,569	1,436	1,291	1,205
Gato Ridge	1,076	1,012	973	947	966
Lompoc	1,917	1,697	1,493	1,247	1,047
Newall-Potrero	2,851	3,314	3,558	3,612	3,459
Orcutt	1,421	1,354	1,265	1,231	1,144
Padre Canyon [1]	1,549	1,726	1,736	1,577	1,346
Placerita	3,458	2,756	2,171	1,834	1,590
Romona	1,287	1,047	863	724	612

See footnotes at end of table.

TABLE 13.—Production of crude petroleum in California, 1952–56, by districts and fields in thousand barrels—Continued

District and field	1952	1953	1954	1955	1956
Coastal district—Continued					
Rincon	1,499	1,457	1,517	1,632	3,079
San Ardo	8,281	11,284	11,172	10,972	11,733
San Miguelita	4,250	3,134	1,990	1,835	1,648
San Maria	4,029	4,191	3,680	3,012	2,713
South Mountain	2,858	4,594	5,261	4,676	4,995
Ventura	27,241	29,901	31,129	25,603	24,357
Zaca Creek	1,537	1,653	1,709	1,317	953
Other Coastal	8,388	12,625	12,720	14,208	12,735
Total Coastal	83,784	93,941	92,598	84,871	83,068
Los Angeles Basin:					
Brea Olinda	6,928	8,574	8,314	7,498	6,864
Coyote	6,075	5,655	5,087	4,495	4,498
Dominquez	3,893	3,658	3,421	3,448	4,366
Huntington Beach	21,789	21,139	21,556	24,107	22,468
Inglewood	4,984	4,950	4,778	4,374	4,466
Long Beach	7,963	7,422	7,739	9,948	7,748
Montebello	1,916	1,767	1,575	1,559	1,518
Newport	1,494	1,546	1,555	1,671	1,546
Richfield	2,412	2,628	2,738	2,495	2,290
Rosecrans [2]	1,684	1,478	1,360	1,281	1,185
Sansinena	1,928	2,800	3,062	3,827	3,798
Santa Fe Springs	5,164	5,315	5,141	4,591	5,193
Seal Beach	4,083	3,852	3,545	3,634	3,946
Torrance	2,510	2,564	2,526	2,573	2,614
Wilmington	48,121	44,328	41,540	38,860	36,844
Other Los Angeles Basin	2,499	2,379	2,634	5,355	7,221
Total Los Angeles Basin	123,443	120,055	116,571	119,716	116,565
Total California	359,450	365,085	355,865	354,812	351,437

[1] Includes Oak Grove area.
[2] Includes Athens.

TABLE 14.—Production of crude petroleum in Colorado, 1952–56, by fields

(Thousand barrels)

Field [1]	1952	1953	1954	1955	1956 [2]
Adena	-	24	4,626	6,015	5,709
Badger Creek-West	-	455	1,033	747	518
Big Beaver	-	-	137	825	876
Black Hollow	-	56	500	783	676
Bobcat	-	-	496	1,200	884
Cliff	-	-	-	820	979
Divide	-	-	416	677	405
Graylin-South and Northwest	114	364	1,996	1,588	1,051
Lewis Creek	-	157	782	674	456
Little Beaver-East	50	2,539	2,687	2,089	1,993
Mt. Hope-East and North	578	1,125	892	1,024	840
Plum Bush Creek	-	-	2	665	1,232
Rangely	22,443	22,900	22,780	23,901	28,302
Sand River	-	-	187	560	483
Wilson Creek	2,851	2,854	2,640	2,440	2,556
Yenter	962	1,503	1,120	904	647
Other [3]	3,383	4,425	5,912	7,741	10,939
Total Colorado	30,381	36,402	46,206	52,653	58,546

[1] Figures by fields supplemented by data from Rocky Mountain Oil and Gas Operations for 1956.
[2] Preliminary figures.
[3] Includes crude oil consumed on leases and net change in stocks held on leases for entire State.

TABLE 15.—Production of crude petroleum in Illinois, 1952–56, by fields in thousand barrels

[Oil and Gas Journal]

Field	1952	1953	1954	1955	1956 [1]
Albion	1,134	1,162	1,088	1,232	1,120
Benton	3,056	2,441	1,740	1,462	1,032
Boyd	557	539	533	718	899
Bridgeport	1,996	2,531	2,747	3,417	4,352
Centralia	836	701	634	563	546
Clay City	6,993	8,065	9,526	10,300	9,210
Dale	2,249	2,053	1,808	1,912	3,543
East Inman	630	539	461	1,067	1,513
Johnsonville	678	588	588	839	1,063
Louden	5,587	5,249	6,486	7,535	9,828
New Harmony	3,215	3,491	4,736	4,440	4,022
Phillipstown	1,084	989	868	979	1,168
Robinson	1,572	2,045	2,377	2,606	2,621
Roland	554	489	1,093	2,045	2,503
Sailor Springs	1,204	1,192	1,473	1,544	1,794
Salem	3,080	2,541	4,981	7,673	6,606
Other fields	25,139	[1] 24,411	[1] 25,659	[1] 33,091	[1] 30,336
Total Illinois	59,564	59,026	[1] 66,798	[1] 81,423	[1] 82,156

[1] Bureau of Mines figures.

TABLE 16.—Production of crude petroleum in Kansas, 1952–56, by fields in thousand barrels

[Oil and Gas Journal]

Field	1952	1953	1954	1955	1956
Bemis-Shutts	3,741	3,526	3,549	3,263	3,076
Bloomer	2,344	2,067	1,589	1,456	1,268
Burnett-Southwest	2,709	[1] 2,303	2,170	2,464	2,230
Burrton-Haury	909	781	809	732	695
Chase	[2] 7,152	[2] 6,007	[2] 5,339	[2] 4,897	[2] 4,689
El Dorado	3,454	3,939	3,864	4,242	4,348
Fairport	879	834	823	903	964
Genesco-Edwards	3,304	3,061	2,869	2,941	2,734
Gladys	(3)	(3)	(3)	1,024	1,885
Gorham	1,990	1,793	1,692	1,589	1,543
Hall Gurney	3,954	4,640	4,528	4,064	3,587
Iuka-Carmi	1,244	1,314	1,421	1,464	1,486
Kraft-Prusa	5,449	4,721	4,357	3,826	3,498
Marcotte	1,964	1,831	1,681	1,712	1,621
Morel	2,092	1,798	1,654	1,470	1,461
Ray	1,624	1,393	1,280	1,312	1,225
Seeley-Wick	1,292	1,753	1,798	1,479	1,341
Silica-Raymond	(2)	(2)	(2)	(2)	(2)
Stoltenberg	1,471	1,270	1,119	1,043	951
Thrall-Agard	1,650	1,121	1,002	775	748
Trapp	6,469	6,081	5,461	4,943	4,427
Welch-Bornholdt	740	1,259	1,361	1,254	1,108
Other fields	60,414	[4] 63,767	[4] 70,951	[4] 74,816	[5] 78,948
Total Kansas	114,845	[4] 115,259	[4] 119,317	[4] 121,669	[5] 123,833

[1] Revised.
[2] Silica included with Chase.
[3] Included with "Other fields."
[4] Bureau of Mines figures.
[5] Preliminary figures.

TABLE 17.—Production of crude petroleum in Louisiana, 1952–56, by districts and fields

(Thousand barrels)

District and field	1952	1953	1954	1955	1956 [1]
Gulf Coast:					
Anse la Butte	2,373	2,165	1,699	1,719	1,890
Avery Island	3,090	3,111	2,724	3,499	3,303
Bateman Lake	-----	-----	-----	-----	1,718
Barataria	2,876	2,351	1,628	1,358	1,103
Bay de Chene	1,288	1,302	1,208	1,456	1,609
Bay Marchand	2,004	1,560	2,430	2,933	3,539
Bay St. Elaine	2,733	3,194	3,130	3,315	3,188
Bayou Blue	1,156	1,158	1,060	955	931
Bayou Choctaw	600	893	1,171	1,293	1,176
Bayou Mallett	1,604	1,796	1,413	1,140	1,043
Bayou Sale	5,199	4,710	3,589	3,090	2,825
Bully Camp	1,250	1,640	1,353	1,767	1,623
Caillou Island	7,136	8,540	8,398	9,017	9,626
Charenton	1,176	1,278	1,223	1,234	1,426
Cox Bay	2,102	2,700	3,413	3,113	2,762
Delta Farms	6,751	6,480	5,456	4,810	4,493
Dog Lake	1,276	1,530	1,270	1,072	947
Duck Lake	2,269	2,935	3,199	3,329	2,916
East White Lake	1,427	1,479	1,179	1,390	1,390
Egan	2,041	2,017	2,117	2,225	2,529
Erath	1,179	1,370	1,152	964	919
Garden Island	1,590	1,590	1,419	1,343	1,340
Gibson	1,498	1,410	1,140	1,020	919
Golden Meadows	4,546	3,918	3,974	3,784	3,452
Good Hope	2,288	2,045	1,446	1,208	1,087
Grand Bay	3,638	3,768	3,519	3,403	4,030
Gueydan	1,970	1,570	1,298	1,076	963
Hackberry	3,780	4,512	4,215	4,451	5,927
Horseshoe Bayou	1,303	1,394	1,097	871	836
Iberia	-----	-----	-----	-----	800
Iowa	2,513	2,842	2,701	2,465	2,214
Jeanerette	1,084	1,137	1,228	1,193	1,148
Jennings	-----	-----	-----	-----	1,024
Lafitte	4,467	4,650	3,686	3,323	2,935
Lake Arthur South	-----	-----	-----	-----	1,097
Lake Barre	417	599	1,056	1,363	1,723
Lake Chicot	1,104	1,072	1,021	1,031	1,009
Lake Fausse Point	468	576	823	1,344	1,499
Lake Pelto	2,456	2,697	2,324	2,421	2,652
Lake Salvador	1,843	1,831	1,415	1,370	1,391
Lake Washington	380	951	1,947	4,697	7,849
La Rose	-----	-----	-----	-----	1,095
Leeville	2,417	3,251	3,556	4,088	4,094
Little Lake	192	823	1,582	2,147	2,353
Lockport	-----	-----	-----	-----	908
Main Pass	2,445	4,287	4,981	6,354	8,417
North Crowley	1,390	1,504	1,273	1,299	1,168
Paradis	3,411	3,445	3,379	3,172	2,843
Phoenix Lake	1,507	1,781	1,778	1,533	1,367
Pine Prairie	984	955	864	885	927
Point-a-La Hache	2,746	2,689	2,451	2,168	1,999
Port Barre	1,285	1,327	1,056	925	852
Quarentine Bay	3,480	3,151	2,649	3,151	3,964
Romere Pass	3,641	4,570	4,719	3,913	3,485
St. Gabriel	2,095	1,778	1,278	1,047	825
Section 28	1,343	1,244	1,335	1,359	1,396
Shuteston	-----	-----	-----	-----	1,025
South Pass	-----	-----	-----	-----	8,208
Tepetate	2,647	2,149	1,722	1,692	1,706
Timbalier Bay	1,731	2,514	2,289	3,935	6,120
University	1,811	1,534	1,391	1,073	934
Valentine	902	1,252	1,379	1,684	1,802
Venice	5,965	5,728	5,364	4,903	5,117
Ville Platte	1,424	1,333	1,402	1,249	1,150
Vinton	3,786	3,618	2,712	2,352	2,203
Weeks Island	10,680	11,258	9,029	8,210	8,668
West Bay	3,123	3,132	2,525	2,423	3,326
West Cote Blanche	2,830	2,865	2,380	2,016	1,891
West Lake Verrett	1,966	1,757	1,517	1,332	1,361
White Castle	1,563	1,343	941	763	786
Other Gulf Coast [2]	49,780	56,071	58,048	77,694	76,607
Total Gulf Coast	200,019	214,130	204,721	227,409	251,448

See footnotes at end of table.

TABLE 17.—Production of crude petroleum in Louisiana, 1952–56, by districts and fields—Continued

(Thousand barrels)

District and fields	1952	1953	1954	1955	1956
Northern:					
Big Creek	1,432	1,279	900	750	679
Caddo	5,111	5,438	8,251	9,111	8,417
Cotton Valley					1,407
Delhi	6,436	5,916	4,880	5,377	6,301
Esperance Point					1,684
Haynesville	5,008	4,445	3,694	3,234	2,859
Lake St. John	4,870	4,015	3,162	2,788	2,430
Nebo [3]	2,272	2,268	2,270	2,193	1,905
Olla [4]	2,203	2,106	1,934	1,709	1,626
Rodessa	934	868	784	793	751
Sligo	859	879	966	1,030	1,043
Urania					786
Other Northern [2]	14,785	15,288	14,996	16,616	16,613
Total Northern	43,910	42,502	41,837	43,601	46,501
Total Louisiana	243,929	256,632	246,558	271,010	297,949

[1] Preliminary figures.
[2] Includes crude oil consumed on leases and net change in stocks held on leases for entire district.
[3] Includes Hemphill, Trout Creek, and Jena.
[4] Includes Little Creek and Summerville.

TABLE 18.—Production of crude petroleum in Michigan, 1952–56, by fields, in thousand barrels

[Michigan Department of Conservation]

Field	1952	1953	1954	1955	1956 [1]
Beaver Creek	510	421	342	298	291
Coldwater	1,388	1,253	1,160	1,052	923
Deep River	1,847	1,774	1,569	1,180	875
East Norwich	470	488	462	415	402
Kawkawlin	559	480	447	400	434
Kimball Lake	411	288	194	115	57
Pentwater	660	383	274	219	197
Reed City and East Reed City	594	495	482	477	443
Rose City	557	599	553	464	392
St. Helen	410	307	238	223	209
Stony Lake	733	659	561	420	347
Other fields	5,112	5,138	5,746	6,003	6,309
Total Michigan	13,251	12,285	12,028	11,266	10,879

[1] Preliminary figures.

TABLE 19.—Production of crude petroleum in Mississippi, 1952–56, by fields

(Thousand barrels)

Field	1952	1953	1954	1955	1956 [1]
Baxterville	6,212	5,940	5,137	5,301	5,874
Bolton					842
Brookhaven	3,905	4,211	3,724	3,511	3,019
Cranfield	2,792	2,398	1,776	1,497	1,299
Eucutta	1,670	1,542	1,352	1,355	1,484
Heidelburg	3,437	3,336	3,098	3,253	3,641
La Grange	3,277	2,701	2,269	2,128	2,137
Mallalieu	1,944	1,484	1,252	1,117	1,021
Soso	288	316	748	3,110	4,289
Tinsley	4,934	4,545	4,326	4,475	4,399
Yellow Creek	1,633	1,652	1,526	1,433	1,494
Other fields	6,218	7,495	9,032	10,561	11,073
Total Mississippi	36,310	35,620	34,240	37,741	40,572

[1] Preliminary figures.

TABLE 20.—Production of crude petroleum in Montana, 1952–56, by fields in thousand barrels

[Montana Oil Conservation Board]

Field	1952	1953	1954	1955	1956 [1]
Big Wall	316	191	258	300	255
Bowes	1,025	1,095	980	510	340
Cabin Creek	----------	(2)	235	631	1,633
Cat Creek	271	209	200	174	162
Cut Bank	2,633	2,673	2,575	2,694	2,684
Elk Basin	1,819	1,704	1,643	1,441	2,007
Glendive	(2)	601	718	621	678
Kevin-Sunburst	1,344	1,296	1,207	1,131	1,017
Pine	(2)	(2)	430	1,115	3,667
Ponders	697	753	549	491	684
Poplar	(2)	1,155	3,016	3,185	4,098
Reagan	227	269	234	224	220
Sumatra	(2)	380	733	1,540	1,459
Other fields [3]	1,274	1,594	1,417	1,597	2,719
Total Montana	9,606	11,920	14,195	15,654	21,623

[1] Preliminary figures.
[2] Included in "Other fields."
[3] Includes crude oil consumed on leases and net change in stocks held on leases for entire State.

TABLE 21.—Production of crude petroleum in New Mexico, 1952–56, by districts and fields in thousand barrels

[Oil and Gas Journal]

District and field	1952	1953	1954	1955	1956
Southeast:					
Bagley	2,447	2,033	1,867	1,659	1,614
Brunson	3,511	3,007	2,264	1,691	1,193
Caprock-East	(1)	1,886	2,135	2,243	6,942
Crossroad	939	939	1,355	1,193	1,358
Denton	4,329	8,668	10,651	11,031	10,778
Dollarhide-West	753	1,978	3,251	3,164	3,027
Drinkard	4,007	3,454	2,828	2,482	2,054
Eunice-Monument	9,588	9,321	9,029	10,544	10,527
Fowler	(1)	(1)	837	1,362	847
Gladiola	780	1,304	1,571	1,293	1,605
Grayburg-Jackson	1,353	1,162	1,114	1,054	945
Hare	2,027	2,047	1,642	1,290	973
Hobbs	3,902	3,663	3,340	3,397	3,401
Langlie-Mattix	1,635	1,669	1,402	1,641	2,046
Lovington-East	1,136	2,472	3,250	3,316	3,080
Maljamar	1,813	1,792	1,790	1,878	2,277
Moore	(1)	921	1,166	1,228	1,235
Saunders-South	1,571	2,164	2,200	1,903	1,727
Vacuum	4,496	4,281	3,832	3,804	3,944
Warren	(1)	1,438	1,469	1,508	1,473
Other fields	13,872	[2] 15,466	[2] 17,112	[2] 24,260	[2] 25,433
Northwest [2]	566	776	715	1,017	1,414
Total New Mexico	58,725	[2] 70,441	[2] 74,820	[2] 82,958	[2 3] 87,893

[1] Included in "Other fields."
[2] Bureau of Mines figures.
[3] Preliminary figures.

TABLE 22.—Production of crude petroleum in Oklahoma, 1952–56, by fields in thousand barrels

[Oil and Gas Journal]

Field	1952	1953	1954	1955	1956
Allen	1,336	1,456	1,709	1,733	1,638
Bebee	1,244	1,087	926	836	745
Burbank	3,157	3,476	[1] 3,466	[2] 10,139	[2] 13,519
Cache Creek	1,042	956	787	707	661
Camp	975	1,606	1,329	(3)	(3)
Cement	3,964	4,070	3,517	4,186	4,372
Cumberland	3,102	2,562	1,690	1,841	1,944
Cushing	2,889	3,385	3,176	2,823	2,549
Dilworth	(4)	(4)	1,279	1,135	921
Doyle	2,475	3,934	2,976	2,683	3,056
Elk City	7,248	6,380	5,348	6,277	5,326
Eola	1,178	1,651	1,424	[5] 2,193	[5] 3,566
Fox-Graham	5,532	5,920	4,559	(3)	(3)
Glenn	2,252	2,145	2,045	1,983	1,901
Healdton	2,183	2,288	2,171	2,307	2,347
Hewitt	3,173	2,703	[6] 3,339	[6] 3,411	[6] 3,495
Holdenville-East	(4)	(4)	1,149	[7] 1,476	[7] 1,117
Hoover-Northwest	693	601	[8] 1,189	[9] 1,662	[9] 2,063
Knox	1,627	1,595	1,165	1,143	1,291
Milroy	1,091	2,325	1,755	(4)	(4)
Oklahoma City	5,513	5,187	4,148	3,803	3,743
Olympic	2,013	4,064	4,083	2,662	1,752
Payson-East	(4)	1,725	1,076	[10] 918	[10] 786
Ringwood	1,338	855	727	551	484
Seminole:					
Bowlegs	1,003	1,121	872	718	685
Little River	852	826	756	699	571
St. Louis	1,440	1,507	1,464	1,672	1,486
Seminole	1,077	1,211	998	921	827
Sholem-Alechem	12,239	12,736	10,261	(3)	(3)
Sho-Vel-Tum	----	----	----	30,316	29,717
South Burbank	617	894	1,429	(2)	(2)
Tatums	3,466	3,892	3,321	(3)	(3)
Velma-West	18,999	16,064	8,435	(3)	(3)
West Edmonds	4,471	1,887	[11] 1,821	1,733	1,945
Witcher	1,120	660	541	439	378
Yale-Quay	1,891	2,171	1,915	1,479	1,322
Other fields	90,323	[12] 99,630	[12] 99,005	[12] 110,371	[12] 120,809
Total Oklahoma	191,523	[12] 202,570	[12] 185,851	[12] 202,817	[12] 215,016

[1] Includes Burbank South and Fairfax.
[2] Includes Burbank, Burbank South, Little Chief Northeast, and Little Chief West consolidated in 1955.
[3] Included in Sho-Vel-Tum. The following pools were consolidated in 1955: Alma, North; Alma, Northeast; Alma, Southwest; Ava; Ava, North; Ava, Northwest; Camp; Camp, Southeast; Fox-Graham; Milroy; Milroy, West; Sholem-Alechem; Sholem-Alechem, Northwest; Sholem-Alechem, Southwest; Sholem-Alechem, West; Tatums; Velma; and Wheeler.
[4] Included in "Other fields."
[5] Includes Eola, North, and Eola, Northwest; consolidated in 1955.
[6] Includes Brockwest and Lone Grove, Southwest.
[7] Includes Grief Creek.
[8] Includes Hoover, North; Brady, Southeast; and Roady, Northeast.
[9] Includes Holdenville, East, and Holdenville, West; consolidated in 1955.
[10] Includes Payson; consolidated in 1955.
[11] Includes Edmonds, Northwest, and Lockridge, Northeast.
[12] Bureau of Mines figures.

TABLE 23.—Production of crude petroleum in Texas, 1952–56, by districts and fields

(Thousand barrels)

District and field [1]	1952	1953	1954	1955	1956 [2]
Gulf Coast:					
Amelia	1,004	1,282	1,161	1,122	1,091
Anahuac	7,032	6,453	5,240	5,279	5,165
Barbers Hill	2,132	1,862	1,805	1,959	1,865
Beaumont-West	986	1,148	1,035	954	900
Bloomington	1,756	1,535	1,341	1,332	1,276
Boling	1,524	1,959	1,763	1,698	1,616
Chocolate Bayou	5,028	4,531	4,952	4,605	4,118
Conroe	12,813	11,937	10,081	10,376	10,455
Damon Mound	369	605	1,153	1,098	907
Dickinson-Gillock	4,105	4,235	4,030	3,987	3,956
Dyersdale	1,340	1,183	975	841	688
Esperson	1,474	1,365	1,284	1,154	1,023
Fairbanks	1,383	1,585	1,426	1,427	1,254
Falls City	1,232	1,059	898	904	854
Fannette	1,780	1,760	1,380	1,252	1,185
Francitas	656	962	1,172	1,556	1,540
Friendswood	13,729	12,398	10,378	10,620	10,515
Gohlke, Helen	2,180	2,512	2,478	2,305	2,081
Goose Creek	3,148	2,692	2,715	3,007	2,813
Greta	3,269	2,871	2,370	2,398	2,371
Hankamer	1,136	1,072	1,110	1,253	1,118
Hastings	14,767	13,644	11,570	11,649	11,396
Heyser	1,491	1,361	1,064	1,087	1,001
High Island	2,291	2,605	2,819	3,143	3,476
Houston-North-South	1,255	1,286	1,377	1,341	1,285
Hull	3,388	2,660	4,411	4,040	3,909
Humble	1,036	958	1,067	1,185	1,057
Liberty, South	1,626	2,011	2,348	2,677	3,324
Livingston	1,208	1,154	1,086	1,152	1,059
Lolita	1,589	1,476	1,247	1,358	1,459
Lovells Lake	1,217	978	863	860	870
McFaddin	1,368	1,275	1,076	1,316	1,314
Manvel	2,166	2,058	1,735	1,709	1,649
Markham	1,585	1,691	1,548	1,422	1,598
Old Ocean	6,268	5,954	4,994	5,378	5,287
Oyster Bayou	3,368	3,219	3,104	3,080	2,968
Pierce Junction	1,591	1,349	1,036	1,213	5,395
Placedo	1,997	2,210	1,951	1,832	1,716
Port Neches	1,847	1,846	1,687	1,491	1,260
Raccoon Bend	1,966	2,225	2,068	2,082	2,084
Refugio-Fox	2,655	2,419	2,330	2,422	2,190
Saratoga	758	675	1,417	1,968	1,112
Silsbee	1,465	1,398	1,248	1,340	1,284
Sour Lake	1,804	1,576	1,451	1,459	1,408
Stowell	2,360	1,936	1,645	1,709	1,738
Sugarland	1,294	1,193	933	959	932
Sugar Valley	1,468	1,364	1,143	1,135	1,101
Thompson	11,846	10,563	9,099	8,944	8,990
Tomball	2,204	2,095	1,888	2,188	2,242
Village Mills	3,216	3,494	2,871	2,519	2,511
West Columbia	2,297	2,252	2,344	2,436	2,365
West Ranch	6,844	6,652	5,427	5,606	6,314
Withers-Magnet	4,018	3,933	3,467	3,273	3,241
Other Gulf Coast [3 4]	69,268	73,120	62,098	78,202	82,376
Total Gulf Coast	231,597	227,636	203,159	221,302	226,692
East Texas:					
East Texas Proper	96,526	90,743	81,364	80,279	77,777
Cuyuga	1,373	1,258	1,082	1,078	1,088
Ham Gossett	1,040	1,186	1,099	1,067	871
Hawkins	16,261	18,417	16,589	16,865	16,304
Long Lake	1,476	1,236	959	988	1,161
New Hope	2,309	2,191	2,481	2,510	2,172
Pewitt Ranch	1,637	1,444	1,209	1,117	1,073
Pickton	1,383	1,788	1,477	1,453	1,429
Quitman	2,848	2,941	2,230	2,190	2,176
Talco	6,440	5,876	4,928	4,994	4,896
Van	11,349	10,650	8,850	8,816	8,703
Waskom	1,131	1,398	1,049	1,118	1,191
Woodlawn	91	411	1,045	919	652
Other East Texas	15,573	13,359	14,321	22,256	21,954
Total East Texas	159,437	152,898	138,683	145,650	141,447

See footnotes at end of table.

TABLE 23.—Production of crude petroleum in Texas, 1952–56, by districts and fields—Continued

(Thousand barrels)

District and field [1]	1952	1953	1954	1955	1956 [2]
Central Texas:					
Big Foot	793	1,792	2,413	2,455	2,148
Charlotte	1,778	1,536	1,760	2,152	2,960
Darst Creek	2,943	3,210	3,442	3,487	3,415
Luling	2,385	2,410	2,433	2,555	2,699
Other Central Texas	4,148	4,733	5,110	7,648	9,225
Total Central Texas	12,047	13,681	15,158	18,297	20,447
South Texas:					
Aqua Dulce	1,945	1,736	1,500	1,389	1,428
Flour Bluff	1,066	1,200	1,286	900	829
Fulton Beach	1,945	2,718	2,985	2,701	2,579
Garcia	1,294	1,223	1,057	1,008	931
Hoffman	1,983	1,841	1,500	1,500	1,385
Kelsey	3,059	2,243	3,173	3,609	3,833
London Gin	1,192	1,106	955	1,101	1,238
Midway	1,298	982	928	1,070	1,090
Mustang Island	2,154	2,878	2,697	2,768	2,566
Plymouth	5,167	6,915	6,613	6,740	6,043
Portilla	(3)	4,373	3,506	3,719	3,144
Saxet-Saxet Frio	980	998	830	757	1,173
Stratton	3,344	2,990	2,403	2,401	2,345
Sun	1,405	1,618	1,752	1,360	1,843
Taft	1,477	1,491	1,580	1,353	1,251
White Point	3,312	3,319	2,973	3,260	3,444
Willamer-West	3,152	2,920	2,434	2,480	2,442
Other South Texas	60,200	54,107	50,111	52,130	53,738
Total South Texas	94,973	94,658	88,283	90,246	91,302
North Texas [5,6]	96,513	111,269	114,979	129,701	138,696
Panhandle [7]	29,272	28,080	30,903	33,400	36,682
West Texas, by fields [1]	(8)	(8)	(8)	(8)	------
Abell	1,264	1,439	1,227	1,497	1,520
Adair	2,676	2,915	2,390	2,487	2,392
Andector	6,667	6,691	5,580	5,692	5,510
Anton Irish-Anton	2,743	2,914	2,586	2,930	2,933
Benedum	4,046	3,444	2,853	2,645	2,225
Big Lake	984	1,018	1,014	921	801
Block 31	3,489	5,204	5,182	5,191	5,727
Bronte	(9)	(9)	906	1,107	932
Cedar Lake	1,810	1,702	1,544	1,614	1,464
Cogdell	8,118	8,171	6,558	6,507	6,848
Cowden	9,844	9,219	8,595	10,009	10,769
Cree-Sykes	2,456	2,303	1,429	1,230	1,079
Diamond M	13,398	10,592	8,920	9,300	9,381
Dollarhide	7,311	8,259	6,728	5,944	4,959
Elkhorn	837	1,579	1,739	1,216	900
Embar	1,062	1,080	1,002	1,259	1,704
Emma	(9)	(9)	(9)	2,118	3,259
Fort Chadborne	419	5,183	5,275	4,516	3,802
Fort Stockton	823	1,237	1,325	1,294	1,525
Foster	4,758	4,326	3,714	4,616	4,816
Fuhrman	1,451	1,497	1,671	2,655	3,662
Fullerton	8,748	7,862	6,513	6,973	6,495
Garza	3,186	3,125	2,899	2,628	2,815
Goldsmith	18,699	18,663	14,577	16,212	18,385
Good	1,812	1,637	1,290	1,448	1,383
Harper	(9)	(9)	(9)	1,477	2,217
Hendrick	1,161	1,225	1,409	1,307	1,263
Howard-Glasscock	5,618	6,657	7,488	7,364	6,905
Hulldale-Hulldale Penn	1,392	1,903	1,528	1,824	2,104
Jameson	3,506	4,425	5,445	7,694	6,905
Jordan	4,228	4,131	3,620	3,481	3,316
Kelly Snyder	27,004	25,549	17,035	22,308	25,339
Kermit	(9)	(9)	1,972	2,834	3,704
Keystone	11,220	10,990	13,210	8,848	7,801
Lea	(9)	(9)	(9)	1,363	1,506
Levelland	11,783	11,410	9,992	9,504	8,714
Luther	(9)	(9)	(9)	1,136	1,246
McCamey	3,079	2,825	2,497	2,003	1,730
McElroy	7,431	7,250	6,718	6,829	9,562
McFarland	(9)	(9)	(9)	(9)	2,050
Mabee	771	824	944	1,016	1,024

See footnotes at end of table.

TABLE 23.—Production of crude petroleum in Texas, 1952–56, by districts and fields—Continued

(Thousand barrels)

District and field [1]	1952	1953	1954	1955	1956 [2]
Magutex	(9)	(9)	974	1,997	2,232
Martin	2,888	2,643	2,026	2,052	2,199
Means	1,626	1,523	1,336	2,996	6,421
Midland Farms	7,467	6,843	4,953	6,997	7,638
Pegasus	4,365	5,706	5,778	5,481	5,165
Penwell	793	978	1,426	1,612	1,719
Prentice	(9)	(9)	4,187	5,529	5,753
Reinecke	2,923	2,748	1,642	1,572	1,525
Robertson	(9)	(9)	(9)	(9)	1,344
Russell	(9)	(9)	3,474	5,541	7,200
Salt Creek	2,688	3,309	3,371	4,180	4,039
Sand Hills	4,099	4,065	4,000	5,074	6,800
Seminole	5,610	6,673	5,459	5,547	5,584
Shafer Lake	2,814	3,044	3,343	3,799	3,444
Sharon Ridge	1,324	1,174	1,253	1,348	1,590
Slaughter	13,669	13,591	11,370	11,151	11,010
Spraberry Trend	30,040	17,015	39,968	22,155	24,010
Three Bar	1,499	1,577	2,201	1,214	1,189
Todd	3,329	2,997	2,492	2,502	2,435
Triple N	(9)	(9)	1,046	1,254	1,492
TXL	12,075	10,476	8,277	6,146	5,602
University	(9)	(9)	[10] 2,615	2,163	3,704
Vealmoor-East	5,015	5,008	3,603	3,440	3,248
Waddell	1,113	1,912	1,151	1,349	1,572
Ward-Estes	10,397	8,921	7,433	8,713	9,964
Wasson	19,941	19,160	15,422	15,752	15,617
Welch	(9)	1,074	1,032	1,392	1,835
Wellman	1,862	2,077	966	1,163	1,057
Westbrook	(9)	(9)	(9)	(9)	1,209
Wilshire	3,832	4,620	3,384	2,953	2,174
World	1,561	1,519	1,376	1,441	1,903
Yarbrough	2,455	2,569	2,023	2,202	2,141
Yates	12,883	12,271	9,903	9,878	9,681
Other West Texas	58,148	60,200	58,251	85,111	102,738
Total West Texas	398,300	390,942	383,110	414,701	455,906
Total Texas	1,022,139	1,019,164	974,275	1,053,297	1,111,172

[1] Texas Railroad Commission districts.
[2] Preliminary figures.
[3] A new field was created out of a portion of Hull and included in "Other Gulf Coast."
[4] Includes crude oil consumed on leases for entire district.
[5] Includes the fields in and between Hardeman, Wilbarger, Wichita, Clay, Montague, and Cook counties on the north and San Saba, Lampasas, and Coryell on the south.
[6] Includes crude oil consumed on leases and net change in stocks held on leases for East (exclusive of East Texas proper) Central, North, and South Texas.
[7] Carson, Gray, Hutchinson, Moore, Sherman, and Wheeler Counties.
[8] From Oil and Gas Journal.
[9] Not available.
[10] University Block 9 and University-Waddell.

TABLE 24.—Production of crude petroleum in Wyoming, 1952–56, by fields

(Thousand barrels)

Field	1952	1953	1954	1955	1956 [1]
Beaver Creek	679	605	726	1, 130	2, 436
Big Muddy	1, 197	1, 373	1, 088	1, 232	2, 120
Big Sand Draw	2, 387	2, 400	2, 503	2, 546	2, 543
Bonanza	1, 620	2, 935	3, 536	5, 033	5, 581
Byron-Garland	4, 343	5, 603	6, 642	7, 599	7, 916
Cole Creek-Northeast and South	1, 820	2, 271	1, 506	1, 223	1, 094
Elk Basin	8, 041	8, 488	6, 889	7, 543	11, 200
Frannie	3, 709	3, 731	3, 708	3, 523	3, 055
Gebo	288	888	698	1, 469	1, 342
Glenrock-South	2, 414	4, 197	3, 940	3, 660	3, 488
Grass Creek	2, 395	3, 583	4, 367	4, 155	4, 308
Hamilton Dome	3, 075	3, 558	3, 766	4, 681	5, 106
Lance Creek	1, 895	1, 662	1, 937	1, 484	1, 489
Little Buffalo	951	1, 142	1, 224	1, 228	1, 187
Lost Soldier-Wertz, etc	5, 299	5, 900	6, 519	6, 449	6, 506
Oregon Basin	2, 688	3, 508	4, 698	5, 888	5, 817
Salt Creek	4, 159	4, 375	4, 583	4, 423	5, 085
Steamboat Butte	2, 056	3, 611	3, 443	3, 470	3, 419
Sussex-Meadow	2, 960	4, 022	6, 802	7, 392	7, 602
Winkleman	811	1, 255	1, 414	1, 349	1, 777
Other fields [2]	15, 287	17, 511	23, 344	24, 006	21, 412
Total Wyoming	68, 074	82, 618	93, 333	99, 483	104, 483

[1] Preliminary figures.
[2] Includes crude oil consumed on leases and net change in stocks held on leases for entire State.

WELLS

The number of wells drilled in the United States, including oil and gas wells and dry holes, set a new record of 57,111 in 1956—an increase of 1,189 wells over 1955. The percentage of dry holes drilled in proportion to the total increased from 37.1 percent in 1955 to 38.2 percent in 1956.

The daily average per producing well was 13.3 barrels in 1956 compared with 13.2 in 1955.

TABLE 25.—Wells drilled for oil and gas in United States, 1955–56, by months

[Oil and Gas Journal]

Wells	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total: Number	Total: Percent
1955														
Oil	2, 486	2, 340	2, 738	2, 787	2, 594	2, 798	2, 661	2, 834	2, 746	2, 473	2, 598	2, 512	31, 567	56. 4
Gas	261	227	264	280	305	306	317	340	326	321	337	329	3, 613	6. 5
Dry	1, 545	1, 434	1, 609	1, 763	1, 660	1, 886	1, 654	1, 923	1, 934	1, 792	1, 763	1, 779	20, 742	37. 1
Total	4, 292	4, 001	4, 611	4, 830	4, 559	4, 990	4, 632	5, 097	5, 006	4, 586	4, 698	4, 620	55, 922	100. 0
1956														
Oil	2, 643	2, 533	2, 502	2, 646	2, 977	2, 574	2, 680	2, 995	2, 245	2, 611	2, 417	2, 335	31, 158	54. 6
Gas	345	281	287	309	362	327	352	420	340	446	316	330	4, 115	7. 2
Dry	1, 912	1, 719	1, 485	1, 686	1, 900	1, 862	1, 858	2, 162	1, 723	1, 940	1, 790	1, 801	21, 838	38. 2
Total	4, 900	4, 533	4, 274	4, 641	5, 239	4, 763	4, 890	5, 577	4, 308	4, 997	4, 523	4, 466	57, 111	100. 0

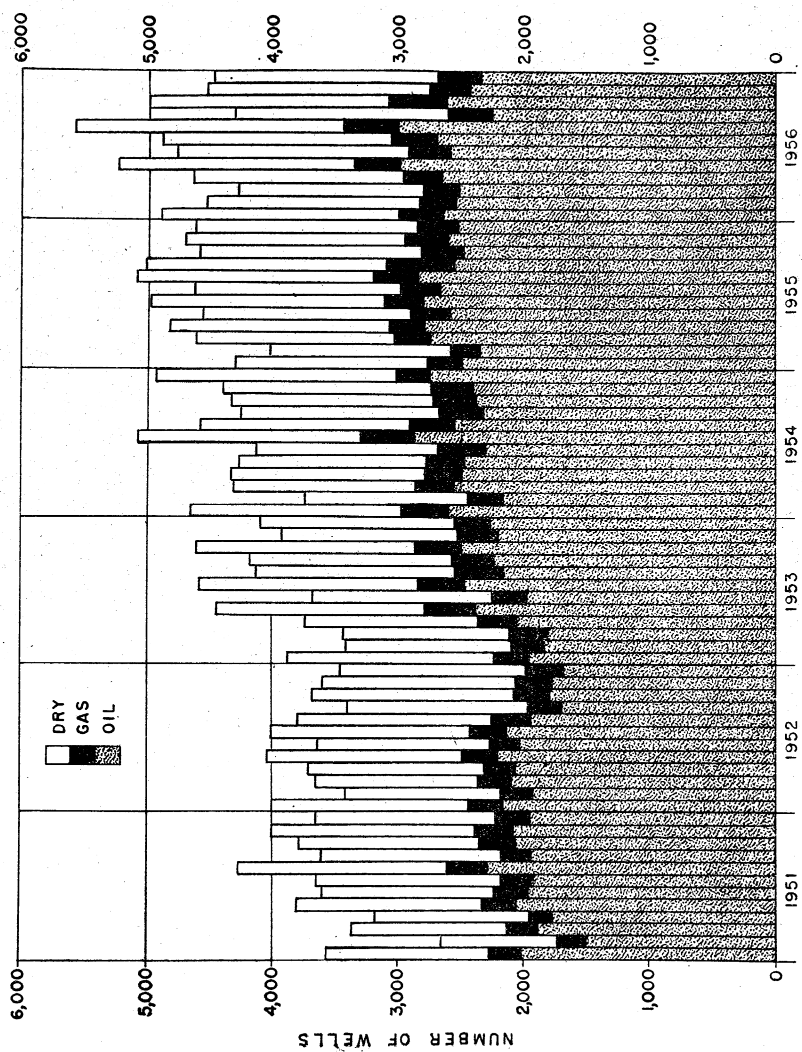

Figure 4.—Wells drilled in the United States, 1951–56, by months.

TABLE 26.—Wells drilled for oil and gas in the United States, 1955–56, by States and districts

[Oil and Gas Journal]

State and district	1955				1956			
	Oil	Gas	Dry	Total	Oil	Gas	Dry	Total
Alabama	1		40	41	56	1	34	91
Arkansas	429	10	364	803	657	13	332	1,002
California	1,747	64	644	2,455	1,680	51	573	2,304
Colorado	402	84	1,023	1,509	251	107	864	1,222
Illinois	2,100	16	1,773	3,889	1,674	63	2,066	3,803
Indiana	205	22	477	704	288	7	439	734
Kansas	2,434	362	2,149	4,945	2,240	381	2,242	4,863
Kentucky	655	162	773	1,590	795	165	971	1,931
Louisiana:								
Gulf Coast	1,139	126	678	1,943	1,097	240	833	2,170
Northern	1,417	156	498	2,071	985	161	556	1,702
Total Louisiana	2,556	282	1,176	4,014	2,082	401	1,389	3,872
Michigan	194	19	298	511	202	12	223	437
Mississippi	180	1	267	448	145	5	291	441
Montana	170	16	225	411	234	7	253	494
Nebraska	307	4	580	891	301	1	616	918
New Mexico	859	564	240	1,663	861	674	369	1,904
Oklahoma	5,131	359	2,588	8,078	4,825	321	2,476	7,622
Pennsylvania, New York, Ohio, West Virginia	1,098	986	558	2,642	1,127	934	523	2,584
Texas:								
Gulf Coast	1,239	159	1,105	2,503	1,219	285	1,118	2,622
West Texas	3,912	37	954	4,903	4,725	43	939	5,707
East Texas	410	95	479	984	485	82	564	1,131
Other districts	6,915	312	4,353	11,580	6,653	484	4,863	12,000
Total Texas	12,476	603	6,891	19,970	13,082	894	7,484	21,460
Wyoming	439	46	430	915	448	52	430	930
Other States	184	13	246	443	210	26	263	499
Total United States	31,567	3,613	20,742	55,922	31,158	4,115	21,838	57,111

CONSUMPTION AND DISTRIBUTION

The total demand for crude oil in the United States in 1956 was 7.1 percent above the previous high of 1955. The demand for domestic crude oil increased 5.6 percent and for foreign crude, 20.5 percent.

Foreign crude oil supplied 11.6 percent of the total demand in 1956, compared with 10.3 percent in 1955.

Exports of crude oil in 1956 were 14.6 percent higher than in 1955. This increase was confined to the last 2 months of 1956, when the United States was shipping large quantities of crude oil to Europe to relieve the oil shortage created by closing of the Suez Canal.

Runs to Stills.—Total crude runs to stills averaged 7,937,000 barrels daily in 1956 and were 457,000 barrels daily—6.1 percent above the 1955 total.

Distribution.—The Bureau of Mines collects data relating to receipts of domestic and foreign crude petroleum at United States refineries. These receipts include the crude runs to stills, a small amount used as refinery fuel, and any increase in crude stocks at refineries. Classification of receipts, by States of origin, shows the amounts received from local production (intrastate), from other States

TABLE 27.—Producing oil wells in the United States and average production per day, 1955–56, by States and districts

State and district	Producing oil wells			
	1955		1956 [1]	
	Approximate number Dec. 31	Average production per well per day (barrels)	Approximate number Dec. 31	Average production per well per day (barrels)
Arkansas	4,610	17.2	5,225	16.2
California	34,760	28.8	35,990	27.1
Colorado	1,940	78.2	2,150	78.2
Illinois	29,600	7.5	31,400	7.4
Indiana	4,080	7.3	4,405	7.4
Kansas	36,177	9.0	37,570	9.2
Kentucky	17,800	2.5	18,660	2.6
Louisiana:				
Gulf Coast	8,600	78.2	9,175	77.3
Northern	10,200	12.7	11,730	12.0
Total Louisiana	18,800	42.7	20,905	41.0
Michigan	4,034	7.5	4,191	7.2
Mississippi	2,339	45.8	2,374	47.0
Montana	3,414	12.6	3,584	16.9
Nebraska	790	45.8	825	54.8
New Mexico	8,640	27.7	9,415	26.6
New York	20,100	.4	19,670	.4
North Dakota	570	59.3	789	54.2
Ohio	14,195	.8	14,385	.9
Oklahoma	69,930	8.2	70,075	8.4
Pennsylvania	72,525	.3	71,080	.3
Texas: [2]				
Gulf Coast	20,070	30.6	20,770	30.3
West Texas	47,450	24.6	56,350	24.0
East Texas proper	20,660	10.6	20,925	10.2
Other districts	71,700	13.2	80,050	12.6
Total Texas	159,880	18.4	178,095	18.0
West Virginia	12,500	.5	12,770	.5
Wyoming	6,960	49.4	7,190	40.3
Other States [3]	366	32.4	422	41.3
Total United States	524,010	13.2	551,170	13.3

[1] Preliminary figures.
[2] Texas Railroad Commission divisions.
[3] Alabama, Florida, Missouri, Nevada, South Dakota, Tennessee, Utah, and Virginia.

(interstate), and receipts of imported crude. Classification by method of transportation indicates the final receipts by water, pipeline, and tank car and truck. Receipts of domestic crude by water were usually moved by pipeline from the point of production to the point of water shipment.

Receipts of domestic and foreign crude petroleum at refineries totaled 2,912.1 million barrels in 1956; these refineries processed 2,905.1 million barrels, increased stocks by 4.8 million barrels, and accounted for 2.2 million as fuel or losses. Receipts of foreign crude oil represented 11.7 percent of the total. Refiners in the East Coast district received 71.5 percent of the foreign crude imported in 1956, the West Coast district 19.2 percent, the Great Lakes area 5.8 percent, and the Gulf Coast area 3.5 percent.

TABLE 28.—Runs to stills of crude petroleum in the United States in 1956, by district and month [1]

(Thousand barrels)

District [2]	January	February	March	April	May	June	July	August	September	October	November	December	Total
East Coast:													
Domestic	15,472	14,614	15,246	12,923	11,474	13,004	12,304	12,983	11,583	14,339	15,051	18,381	167,374
Foreign	19,616	17,744	20,325	17,896	20,854	21,458	23,792	22,368	21,563	21,174	19,185	18,824	244,799
Total East Coast	35,088	32,358	35,571	30,819	32,328	34,462	36,096	35,351	33,146	35,513	34,236	37,205	412,173
Appalachian	6,488	5,987	6,074	5,834	6,158	6,115	6,419	6,355	6,104	6,005	6.184	6,540	74,263
Indiana, Illinois, Kentucky, etc.:													
Domestic	46,258	41,246	43,051	39,716	41,824	40,292	42,192	43,106	43,145	41,772	42,602	45,660	510,864
Foreign	----------	40	149	268	304	470	422	505	398	467	259	260	3,542
Total Indiana, Illinois, Kentucky, etc	46,258	41,286	43,200	39,984	42,128	40,762	42,614	43,611	43,543	42,239	42,861	45,920	514,406
Minnesota, Wisconsin, North Dakota, and South Dakota:													
Domestic	1,219	1,209	1,214	800	1,229	1,345	1,483	1,428	1,499	1,007	1,469	1,387	15,289
Foreign	1,484	1,447	1,341	1,605	1,222	1,459	1,384	758	1,240	1,095	1,523	1,606	16,164
Total Minnesota, Wisconsin, North Dakota, and South Dakota	2,703	2,656	2,555	2,405	2,451	2,804	2,867	2,186	2,739	2,102	2,992	2,993	31,453
Oklahoma, Kansas, etc	21,936	20,748	20,641	18,121	21,841	21,526	22,460	21,782	20,118	19,259	20,832	21,514	250,778
Texas Inland	8,629	7,969	8,358	7,378	8,697	8,393	8,450	8,494	8,454	7,924	8,007	8,666	99,419
Texas Gulf Coast:													
Domestic	58,592	57,730	60,555	58,088	61,613	60,085	58,499	59,653	57,479	55,693	57,727	60,126	705,840
Foreign	560	998	909	657	977	1,112	840	1,290	853	1,028	1,060	293	10,577
Total Texas Gulf Coast	59,152	58,728	61,464	58,745	62,590	61,197	59,339	60,943	58,332	56,721	58,787	60,419	716,417
Louisiana Gulf Coast:													
Domestic	21,464	19,949	22,066	20,191	21,901	22,075	21,961	21,989	20,877	20,044	19,888	21,023	253,428
Foreign	127	118	46	146	114	130	137	140	83	94	116	21	1,272
Total Louisiana Gulf Coast	21,591	20,067	22,112	20,337	22,015	22,205	22,098	22,129	20,960	20,138	20,004	21,044	254,700
Arkansas, Louisiana Inland, etc	2,919	2,744	2,198	1,805	2,997	2,974	3,185	3,184	3,100	2,856	3,091	3,192	34,245
New Mexico	680	599	646	710	684	680	781	797	731	800	812	822	8,742
Rocky Mountain:													
Domestic	8,352	8,048	8,137	6,798	8,359	8,574	8,707	8,722	8,055	8,099	8,017	8,258	98,126
Foreign	----------	8	1	2	9	4	4	7	8	7	11	9	70
Total Rocky Mountain	8,352	8,056	8,138	6,800	8,368	8,578	8,711	8,729	8,063	8,106	8,028	8,267	98,196

See footnotes at end of table.

TABLE 28.—Runs to stills of crude petroleum in the United States in 1956, by district and month [1]—Continued

(Thousand barrels)

District [2]	January	February	March	April	May	June	July	August	September	October	November	December	Total
West Coast:													
Domestic	30,285	27,791	29,338	27,767	29,888	27,845	30,131	27,648	29,031	27,395	28,768	29,400	345,287
Foreign	4,640	4,385	5,045	3,918	4,639	4,578	5,288	6,642	6,387	6,784	6,342	6,379	65,027
Total California	34,925	32,176	34,383	31,685	34,527	32,423	35,419	34,290	35,418	34,179	35,110	35,779	410,314
Total United States:													
Domestic	222,294	208,634	217,524	200,131	216,665	212,908	216,572	216,141	210,176	205,193	212,448	224,969	2,563,655
Foreign	26,427	24,740	27,816	24,492	28,119	29,211	31,867	31,710	30,532	30,649	28,496	27,392	341,451
Grand total, 1956	248,721	233,374	245,340	224,623	244,784	242,119	248,439	247,851	240,708	235,842	240,944	252,361	2,905,106
1955	228,737	211,365	228,594	214,080	225,699	224,510	234,986	234,966	224,478	231,411	230,758	240,634	2,730,218
Daily average, 1956	8,023	8,047	7,914	7,487	7,896	8,071	8,014	7,995	8,024	7,608	8,031	8,141	7,937

[1] Preliminary figures.
[2] Where no breakdown is shown, all runs were of domestic crude.

Refinery receipts of crude oil in 1956, by methods of transportation, indicated that 75.1 percent was delivered by pipeline, 23.7 by tanker and barge, and 1.2 percent by tank car and truck. Tank-car and truck movements are primarily local.

The major interstate waterborne shipments were from the Gulf coast to the east coast and between States in the Gulf Coast district. Intrastate shipments of crude by water occurred in California, Louisiana, Mississippi, Texas, and Kentucky.

TABLE 29.—Receipts of domestic and foreign crude petroleum at refineries in the United States, 1952–56

(Millions barrels)

Method of transportation	1952	1953	1954	1955	1956 [1]
By water:					
Intrastate	170.0	173.1	161.0	155.4	166.4
Interstate	243.1	231.1	205.6	202.9	220.6
Foreign	208.5	233.9	236.9	268.6	304.5
Total by water	621.6	638.1	603.5	626.9	691.5
By pipeline:					
Intrastate	1,113.7	1,158.1	1,172.6	1,278.1	1,329.1
Interstate	680.3	727.7	721.2	772.0	819.3
Foreign	1.1	2.5	2.6	16.8	37.3
Total by pipeline	1,795.1	1,888.3	1,896.4	2,066.9	2,185.7
By tank cars and trucks:					
Intrastate	20.6	26.1	26.2	28.9	28.9
Interstate	10.1	11.5	10.5	9.2	6.0
Total by tank cars and trucks	30.7	37.6	36.7	38.1	34.9
Grand total	2,447.4	2,564.0	2,536.6	2,731.9	2,912.1

[1] Preliminary figures.

Demand by States of Origin.—Distribution of domestic crude oil by refining States and districts can be analyzed from receipts of crude oil at refineries. When long-distance shipments are involved, various crudes may be mixed in transit or storage, and identification by origin may be only approximate.

TABLE 30.—Refinery receipts of domestic crude oil by States and districts, 1956

(Thousand barrels)

Receiving States and districts	Total domestic receipts	Intrastate receipts	Interstate receipts from—																	
			Ala. and Miss.	Ark.	Calif. and Nev.	Colo.	Fla., N. Y.	Ill.	Ind.	Kans.	Ky., Ohio	La.	Mont.	Nebr., N. Dak. and S. Dak.	N. Mex.	Okla.	Texas	Utah	W. Va.	Wyo.	Total
Delaware, Mass., R. I.	13,389		967									9,877					2,545				13,389
Florida, Ga., S. C., Va.	429		429																		429
Maryland	14,204		715									6,011					7,478				14,204
New Jersey	52,131		4,325				456					9,876					37,474				52,131
New York:																					
East	1,730		985														745				1,730
West	21,459	1,471						5,042		2,182			1,013			2,475	9,276				19,988
Pennsylvania:																					
East	86,646		550									16,526					69,570				86,646
West	13,021	10,123									989						1,547		362		2,898
West Virginia	2,584	1,817						60			707										767
District 1	205,593	13,411	7,971				456	5,102		2,182	1,696	42,290	1,013			2,475	128,635		362		192,182
Illinois	185,108	27,205				1,051			5	15,412		348	811	970	10,662	27,663	86,954			14,027	157,903
Indiana	142,954	981				2,970		4,673		23,643			4,270	2,389	553	26,701	50,140			26,634	141,973
Kansas	99,922	65,731				7,814								1,564		10,992	13,821				34,191
Kentucky, Tennessee	30,427	16,471	3,245	1,308					3,826		202	3,942					1,433				13,956
Michigan	50,037	11,681				749		5,635	794				1,312	2,061		2,591	11,916			13,298	38,356
Minnesota, Wisconsin	2,984												207	408						2,369	2,984
Missouri	24,806									2,351						2,917	15,433			4,105	24,806
Nebraska	807	33																		774	774
North and South Dakota	12,500	12,500																			
Ohio:																					
East	37,164	2,808	50			1,279		24,803		1,649	606					4,401	1,568				34,356
West	104,363	50	50			3,543		16,142			2,177	747		4,588	2,940	16,792	57,231			103	104,313
Oklahoma	125,932	97,758								12,593					1,035		14,546				28,174
District 2	817,004	235,218	3,345	1,308		17,406		51,253	4,625	55,648	2,985	5,037	6,600	11,980	15,190	92,057	253,042			61,310	581,786
Alabama, Mississippi	7,068	4,739	2,329																		2,329
Arkansas	25,630	22,397										690					2,543				3,233
Louisiana	256,412	172,277	22,029	12,835													49,271				84,135

New Mexico	8,871	7,441															1,394	36			1,430
Texas	806,062	679,532	2,020							1,097		63,230			58,422	1,761					126,530
District 3	1,104,043	886,386	26,378	12,835						1,097		63,920			58,422	1,761	53,208	36			217,657
Colorado	10,455	3,124											1,239							6,092	7,331
Montana	22,966	8,344																		14,622	14,622
Utah	30,922	2,194				27,009														1,719	28,728
Wyoming	34,039	32,351				1,629								59							1,688
District 4	98,382	46,013				28,638							1,239	59						22,433	52,369
California	343,414	343,414																			
Oregon, Washington	1,876				1,876																1,876
District 5	345,290	343,414			1,876																1,876
1956 U. S. total	2,570,312	1,524,442	37,694	14,143	1,876	46,044	456	56,355	4,625	58,927	4,681	111,247	8,852	12,039	73,612	96,293	434,885	36	362	83,743	1,045,870
1956 daily average	7,023	4,165	103	39	5	126	1	154	13	161	13	304	24	33	201	263	1,188		1	229	2,858
1955 daily average	6,703	4,007	83	38	7	108	2	148	13	172	19	278	10	19	193	261	1,138		2	205	2,696

TABLE 31.—Crude runs to stills and refinery receipts of crude oil by method of transportation by States and districts, 1956

(Thousand barrels)

Receiving State and district	Crude runs to stills	Fuel and losses	Origin of domestic crude receipts	Change in refinery stocks	Total receipts by method of transportation: Intrastate			Interstate			Foreign boats
					Pipelines	Tank cars and trucks	Boats	Pipelines	Tank cars	Boats	
Del., Mass., R. I.	22,705	16		+1,223						13,389	10,555
Fla., Ga., S. C., Va.	5,724	122	456	+630						429	6,047
Maryland	21,568	72		+131						14,204	7,567
New Jersey	134,371	43		−804						52,131	81,479
New York:											
East	14,551	47		−173						1,730	12,695
West	21,407	−5	1,471	+57	1,471			19,988			
Pennsylvania:											
East	213,254	224		−722						86,646	126,110
West	13,117	−5	10,123	−91	10,070	53		1,625	233	1,040	
West Virginia	2,588	−1	2,179	−3	1,816	1		740	27		
District 1	449,285	513	14,229	+248	13,357	54		22,353	260	169,569	244,453
Illinois	184,502	62	83,560	+544	27,203	2		157,555	348		
Indiana	142,539	3	5,606	+412	722	259		141,861	112		
Kansas	99,746	18	124,658	+158	64,231	1,500		34,158	33		
Kentucky, Tennessee	30,464	−2	19,342	−35	3,592	78	12,801	5,785	499	7,672	
Michigan	50,708	777	11,681	+318	11,050	631		35,798		2,558	[1] 1,766
Minnesota, Wisconsin	19,065	25		+199				294	1,068	1,622	[2] 16,305
Missouri	24,794	1		+11				24,806			
Nebraska	807		11,664		33			680	94		
North and South Dakota	12,388	3	12,908	+109	12,088	412					
Ohio:											
East	37,151	−1	4,668	+14	2,720	88		34,356			
West	106,193	−12		+15	7	43		104,263		50	1,833
Oklahoma	125,431	12	194,051	+489	95,934	1,824		28,173	1		
District 2	833,788	886	468,138	+2,234	217,580	4,837	12,801	567,729	2,155	11,902	19,904
Alabama, Mississippi	8,244	−15	42,433	+50	2,795	817	1,127		989	1,340	1,211
Arkansas	25,461	−29	36,540	+198	22,097	300		3,137	96		
Louisiana	255,240	304	283,524	+868	100,154	1,641	70,482	78,052	537	5,546	
New Mexico	8,742	2	81,053	+127	6,613	828		1,394	36		
Texas	815,836	86	1,114,417	+846	636,371	7,739	35,422	96,162	21	30,347	10,706
District 3	1,113,523	348	1,557,967	+2,089	768,030	11,325	107,031	178,745	1,679	37,233	11,917

Colorado	10, 398	10	49, 168	+47	2, 402	722		7, 331			
Montana	22, 828	−2	17, 196	+210	7, 517	827		14, 493	129		[3] 70
Utah	31, 049	−5	2, 230	−122	1, 604	590		28, 632	96		
Wyoming	33, 921	93	116, 094	+25	31, 355	996			1, 688		
District 4	98, 196	96	184, 688	+160	42, 878	3, 135		50, 456	1, 913		70
California	387, 947	320	345, 290	+478	287, 250	9, 542	46, 622				45, 331
Oregon, Washington	22, 367	7		−340						1, 876	[4] 20, 158
District 5	410, 314	327	345, 290	+138	287, 250	9, 542	46, 622			1, 876	65, 489
1956 U. S. total	2, 905, 106	2, 170	2, 570, 312	+4, 869	1, 329, 095	28, 893	166, 454	819, 283	6, 007	220, 580	341, 833
1956 daily average	7, 937	6	7, 023	+13	3, 631	79	455	2, 239	16	603	934
1955 daily average	7, 480	6	6, 703	−1	3, 502	79	426	2, 115	25	556	782

[1] Pipeline.
[2] Includes pipeline 16,293, tank cars and trucks 12.
[3] Tank cars and trucks.
[4] Includes pipeline 19,209, boats 949.

TABLE 32.—Daily average demand for total crude petroleum in the United States in 1955–56, by States and months

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Year
1955													
Alabama	3.7	2.5	3.3	2.8	4.2	3.2	5.1	4.2	3.2	3.6	4.3	4.3	3.7
Arkansas	73.8	85.1	80.9	76.4	80.2	75.9	76.8	84.7	75.6	82.0	80.3	81.3	79.4
California	954.3	937.9	942.2	993.7	1,000.7	987.1	1,006.0	1,003.3	1,031.8	994.6	969.1	930.1	979.4
Colorado	130.2	161.9	122.2	143.3	130.0	152.7	159.1	141.2	146.0	151.8	157.9	153.8	145.7
Florida	(1)	.3	3.2	.7	.3	.4	1.7	.8	2.5	1.3	(1)	3.6	1.2
Illinois	217.7	211.8	248.0	192.9	194.2	255.6	240.8	244.2	257.3	232.2	212.5	239.9	229.1
Indiana	20.6	39.6	27.1	26.0	36.5	28.0	35.8	30.1	29.7	29.1	25.5	32.0	30.0
Kansas	337.0	341.4	338.5	324.0	349.2	324.9	339.0	336.8	348.9	281.4	342.5	342.0	333.7
Kentucky	44.4	41.4	32.7	41.9	39.7	45.5	41.1	49.8	43.1	53.7	34.6	41.7	42.5
Louisiana	694.6	747.3	692.5	730.3	713.7	764.5	704.5	767.5	714.2	779.7	767.2	789.4	738.7
Michigan	30.3	40.3	32.8	27.7	32.6	29.9	29.2	30.2	30.8	29.9	29.4	29.2	31.0
Mississippi	88.1	101.4	99.8	103.9	92.7	96.4	107.4	111.1	104.2	110.3	110.5	112.1	103.2
Missouri, Nevada, South Dakota, Tennessee, Virginia	.5	.5	.6	.6	.5	.5	.5	.4	.4	.4	.4	.6	.5
Montana	47.1	46.6	42.4	42.5	48.3	43.0	36.2	47.0	36.4	33.8	35.8	37.4	41.3
Nebraska	18.5	18.7	29.2	23.3	27.2	25.9	23.2	36.1	19.3	40.4	40.6	35.7	28.3
New Mexico	230.5	221.8	208.9	218.1	206.6	246.5	225.6	204.2	222.6	213.7	256.8	238.6	224.4
New York	8.4	8.6	8.6	8.4	6.1	8.3	8.1	8.4	8.4	8.2	7.7	7.7	8.1
North Dakota	32.4	32.1	34.9	6.2	21.8	38.8	37.8	36.3	36.6	16.0	38.2	39.1	30.8
Ohio	11.1	12.4	9.3	9.3	12.4	12.7	12.8	10.7	12.4	13.0	14.9	12.3	11.9
Oklahoma	535.9	570.1	529.3	583.7	551.2	574.5	579.5	568.1	553.7	583.5	513.0	608.6	562.6
Pennsylvania	26.3	22.5	23.0	25.8	20.1	29.0	20.9	14.9	19.2	25.2	30.6	27.8	23.8
Texas	2,921.6	3,002.7	2,875.7	2,694.1	2,819.5	2,753.9	2,868.0	2,897.2	2,773.9	2,786.7	2,976.5	2,982.5	2,862.2
Utah	5.4	6.5	5.6	6.3	6.0	6.5	6.5	6.5	6.6	6.4	5.1	5.6	6.1
West Virginia	4.9	6.0	8.3	5.3	7.4	5.5	4.7	6.7	2.8	5.5	9.2	7.5	6.2
Wyoming	272.2	250.4	278.7	236.8	255.5	275.2	288.5	278.1	272.9	263.1	277.0	264.5	267.9
Total domestic crude	6,709.5	6,909.8	6,677.7	6,524.0	6,656.6	6,784.4	6,858.8	6,918.5	6,752.5	6,745.5	6,939.6	7,027.3	6,791.7
Foreign crude	734.1	729.6	762.4	701.7	710.1	778.1	807.3	765.7	816.8	815.2	848.1	855.7	777.4
Grand total 1955	7,443.6	7,639.4	7,440.1	7,225.7	7,366.7	7,562.5	7,666.1	7,684.2	7,569.3	7,560.7	7,787.7	7,883.0	7,569.1
Pennsylvania Grade (included above)	43.9	41.7	42.8	41.2	37.5	46.5	38.1	32.8	34.0	41.9	52.7	46.3	41.2
1956 [2]													
Alabama	4.3	2.9	3.1	2.4	1.3	8.6	6.2	13.5	12.1	8.9	17.1	6.2	7.2
Arkansas	77.3	74.7	60.2	64.8	90.2	81.1	87.8	76.5	76.5	68.5	87.3	78.4	77.0
California	988.4	970.6	962.9	936.8	980.0	947.3	994.8	913.6	983.0	898.9	973.8	966.5	959.6
Colorado	156.4	169.0	147.1	157.7	172.0	153.5	166.8	153.6	178.7	162.5	153.4	158.7	160.7
Florida	----	.1	----	.1	3.2	----	3.7	.4	.6	3.4	1.2	2.2	1.3
Illinois	215.8	245.5	203.4	223.2	216.6	214.2	217.7	224.8	213.1	213.3	233.8	244.8	222.1
Indiana	27.2	27.1	27.1	28.1	30.1	31.5	30.0	29.2	37.5	29.9	38.9	41.4	31.5
Kansas	341.8	353.9	333.0	306.0	315.1	317.4	350.0	358.2	342.5	304.9	334.9	342.8	333.4
Kentucky	55.0	47.0	44.1	47.5	48.7	41.7	53.5	31.5	48.9	49.1	54.6	50.8	47.7

Louisiana	800.6	816.7	820.2	788.6	840.3	816.6	745.9	767.1	789.5	777.5	824.5	908.5	807.9
Michigan	33.7	33.6	28.4	28.1	28.0	26.4	31.4	28.3	31.2	28.5	27.7	24.9	29.2
Mississippi	109.0	115.0	106.0	110.9	120.2	106.5	101.5	114.2	117.3	117.0	89.6	123.0	110.9
Missouri, Nevada, South Dakota, Tennessee, Virginia	.4	.5	.6	.5	.4	.5	.5	.5	.4	.5	.4	.3	.5
Montana	53.8	54.4	47.6	38.0	60.2	54.1	68.3	55.3	43.3	59.7	62.6	69.3	55.6
Nebraska	39.1	33.7	53.2	21.0	45.2	37.2	46.3	40.8	65.4	58.2	47.0	52.7	45.1
New Mexico	247.0	226.3	258.5	233.2	238.0	205.2	241.0	239.6	245.0	198.1	310.8	266.1	242.4
New York	7.5	7.5	7.4	6.0	7.6	7.8	7.9	7.8	7.0	7.7	7.4	7.4	7.4
North Dakota	40.1	39.7	38.7	25.7	27.7	40.4	39.4	37.2	39.9	24.2	43.8	41.4	36.5
Ohio	13.4	12.6	12.2	10.7	11.9	15.4	12.4	11.8	15.2	13.5	14.8	15.1	13.2
Oklahoma	585.9	574.7	594.8	545.8	560.3	581.4	550.6	597.4	589.0	568.2	596.9	658.0	583.7
Pennsylvania	27.5	20.1	24.1	21.2	25.2	24.8	26.0	23.2	23.5	23.5	26.7	22.2	24.1
Texas	3,140.4	3,111.0	3,061.6	2,935.0	3,012.5	3,193.7	2,986.9	3,024.5	2,968.6	2,823.0	3,146.5	3,299.5	3,058.2
Utah	6.0	6.0	4.6	4.4	4.7	4.1	5.3	8.6	7.1	7.5	7.4	7.8	6.1
West Virginia	6.2	6.1	6.5	5.5	7.2	6.4	7.1	6.6	5.1	7.1	5.3	4.0	6.1
Wyoming	303.6	325.1	269.2	222.0	234.5	297.0	282.6	312.2	274.4	275.4	304.0	295.3	282.8
Total domestic crude	7,280.4	7,273.8	7,114.5	6,763.2	7,081.1	7,212.8	7,063.6	7,076.4	7,114.8	6,729.0	7,410.4	7,687.3	7,150.2
Foreign crude	852.6	853.7	898.0	817.1	908.4	974.2	1,029.3	1,024.9	1,020.2	990.0	951.7	884.8	934.1
Grand total 1956	8,133.0	8,127.5	8,012.5	7,580.3	7,989.5	8,187.0	8,092.9	8,101.3	8,135.0	7,719.0	8,362.1	8,572.1	8,084.3
Pennsylvania Grade (included above)	45.3	37.7	41.9	35.7	42.5	43.7	44.8	40.2	40.3	42.7	43.5	37.5	41.3

[1] Less than 100 barrels per day.

[2] Preliminary figures.

TABLE 33.—Demand for total crude petroleum in the United States, 1955–56, by States of origin and months

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
1955													
Alabama	115	71	103	85	131	95	157	129	95	113	129	133	1,356
Arkansas	2,288	2,384	2,508	2,293	2,486	2,279	2,381	2,626	2,268	2,543	2,410	2,521	28,987
California	29,585	26,260	29,208	29,810	31,022	29,612	31,186	31,101	30,953	30,832	29,073	28,834	357,476
Colorado	4,032	4,534	3,789	4,300	4,031	4,582	4,933	4,376	4,380	4,706	4,736	4,768	53,167
Florida	1	8	100	20	8	11	52	25	75	41	1	113	455
Illinois	6,748	5,931	7,688	5,787	6,021	7,669	7,465	7,569	7,720	7,198	6,374	7,437	83,607
Indiana	639	1,108	841	780	1,131	839	1,111	933	890	903	764	993	10,932
Kansas	10,448	9,559	10,492	9,721	10,824	9,747	10,509	10,442	10,467	8,722	10,276	10,602	121,809
Kentucky	1,375	1,160	1,013	1,258	1,230	1,366	1,273	1,544	1,293	1,666	1,037	1,293	15,508
Louisiana	21,534	20,923	21,469	21,908	22,126	22,935	21,840	23,791	21,425	24,172	23,018	24,472	269,613
Michigan	939	1,129	1,018	831	1,011	898	904	936	925	928	883	905	11,307
Mississippi	2,730	2,839	3,093	3,117	2,875	2,892	3,328	3,444	3,125	3,418	3,316	3,474	37,651
Missouri, Nevada, South Dakota, Tennessee, Virginia	15	13	19	18	17	16	17	12	12	13	13	18	183
Montana	1,460	1,304	1,313	1,276	1.496	1,290	1,123	1,457	1,092	1,047	1,074	1,160	15,092
Nebraska	572	524	905	699	844	778	720	1,118	578	1,251	1,217	1,106	10,312
New Mexico	7,146	6,209	6,475	6,543	6,403	7,396	6,994	6,331	6,678	6,625	7,705	7,397	81,902
New York	261	240	266	253	189	249	252	260	251	253	231	239	2,944
North Dakota	1,005	900	1,081	185	677	1,163	1,171	1,124	1,098	495	1,146	1,212	11,257
Ohio	348	347	287	278	383	382	398	332	373	402	446	381	4,357
Oklahoma	16,611	15,963	16,407	17,511	17,087	17,235	17,966	17,610	16,612	18,090	15,390	18,867	205,349
Pennsylvania	816	631	714	773	623	870	647	461	576	780	918	863	8,672
Texas	90,570	84,076	89,147	80,822	87,404	82,618	88,907	89,812	83,218	86,387	89,294	92,457	1,044,712
Utah	168	181	175	190	187	196	201	203	197	197	153	174	2,222
West Virginia	151	167	258	159	230	165	147	209	85	169	276	232	2,248
Wyoming	8,438	7,011	8,639	7,104	7,919	8,249	8,944	8,618	8,186	8,152	8,310	8,201	97,771
Total domestic crude	207,995	193,472	207,008	195,721	206,355	203,532	212,626	214,463	202,572	209,103	208,190	217,852	2,478,889
Foreign crude	22,757	20,429	23,634	21,052	22,013	23,344	25,025	23,736	24,505	25,270	25,443	26,527	283,735
Grand total 1955	230,752	213,901	230,642	216,773	228,368	226,876	237,651	238,199	227,077	234,373	233,633	244,379	2,762,624
Daily average:													
Domestic crude	6,710	6,910	6,678	6,524	6,657	6,784	6,859	6,918	6,752	6,745	6,940	7,027	6,792
Domestic and foreign crude	7,444	7,639	7,440	7,226	7,367	7,563	7,666	7,684	7,569	7,560	7,788	7,883	7,569
Pennsylvania Grade (included above)	1,361	1,145	1,326	1,237	1,161	1,394	1,181	1,017	1,019	1,300	1.589	1,434	15,164

1956[1]													
Alabama	132	85	95	71	42	259	193	417	363	275	513	191	2, 636
Arkansas	2, 396	2, 165	1, 867	1, 944	2, 797	2, 432	2, 723	2, 370	2, 296	2, 124	2, 620	2, 430	28, 164
California	30, 640	28, 146	29, 851	28, 104	30, 380	28, 418	30, 838	28, 322	29, 489	27, 866	29, 213	29, 963	351, 230
Colorado	4, 848	4, 901	4, 560	4. 731	5, 333	4, 606	5, 170	4, 762	5, 360	5, 037	4, 601	4, 920	58, 829
Florida	----------	3	----------	2	100	----------	115	12	17	105	35	69	458
Illinois	6, 689	7, 122	6, 306	6, 697	6, 716	6, 425	6, 750	6, 968	6, 393	6, 612	7, 013	7, 589	81, 280
Indiana	843	785	839	842	932	946	931	906	1, 125	928	1, 166	1, 284	11, 527
Kansas	10, 594	10, 262	10, 323	9, 181	9, 769	9, 521	10, 851	11, 105	10, 276	9, 451	10, 048	10, 627	122, 008
Kentucky	1, 705	1, 363	1, 367	1, 424	1, 509	1, 252	1, 659	978	1, 466	1, 522	1, 638	1, 576	17, 459
Louisiana	24, 819	23, 684	25, 426	23. 657	26, 049	24, 496	23, 122	23, 780	23, 684	24, 102	24, 737	28, 162	295, 718
Michigan	1, 045	973	881	842	868	793	973	877	935	884	828	771	10, 670
Mississippi	3, 378	3, 336	3, 286	3, 328	3, 726	3, 196	3, 147	3, 542	3, 522	3, 625	2, 687	3, 814	40, 587
Missouri, Nevada, South Dakota, Tennessee, Virginia	15	16	15	15	16	17	14	15	13	15	12	10	173
Montana	1, 668	1, 579	1, 475	1, 141	1, 866	1, 622	2, 117	1, 713	1, 299	1, 852	1, 878	2, 147	20, 357
Nebraska	1, 213	977	1, 650	631	1, 400	1, 115	1, 436	1, 265	1, 961	1, 803	1, 411	1, 634	16, 496
New Mexico	7, 659	6, 562	8, 015	6, 996	7, 378	6, 157	7, 470	7, 430	7, 348	6, 141	9, 324	8, 250	88, 730
New York	234	218	229	180	235	235	245	242	210	239	222	230	2, 719
North Dakota	1, 243	1, 152	1, 201	771	858	1, 211	1, 220	1, 154	1, 198	751	1, 315	1, 284	13, 358
Ohio	414	364	377	322	369	462	384	365	457	420	444	467	4, 845
Oklahoma	18, 164	16, 667	18, 438	16, 374	17, 369	17, 441	17, 069	18, 518	17, 670	17, 615	17, 908	20, 397	213, 630
Pennsylvania	853	582	748	636	780	744	806	718	704	727	800	685	8, 783
Texas	97, 353	90, 218	94, 909	88, 050	93, 387	95, 810	92, 593	93, 758	89, 059	87, 514	94, 394	102, 286	1, 119, 331
Utah	186	175	143	131	146	123	164	268	214	234	221	242	2, 247
West Virginia	189	178	202	167	222	190	220	206	154	221	160	125	2. 234
Wyoming	9, 412	9, 427	8, 346	6, 659	7, 268	8, 911	8, 762	9, 678	8, 231	8, 536	9, 123	9, 153	103, 506
Total domestic crude	225, 692	210, 940	220, 549	202, 896	219, 515	216, 382	218, 972	219, 369	213, 444	208, 599	222, 311	238, 306	2, 616, 975
Foreign crude	26, 430	24, 759	27, 839	24, 514	28. 159	29, 227	31, 909	31, 770	30, 606	30, 691	28, 552	27, 430	341, 886
Grand total 1956	252, 122	235, 699	248, 388	227, 410	247, 674	245, 609	250, 881	251, 139	244, 050	239, 290	250, 863	265, 736	2, 958, 861
Daily average:													
Domestic crude	7, 280	7, 274	7, 115	6, 763	7, 081	7, 213	7, 064	7. 076	7, 115	6, 729	7, 410	7, 687	7, 150
Domestic and foreign crude	8, 133	8, 128	8, 013	7, 580	7, 989	8, 187	8, 093	8, 101	8, 135	7, 719	8, 362	8, 572	8, 084
Pennsylvania Grade (included above)	1, 403	1, 093	1, 298	1, 072	1, 319	1, 312	1, 389	1, 245	1, 210	1, 323	1, 305	1, 163	15, 132

[1] Preliminary figures.

STOCKS

The total stocks of all oils increased 65.5 million barrels in 1956, including a 58.1-million-barrel increase in stocks of refined products, a 7.0-million-barrel rise in natural-gas-liquids stocks, and a 0.4-million-barrel advance in crude-oil stocks.

The small increase in crude-oil stocks compared with product and natural-gas-liquid stocks was due to the heavy withdrawal from crude stocks in November and December for shipment to refineries in Europe, whose supplies were cut off by closing of the Suez Canal. In the last 2 months of 1956 crude stocks were reduced 20.5 million barrels. As of October 31 crude stocks totaled 286.6 million barrels—a record high.

TABLE 34.—Stocks of crude petroleum, natural-gas liquids, and refined products in continental United States, at end of year, 1952–56

(Thousand barrels)

Product	1952	1953	1954	1955	1956
Crude petroleum:					
At refineries	66, 275	72, 738	67, 309	66, 852	71, 721
Pipeline and tank farm	187, 852	182, 934	172, 081	178, 771	173, 278
Producers	17, 801	18, 773	18, 995	19, 987	21, 015
Total crude petroleum	271, 928	274, 445	258, 385	265, 610	266, 014
Natural-gas liquids	7, 807	10, 428	14, 038	13, 564	20, 559
Refined products	394, 019	440, 634	442, 510	435, 685	493, 818
Grand total	673, 754	725, 507	714, 933	714, 859	780, 391

TABLE 35.—Stocks of crude petroleum in continental United States in 1956, by States of origin and months [1]

(Thousand barrels)

State of origin	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Alabama	157	176	233	313	440	600	598	697	616	534	560	388	555
Arkansas	2, 223	2, 183	2, 247	2, 781	3, 216	2, 897	2, 847	2, 626	2, 751	2, 849	3, 193	3, 081	3, 204
California	28, 772	28, 248	28, 225	28, 357	29, 167	28, 741	29, 168	28, 153	29, 563	28, 725	30, 370	29, 683	28, 979
Colorado	3, 835	3, 873	3, 664	4, 058	4, 235	4, 080	4, 401	4, 185	4, 270	3, 664	3, 465	3, 531	3, 552
Florida	107	150	186	229	267	207	246	172	200	221	155	158	128
Illinois	8, 784	9, 059	8, 397	9, 134	9, 254	9, 605	9, 872	9, 939	9, 961	10, 136	10, 631	10, 332	9, 660
Indiana	389	394	426	466	452	502	496	539	534	478	594	479	375
Kansas	8, 641	8, 545	8, 085	8, 513	9, 652	10, 277	11, 101	10, 774	10, 444	10, 118	10, 815	10, 753	10, 466
Kentucky	1, 554	1, 310	1, 357	1, 477	1, 483	1, 471	1, 663	1, 481	1, 974	1, 886	1, 897	1, 751	1, 723
Louisiana	16, 466	16, 290	15, 952	15, 969	16, 993	15, 595	15, 223	16, 282	16, 898	16, 981	17, 164	17, 533	18, 697
Michigan	770	659	674	708	750	821	897	832	872	781	826	857	979
Mississippi	2, 912	2, 977	2, 851	3, 094	3, 016	2, 666	2, 780	3, 056	2, 956	2, 758	2, 543	3, 194	2, 897
Montana	1, 762	1, 792	1, 778	2, 087	2, 646	2, 540	2, 688	2, 462	2, 561	3, 003	2, 992	3, 062	3, 028
Nebraska	1, 687	1, 600	1, 788	1, 483	2, 169	2, 117	2, 351	2, 351	2, 456	1, 853	1, 509	1, 431	1, 386
New Mexico	8, 160	8, 175	8, 418	7, 966	8, 073	7, 868	8, 736	8, 539	8, 522	8, 472	9, 853	7, 831	7, 323
New York	73	70	74	69	116	121	112	98	95	95	100	101	102
North Dakota	599	730	613	712	833	824	699	654	697	620	802	728	736
Ohio	668	636	637	639	702	736	655	683	742	688	724	686	608
Oklahoma	21, 630	22, 373	23, 625	24, 511	25, 870	26, 207	26, 158	26, 879	26, 366	25, 653	25, 261	24, 517	23, 016
Pennsylvania	1, 955	1, 817	1, 850	1, 760	1, 774	1, 726	1, 686	1, 573	1, 576	1, 526	1, 532	1, 404	1, 402
Texas	124, 547	122, 594	121, 746	122, 991	126, 035	125, 483	119, 526	120, 688	122, 986	123, 932	127, 050	122, 911	116, 388
Utah	36	37	33	34	34	33	33	41	45	49	44	54	58
West Virginia	675	664	666	646	656	629	624	587	574	591	564	580	620
Wyoming	16, 140	15, 658	14, 572	15, 176	16, 830	18, 378	18, 179	18, 281	17, 590	17, 808	18, 114	17, 576	17, 117
Total domestic crude	252, 542	250, 010	248, 097	253, 173	264, 663	264, 124	260, 739	261, 572	265, 249	263, 421	270, 758	262, 621	252, 999
Foreign [2]	13, 068	11, 582	11, 407	12, 510	12, 458	13, 373	13, 752	15, 436	14, 695	15, 370	15, 802	13, 374	13, 015
Grand total	265, 610	261, 592	259, 504	265, 683	277, 121	277, 497	274, 491	277, 008	279, 944	278, 791	286, 560	275, 995	266, 014
Pennsylvania Grade (includes above)	2, 964	2, 791	2, 822	2, 695	2, 788	2, 752	2, 663	2, 497	2, 522	2, 453	2, 438	2, 322	2, 351

[1] Final figures.
[2] Includes foreign crude petroleum held in district 5; December 1955, 2,383,000; January, 1, 972,000; February, 1,417,000; March, 1,754,000; April, 2,048,000; May, 3,214,000; June, 3,014,000; July, 3,937,000; August, 3,587,000; September, 4,173,000; October, 4,153,000; November, 3,228,000; December, 2,845,000 barrels.

TABLE 36.—Stocks of crude petroleum in continental United States in 1956, by location and months [1]

(Thousand barrels)

State	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Alabama	596	662	635	675	621	738	597	692	580	668	864	757	621
Arkansas	1,809	1,792	2,002	2,418	2,916	2,681	2,553	2,421	2,439	2,299	2,669	2,696	2,649
California, Oregon, Washington	31,140	30,213	29,642	30,111	31,215	31,955	32,182	32,090	33,150	32,898	34,523	32,911	31,824
Colorado	1,749	1,813	1,829	1,740	1,884	1,848	1,700	1,679	1,808	1,943	1,960	1,784	1,860
Florida, Georgia, South Carolina, Virginia	351	482	415	407	444	470	474	603	712	1,164	986	1,284	1,002
Illinois	15,917	15,441	16,413	16,109	17,096	16,723	17,542	17,481	17,298	16,914	17,361	17,015	16,838
Indiana	4,235	4,466	4,281	4,581	4,493	4,785	4,962	4,588	4,680	4,843	4,862	4,556	4,643
Iowa, Missouri	7,204	7,249	7,137	7,258	7,648	7,445	7,396	7,465	7,369	7,347	7,137	7,016	6,572
Kansas	11,532	11,022	10,578	10,623	12,680	12,773	12,001	11,952	11,928	11,375	11,866	11,017	10,640
Kentucky, Tennessee	3,197	2,906	3,040	3,316	3,257	3,580	3,408	3,384	3,543	3,541	3,429	3,704	3,394
Louisiana	13,695	14,110	13,866	13,777	14,194	13,483	13,369	13,481	13,668	13,491	13,800	13,668	14,908
Maryland	1,104	1,172	1,271	1,136	1,164	1,120	1,322	1,429	1,246	1,267	1,268	1,072	1,235
Massachusetts, Delaware, Rhode Island	864	850	548	773	716	807	796	645	1,477	2,162	1,536	1,754	2,087
Michigan	1,346	1,374	1,333	1,415	1,335	1,338	1,449	1,458	1,446	1,390	1,487	1,367	1,651
Minnesota, Wisconsin	987	1,010	947	1,160	1,025	1,181	1,074	1,154	1,506	1,265	1,169	1,160	1,186
Mississippi	1,637	1,669	1,802	1,771	1,956	1,850	2,000	1,994	1,796	1,531	1,837	1,918	1,739
Montana	1,774	1,859	1,846	1,833	2,149	1,987	1,940	2,060	2,161	2,375	2,526	2,596	2,740
Nebraska	1,661	1,488	1,446	1,596	1,676	1,613	1,780	1,779	1,559	1,560	1,569	1,617	1,561
New Jersey	6,195	5,168	6,407	5,583	5,847	5,627	4,766	5,688	6,799	6,049	6,596	6,107	5,507
New Mexico	2,645	2,336	2,390	2,642	2,381	2,387	2,309	2,226	2,417	2,542	2,517	2,848	2,833
New York	1,298	1,139	1,201	1,391	1,241	1,083	1,172	1,249	1,132	1,189	1,172	1,061	1,192
North Dakota	589	725	611	708	827	750	696	654	667	611	752	719	704
Ohio	6,929	6,881	7,010	7,681	7,749	8,133	8,146	7,490	7,604	7,766	8,340	8,345	7,966
Oklahoma	25,762	26,689	27,998	29,238	30,316	31,384	31,109	30,648	29,735	28,924	29,077	28,345	25,213
Pennsylvania	10,647	9,749	9,893	10,551	9,670	9,886	9,543	9,855	9,577	10,253	10,158	8,706	9,430
Texas	99,590	98,527	94,732	96,724	100,846	98,929	96,970	99,338	100,481	100,781	104,327	99,013	94,440
Utah	824	738	680	801	704	572	556	633	686	666	621	665	714
West Virginia	720	702	719	685	695	681	594	586	573	574	594	573	604
Wyoming	9,613	9,360	8,832	8,980	10,376	11,688	12,085	12,286	11,907	11,403	11,557	11,721	10,261
Total	265,610	261,592	259,504	265,683	277,121	277,497	274,491	277,008	279,944	278,791	286,560	275,995	266,014

[1] Final figures.

TABLE 37.—Stocks of crude petroleum in continental United States in 1956, by classification and location [1]

(Thousand barrels)

Classification and location	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
At refineries:													
Alabama	298	329	372	419	294	372	347	370	292	375	437	326	364
Arkansas	290	272	299	469	699	519	431	386	464	428	523	511	488
California, Oregon, Washington	11, 130	11, 352	10, 165	10, 732	11, 936	12, 542	12, 094	12, 028	12, 174	12, 787	12, 731	12, 365	11, 268
Colorado	210	355	322	361	322	270	246	249	283	358	307	258	257
Florida, Georgia, South Carolina, Virginia	244	332	337	286	283	383	348	550	619	1, 033	935	1, 195	874
Illinois	3, 686	3, 560	4, 447	4, 002	4, 320	4, 128	3, 972	4, 038	4, 055	3, 618	3, 867	4, 269	4, 230
Indiana	1, 774	1, 887	1, 801	1, 900	1, 848	2, 094	2, 076	1, 870	1, 894	2, 178	1, 998	1, 922	2, 186
Kansas	1, 363	1, 241	1, 412	1, 260	1, 907	1, 853	1, 665	1, 304	1, 399	1, 329	1, 910	1, 641	1, 521
Kentucky, Tennessee	1, 093	848	967	1, 282	1, 038	1, 194	1, 183	1, 129	1, 172	1, 220	981	1, 079	1, 058
Louisiana	4, 787	5, 544	5, 626	5, 011	5, 232	5, 086	4, 735	4, 934	4, 996	4, 716	5, 105	4, 654	5, 655
Maryland	1, 104	1, 172	1, 271	1, 136	1, 164	1, 120	1, 322	1, 429	1, 246	1, 267	1, 268	1, 072	1, 235
Massachusetts, Delaware, Rhode Island	864	850	548	773	716	807	796	645	1, 477	2, 162	1, 536	1, 754	2, 087
Michigan	628	712	608	712	694	664	758	738	833	777	792	673	946
Minnesota, Wisconsin	987	1, 010	947	1, 160	1, 025	1, 181	1, 074	1, 154	1, 506	1, 265	1, 169	1, 160	1, 186
Mississippi	22	17	15	21	16	22	18	23	19	19	15	8	6
Missouri	328	458	402	417	300	363	346	392	412	373	327	395	339
Montana	552	549	499	499	736	595	536	695	661	682	779	664	762
Nebraska	52	46	34	31	44	58	58	62	67	38	57	58	52
New Jersey	6, 069	5, 042	6, 281	5, 457	5, 772	5, 606	4, 751	5, 682	6, 799	6, 049	6, 361	5, 991	5, 265
New Mexico	185	227	192	324	352	370	336	328	338	369	355	332	312
New York	1, 069	894	949	1, 150	1, 013	867	1, 024	1, 060	914	978	957	838	953
North Dakota	234	382	323	326	430	351	299	259	268	197	365	333	343
Ohio	1, 797	1, 785	2, 037	2, 375	2, 183	2, 159	1, 880	1, 897	1, 802	1, 742	1, 889	1, 820	1, 826
Oklahoma	2, 861	3, 563	3, 629	3, 990	3, 742	3, 231	3, 413	2, 950	2, 855	2, 763	2, 983	3, 081	3, 350
Pennsylvania	8, 721	7, 913	8, 031	8, 617	7, 650	7, 905	7, 780	8, 232	7, 803	8, 598	8, 530	7, 160	7, 908
Texas	14, 932	16, 217	15, 722	16, 076	17, 125	15, 754	15, 043	16, 577	16, 317	16, 239	17, 565	15, 490	15, 778
Utah	617	497	449	558	467	337	331	392	455	438	404	425	495
West Virginia	41	50	45	41	53	58	58	52	52	38	48	59	38
Wyoming	914	836	786	767	848	817	885	872	823	713	984	883	939
Total at refineries	66, 852	67, 940	68, 516	70, 152	72, 209	70, 706	67, 805	70, 297	71. 995	72, 749	75, 178	70, 416	71, 721

See footnotes at end of table.

TABLE 37.—Stocks of crude petroleum in continental United States in 1956, by classification and location [1]—Continued

(Thousand barrels)

Classification and location	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Pipeline and tank-farm stocks:													
Alabama	290	323	250	249	316	353	235	301	273	275	411	414	235
Arkansas	1,154	1,145	1,333	1,589	1,857	1,787	1,752	1,660	1,610	1,496	1,776	1,805	1,771
California	14,946	13,790	14,467	14,170	14,047	14,175	14,863	14,857	15,699	14,883	16,456	15,205	15,132
Colorado	1,294	1,188	1,222	1,079	1,297	1,308	1,199	1,175	1,255	1,315	1,383	1,256	1,343
Florida, New Jersey	217	263	199	238	226	99	132	47	83	121	275	193	356
Illinois	11,646	11,281	11,366	11,527	12,181	12,010	12,980	12,858	12,668	12,701	12,899	12,161	12,013
Indiana	2,396	2,514	2,420	2,616	2,585	2,631	2,821	2,658	2,721	2,600	2,799	2,564	2,392
Iowa, Missouri	6,876	6,791	6,735	6,841	7,348	7,082	7,050	7,073	6,957	6,974	6,810	6,621	6,233
Kansas	9,329	8,936	8,386	8,498	9,883	10,035	9,481	9,783	9,674	9,161	9,071	8,516	8,249
Kentucky, Tennessee	2,039	1,993	2,013	1,974	2,159	2,331	2,165	2,200	2,311	2,261	2,383	2,560	2,271
Louisiana	7,243	6,911	6,570	7,056	7,262	6,707	6,869	6,882	6,967	6,945	7,055	7,344	7,483
Michigan	558	512	570	548	481	524	541	565	463	458	545	544	550
Mississippi	1,225	1,247	1,387	1,335	1,535	1,443	1,577	1,586	1,387	1,107	1,437	1,515	1,358
Montana	922	1,010	1,052	1,044	1,108	1,097	1,104	1,070	1,195	1,383	1,427	1,607	1,653
Nebraska	1,524	1,352	1,327	1,475	1,537	1,470	1,637	1,627	1,402	1,432	1,417	1,459	1,414
New Mexico	1,500	1,244	1,383	1,453	1,144	1,122	1,088	983	1,249	1,273	1,262	1,611	1,551
New York	199	215	222	211	198	186	118	159	188	181	185	193	209
North Dakota	197	196	198	198	198	200	200	201	197	199	197	198	200
Ohio	5,052	5,016	4,893	5,226	5,486	5,894	6,186	5,513	5,722	5,944	6,371	6,445	6,060
Oklahoma	21,491	21,681	22,959	23,773	25,004	26,593	26,181	26,133	25,325	24,696	24,504	23,789	20,378
Pennsylvania	1,771	1,671	1,707	1,779	1,860	1,831	1,613	1,473	1,629	1,505	1,483	1,401	1,367
Texas	78,283	75,565	72,275	74,573	77,551	76,390	74,992	75,726	77,204	77,437	79,487	76,358	71,837
Utah	186	218	216	220	214	211	202	218	209	207	194	201	195
West Virginia	509	482	504	479	477	458	371	369	356	371	386	354	401
Wyoming	7,924	7,839	7,396	7,553	8,853	10,176	10,525	10,714	10,379	9,970	9,868	10,163	8,627
Total pipeline and tank-farm stocks	178,771	173,383	171,050	175,704	184,807	186,113	185,882	185,831	187,123	184,895	190,081	184,477	173,278
Producers' stocks	19,987	20,269	19,938	19,827	20,105	20,678	20,804	20,880	20,826	21,147	21,301	21,102	21,015
Grand total: 1956	265,610	261,592	259,504	265,683	277,121	277,497	274,491	277,008	279,944	278,791	286,560	275,995	266,014
1955	258,385	260,156	258,630	264,430	275,232	276,948	270,850	264,601	256,427	256,269	259,201	260,707	265,610

[1] Final figures.

VALUE AND PRICE

The average value of crude oil at the well in the United States was $2.78 per barrel in 1956—up 1 cent from 1955. The total value of crude oil at the well was 393.1 million dollars higher than in 1955, due primarily to the increase of 133 million barrels in crude production in 1956.

The posted prices as tabulated for representative grades of crudes showed few changes for other than the Pennsylvania Grade oils, the posted prices of which were increased several times during the year, and for some grades of crudes of California origin, which posted two price increases.

TABLE 38.—Value of crude petroleum at wells in the United States, 1955–56, by States

State	1955		1956 [1]	
	Total (thousand dollars)	Average per barrel	Total (thousand dollars)	Average per barrel
Arkansas	76, 880	$2. 71	78, 400	$2. 69
California	887, 030	2. 50	920, 765	2. 62
Colorado	144, 800	2. 75	162, 758	2. 78
Illinois	236, 940	2. 91	240, 717	2. 93
Indiana	31, 980	2. 91	33, 733	2. 93
Kansas	340, 670	2. 80	345, 494	2. 79
Kentucky	44, 850	2. 89	51, 297	2. 91
Louisiana:				
Gulf Coast	668, 580	2. 94	739, 257	2. 94
Northern	124, 700	2. 86	134, 387	2. 89
Total Louisiana	793, 280	2. 93	873, 644	2. 93
Michigan	32, 900	2. 92	31, 223	2. 87
Mississippi	92, 840	2. 46	99, 401	2. 45
Montana	35, 380	2. 26	55, 787	2. 58
Nebraska	30, 810	2. 75	45, 184	2. 79
New Mexico	227, 310	2. 74	241, 706	2. 75
New York	10, 310	3. 55	12, 091	4. 40
North Dakota	32, 200	2. 89	39, 135	2. 90
Ohio	12, 580	2. 89	15, 024	3. 14
Oklahoma	563, 830	2. 78	597, 744	2. 78
Pennsylvania	30, 200	3. 54	35, 718	4. 34
Texas:				
Gulf Coast	668, 330	3. 02	680, 303	3. 00
West Texas	1, 148, 720	2. 77	1, 253, 742	2. 75
East Texas proper	232, 010	2. 89	224, 776	2. 89
Other districts	940, 270	2. 79	982, 232	2. 80
Total Texas	2, 989, 330	2. 84	3, 141, 053	2. 83
West Virginia	7, 080.	3. 05	8, 410	3. 86
Wyoming	239, 750	2. 41	254, 939	2. 44
Alabama, Florida, Missouri, Nevada, South Dakota, Tennessee, Utah, Virginia	9, 430	2. 18	13, 471	2. 26
Total United States	6, 870, 380	2. 77	7, 297, 694	2. 79

[1] Preliminary figures.

TABLE 39.—Posted price per barrel of petroleum at wells in the United States in 1956, by grade, with date of change [1]

Date	Pennsylvania Grade: Bradford and Allegheny districts	Pennsylvania Grade: In southwest Pennsylvania	Corning Grade in Buckeye Pipe Line Co.	Western Kentucky	Indiana-Illinois Basin	Midland, Mich.	Oklahoma-Kansas: 34°–34.9°	Oklahoma-Kansas: 36°–36.9°
Jan. 1	$3.85	$3.43	$2.72	$3.00	$3.00	$3.08	$2.78	$2.82
Feb. 6	4.00	3.58						
Mar. 16	4.20	3.78						
May 16	4.45	4.03						
June 12				2.90	2.90			
July 16	4.57	4.15						
Aug. 16	4.68	4.21						

Date	Panhandle Texas (Carson, Gray, Hutchinson, and Wheeler Counties), 35°–35.9°	West Texas, 30°–30.9° (sweet)	Lea County, N. Mex., 30°–30.9° (sour)	South Texas, Duval-Mirando, 24°–24.9°	East Texas	Gulf Coast: Conroe, Tex.	Gulf Coast: Texas 30°–30.9°	Gulf Coast: Texas 20°–20.9°	Gulf Coast: Louisiana 30°–30.9°
Jan. 1	$2.80	$2.70	$2.57	$2.88	$2.90	$3.13	$2.90	$2.70	$2.85
June 28				3.03					

Date	Rodessa, La., 36°–36.9°	Smackover, Ark.	Elk Basin, Wyo., 30°–30.9° (heavy)	Salt Creek, Wyo., 36°–36.9° (light)	California: Coalinga, 32°–32.9°	California: Kettleman Hills, 37°–37.9°	California: Midway Sunset, 19°–19.9°	California: Wilmington, 24°–24.9°
Jan. 1	$2.82	$2.33	$2.39	$2.75	$3.05	$3.30	$2.28	$2.65
Feb. 7							2.31	2.66
Nov. 19					3.12		2.62	2.88
Dec. 1			2.46					

[1] Source: Platt's Oil Price Handbook and Oilmanac, 1956, compiled and published by McGraw-Hill Publishing Co., Inc.

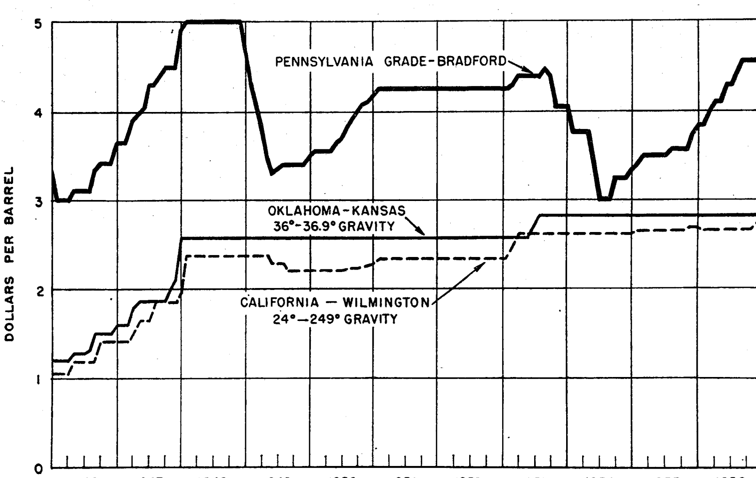

FIGURE 5.—Posted prices of selected grades of crude petroleum in the United States, 1946–56, by months.

REFINED PRODUCTS

GENERAL REVIEW

Petroleum is consumed in a variety of finished products that must be considered individually. Competition with other fuels and economic and climatic conditions influence the consumption of these products.

Gasoline is consumed principally in highway transport, aviation, and mechanized farming. The demand for kerosine (a product defined as meeting lamp-oil specifications for color and flash point) has been drastically affected, especially in rural areas, by the increased competition from electricity and liquefied petroleum. Distillate fuel oil, including light diesel oils, is used for space heating and for diesel locomotive fuel, and has nearly replaced residual fuel oil and coal in railroad use. Residual fuel oil usually sells for less than crude oil at the refineries and competes directly with natural gas and coal for heavy fuel uses. As it cannot be moved by pipeline, its distribution depends on cheap water transport and limited tank-car movement. Therefore, it cannot normally compete with coal in coal-producing areas. Liquified gases, in competition with kerosine and light distillate fuel oil in domestic application, are gaining importance as fuels in internal-combustion engines and as the starting raw material in synthesizing many petrochemicals. Jet fuels (a blend of gasoline, kerosine, and distillate fuel oils) are replacing gasoline in military combat aircraft.

The daily average total demand for all oils was 9,186,000 barrels, a 4.1-percent gain over the 1955 daily average of 8,827,000 barrels. Domestic demand increased 297,000 barrels daily from 1955, and exports were 62,000 barrels daily higher.

Exports remained below those in 1955 until November, when shipments to Europe increased to relieve the oil shortage created by blocking of the Suez Canal and the blowing up of the Iraq pipeline.

The increased domestic demand for 1956 was 3.5 percent compared with the 8.4-percent gain in 1955. In the first half of 1956, industrial production was well above that in 1955 for the same period. The corresponding comparison for the latter half showed a much smaller gain. This smaller increase was reflected in the domestic demand for petroleum. An additional factor—the weather—also unfavorably affected petroleum demand. In the last quarter of 1956 the weather was much warmer than normal. Industry deliveries of petroleum products to the military forces in 1956 totaled almost 158,000,000 barrels—a 9-percent gain over 1955. Jet fuel (the principal product purchased) accounted for 43 percent of the military receipts, and Aviation-grade gasoline comprised 26 percent.

The new supply of refined products comprises the refinery output from crude oil, the production of natural-gas liquids, a small amount of motor benzol derived from coal, and imports of refined products from other countries. Crude runs to stills, the production of natural-gas liquids, and imports increased in 1956 at a rate exceeding demand, and stocks at the close of 1956 were 58 million barrels above the December 31, 1955, level. The 1956 refinery yields of petroleum products from crude oil continued the trend in effect for many years.

TABLE 40.—Salient statistics of the major refined petroleum products in continental United States, 1952–56

(Thousand barrels)

Product	1952	1952 [1]	1953	1954	1955	1956 [2]
Gasoline (finished and natural):						
Production	1,192,097	1,178,027	1,266,376	1,261,304	1,373,950	1,428,100
Imports	1,761	1,761	459	1,185	4,809	[3] 1,042
Exports	36,285	36,285	37,925	34,366	34,521	35,394
Stocks, end of year	135,599	134,737	157,872	155,400	165,433	187,271
Domestic demand	1,157,280	1,142,987	1,205,775	1,230,595	1,334,205	1,371,910
Kerosine:						
Production	1,132,300	128,767	123,200	122,305	117,137	123,480
Transfers from gasoline plants					[4] 1,950	1,781
Imports						1
Exports	7,821	7,821	7,265	4,852	3,335	3,320
Stocks, end of year	26,842	26,529	[5] 28,684	27,826	26,770	31,420
Domestic demand	124,725	121,253	114,467	118,311	116,808	117,292
Distillate fuel oil:						
Production	520,378	517,920	528,111	542,278	602,547	665,687
Transfers from gasoline plants					[4] 615	818
Transfers from crude	2,705	2,705	1,966	1,500	1,347	1,375
Imports	2,742	2,742	3,379	3,195	4,413	5,167
Exports	33,515	33,515	32,328	24,223	24,605	34,392
Stocks, end of year	99,582	99,375	[5] 111,741	108,144	111,333	133,981
Domestic demand	479,347	476,986	488,075	526,347	581,128	616,007
Residual fuel oil:						
Production	453,897	453,897	449,979	416,757	420,331	426,699
Transfers from crude	6,343	6,343	5,617	5,924	5,559	6,439
Imports	128,479	128,479	131,533	129,124	152,035	161,846
Exports	27,701	27,701	25,991	26,753	33,799	27,976
Stocks, end of year	48,706	48,706	49,370	52,105	39,174	44,491
Domestic demand	555,165	555,165	560,474	522,317	557,057	561,691
Jet fuel:						
Production		20,929	35,747	46,550	56,648	66,443
From gasoline		14,938	25,086	32,889	43,262	51,472
From kerosine		3,533	6,551	9,934	9,887	11,124
From distillate		2,458	4,110	3,727	3,499	3,847
Imports						[6] 5,634
Exports			409	149	120	186
Stocks, end of year		[7] 1,811	2,666	3,215	3,457	5,322
Domestic demand		[8] 20,126	34,483	45,852	56,286	70,026
Lubricants:						
Production	55,600	55,600	52,545	53,243	55,836	59,211
Imports				1		
Exports:						
Grease	451	451	325	412	440	427
Oil	15,580	15,580	12,674	14,663	13,858	13,431
Stock, end of year	11,021	11,021	10,070	9,702	8,763	10,182
Domestic demand	38,165	38,165	40,497	38,537	42,477	43,934
Wax (1 barrel=280 pounds):						
Production	4,331	4,331	4,978	5,290	5,293	5,367
Imports				1		
Exports	1,036	1,036	1,126	1,342	1,248	921
Stocks, end of year	575	575	538	562	551	658
Domestic demand	3,443	3,443	3,889	3,925	4,056	4,339
Coke (5 barrels=1 short ton):						
Production	18,123	18,123	21,607	24,284	28,337	31,095
Exports	4,205	4,205	3,661	3,261	4,517	6,426
Stocks, end of year	513	513	860	2,107	1,534	1,319
Domestic demand	13,924	13,924	17,599	19,776	24,403	24,874

See footnotes at end of table.

TABLE 40.—Salient statistics of the major refined petroleum products in continental United States, 1952–56—Continued

(Thousand barrels)

Product	1952	1952 [1]	1953	1954	1955	1956 [2]
Asphalt (5.5 barrels=1 short ton):						
Production	70, 312	70, 312	72, 409	74, 912	83, 121	90, 636
Imports	2, 697	2, 697	2, 502	3, 394	3, 325	3, 847
Exports	2, 301	2, 301	1, 710	1, 868	1, 567	1, 478
Stocks, end of year	6, 321	6, 321	7, 314	7, 175	7, 768	9, 150
Domestic demand	71, 007	71, 007	72, 208	76, 577	84, 286	91, 623
Road oil:						
Production	6, 998	6, 998	6, 594	7, 213	8, 482	8, 027
Stocks, end of year	453	453	437	434	560	501
Domestic demand	6, 947	6, 947	6, 610	7, 216	8, 356	8, 086
Still gas (1 barrel=3,600 cu. ft.):						
Production	95, 275	95, 275	102, 243	102, 552	116, 506	121, 993
Liquefied gases:						
Production [9]	30, 968	30, 968	33, 306	34, 169	43, 615	51, 962
Transfers of liquefied gas [10] from natural-gasoline plants	79, 708	79, 708	88, 512	98, 394	108, 325	109, 840
Exports	2, 402	2, 402	3, 002	3, 953	4, 277	4, 274
Stocks, end of year	638	638	792	941	1, 032	1, 393
Domestic demand	108, 304	108, 304	118, 662	128, 461	147, 572	157, 167
Miscellaneous:						
Production	7, 258	7, 258	9, 091	11, 013	10, 806	12, 493
Transfers from gasoline plants	----------	----------	----------	----------	[4] 2, 677	2, 347
Exports	195	195	244	292	330	306
Stocks, end of year	1, 036	1, 036	1, 001	1, 236	1, 327	1, 476
Domestic demand	7, 098	7, 098	8, 882	10, 486	13, 062	14, 385
Unfinished gasoline:						
Rerun (net)	[11] 489	(12)	(12)	(12)	(12)	(12)
Stocks, end of year	8, 236	(12)	(12)	(12)	(12)	(12)
Other unfinished oils:						
Rerun (net)	4, 136	4, 136	422	7, 974	11, 231	4, 008
Transfers of other products from natural-gasoline plants	4, 110	4, 110	4, 236	4, 772	(4)	(4)
Imports	3, 237	3, 237	3, 171	7, 576	5, 561	2, 669
Stocks, end of year	62, 304	62, 304	69, 289	73, 663	67, 993	66, 654
Shortage	(2, 552)	(2, 552)	(7, 184)	(8, 468)	(12, 356)	(15, 704)

[1] Figures on 1953 basis because figures are shown separately for jet fuel; unfinished gasoline is included with gasoline; total as of January 1, 1952, 134,221,000 barrels; kerosine 26,836,000; distillate fuel oil, 86,509,000 barrels.
[2] Preliminary figures.
[3] Excludes jet fuel.
[4] Production at natural-gasoline plants shown as direct "transfers" and omitted from the input and output at refineries.
[5] Stocks figures as of Jan. 1, 1953, were revised to 27,216,000 barrels for kerosine and 98,688,000 barrels for distillate fuel oil, new basis, because 1 company reported incorrectly.
[6] Imports of jet fuel formerly included with gasoline.
[7] Stocks figure on Jan. 1, 1952, was 1,008,000 barrels, previously included with gasoline, kerosine, and distillate fuel oil on Dec. 31, 1951.
[8] Includes exports of 42,526 barrels not included in total United States exports for the year.
[9] Liquefied refinery gases (LR-gases).
[10] Liquefied petroleum gases (LP-gases).
[11] Negative quantity; represents net excess of unfinished oils produced over unfinished oils rerun.
[12] Included with gasoline (finished and natural).

Residual fuel oil and kerosine yields continued to decline. The slight drop in gasoline yields for the year reflects the industry's efforts to reduce high stocks of gasoline.

The monthly wholesale price index for petroleum and petroleum products compiled by the Bureau of Labor Statistics increased from 112.8 in 1955 to 118.2 in 1956—a record high. The average wholesale price for the 4 principal products increased from 9.06 cents per gallon in 1955 to 9.43 cents per gallon in 1956. Wholesale prices of residual fuel oil showed the largest change for the year, increasing from an average of $2.14 per barrel in January to $2.53 per barrel in December.

TABLE 41.—Input and output of petroleum products at refineries in the United States, 1952–56

(Thousand barrels)

	1952	1952 [1]	1953	1954	1955	1956 [2]
Input:						
Crude petroleum:						
Domestic	2,235,198	2,235,198	2,321,820	2,300,766	2,446,833	2,563,655
Foreign	206,061	206,061	233,045	238,798	283,385	341,451
Total crude petroleum	2,441,259	2,441,259	2,554,865	2,539,564	2,730,218	2,905,106
Natural-gas liquids	103,898	103,898	111,293	117,549	126,382	135,062
Total input	2,545,157	2,545,157	2,666,158	2,657,113	2,856,600	3,040,168
Output:						
Gasoline	1,155,916	[3] 1,141,467	1,233,954	1,232,989	1,331,528	1,396,787
Kerosine	132,300	128,767	123,200	122,305	117,137	[4] 123,480
Distillate fuel oil	520,378	517,920	528,111	542,278	602,547	[4] 665,687
Residual fuel oil	453,897	453,897	449,979	416,757	420,331	426,699
Jet fuel	([5])	20,929	35,747	46,550	56,648	66,443
Lubricants	55,600	55,600	52,545	53,243	55,836	59,211
Wax [6]	4,331	4,331	4,978	5,290	5,293	5,367
Coke [6]	18,123	18,123	21,607	24,284	28,337	31,095
Asphalt [6]	70,312	70,312	72,409	74,912	83,121	90,636
Road oil	6,998	6,998	6,594	7,213	8,482	8,027
Still gas [6]	95,275	95,275	102,243	102,552	116,506	121,993
Liquefied gases	30,968	30,968	33,306	34,169	43,615	51,962
Other finished products	7,258	7,258	9,091	11,013	10,806	12,493
Unfinished gasoline (net)	489					
Other unfinished oils (net)	[7] 4,136	[7] 4,136	[7] 422	[7] 7,974	[7] 11,231	[7] 4,008
Shortage (or overage)[8]	−2,552	−2,552	−7,184	−8,468	−12,356	−15,704
Total output	2,545,157	2,545,157	2,666,158	2,657,113	2,856,600	3,040,168

[1] On 1953 basis, separating jet fuel from its components.
[2] Preliminary figures.
[3] New basis, including unfinished gasoline.
[4] Production at natural gasoline plants shown as direct "transfers" and omitted from the input and output refineries.
[5] Jet fuel was included in gasoline, kerosine, and distillate fuel.
[6] Conversion factors: 280 pounds of wax to the barrel; 5.0 barrels of coke to the short ton; 5.5 barrels of asphalt to the short ton; 3,600 cubic feet of still gas to the barrel.
[7] Negative quantity; represents net excess of unfinished oils rerun over unfinished oils produced.
[8] Includes losses or gains in volume during processing.

TABLE 42.—Percentage yields of refined petroleum products in the United States, 1947–56

Product	1947	1948	1948[1]	1949	1950	1951	1952	1952[2]	1953	1954	1955	1956[3]
Finished products:												
Gasoline:												
Cracked	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Straight run	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	------	------
Total gasoline	40.2	40.3	40.1	43.7	43.0	42.4	43.0	42.4	43.9	43.8	44.0	43.4
Kerosine	6.0	6.0	6.0	5.2	5.6	5.7	5.4	5.3	4.8	4.8	4.3	4.2
Distillate fuel oil	16.8	18.7	18.5	17.5	19.0	20.0	21.3	21.2	20.7	21.3	22.0	22.9
Residual fuel oil	24.1	23.0	23.5	21.7	20.2	19.7	18.5	18.5	17.6	16.4	15.3	14.7
Jet fuel	------	------	------	------	------	------	(5)	.8	1.4	1.8	2.1	2.3
Lubricating oil	2.8	2.5	2.5	2.3	2.5	2.6	2.3	2.3	2.1	2.1	2.0	2.0
Wax	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
Coke	.7	.7	.7	.9	.8	.8	.7	.7	.8	1.0	1.0	1.1
Asphalt	2.7	2.6	2.5	2.5	2.8	2.8	2.9	2.9	2.8	2.9	3.0	3.1
Road oil	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3
Still gas	4.6	4.0	4.0	4.2	4.0	4.1	3.9	3.9	4.0	4.0	4.3	4.2
Liquefied gases	(6)	(6)	(6)	(6)	(6)	(6)	1.3	1.3	1.3	1.3	1.6	1.8
Other finished products	1.3	1.5	1.5	1.4	1.6	1.7	.3	.3	.4	.4	.4	.4
Unfinished products (net):												
Gasoline	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)
Other	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
Shortage	.2	.1	.1	------	------	[9].3	[9].1	[9].1	[9].3	[9].3	[9].5	[9].6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Yields computed on the 1949 basis for California to compare with succeeding years.
[2] Yields computed on the 1953 basis to show jet fuel separately.
[3] Preliminary figures.
[4] Not separated after 1946.
[5] Included in statistics of gasoline, kerosine, and distillate fuel oil.
[6] Included in "Other."
[7] Added to finished gasoline production in computing yields after 1946.
[8] Added to crude in computing yields after 1946.
[9] Negative percentage; represents excess rerun over that produced.

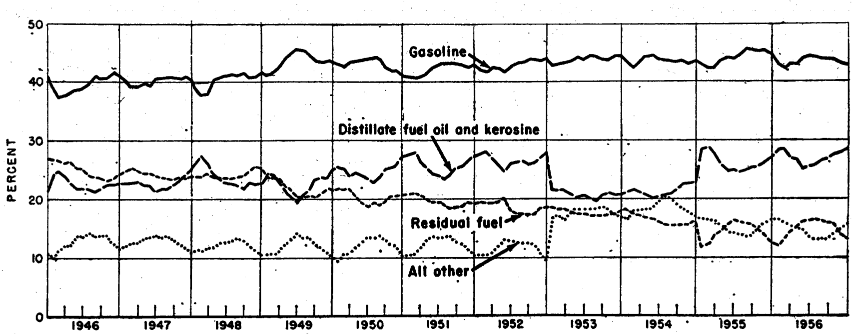

FIGURE 6.—Yields of principal products from crude runs to stills in the United States, 1946–56, by months.

TABLE 43.—Stocks of refined petroleum products in continental United States at end of month, 1955–56

(Thousand barrels)

Product	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
1955												
Gasoline [1]	328,977	315,259	309,586	311,064	323,768	332,319	353,891	366,359	376,070	389,136	377,033	342,710
Jet fuel	3,472	3,368	3,566	3,607	3,480	3,619	3,456	3,542	3,329	3,229	3,197	3,457
Lubricating oil	10,162	10,087	9,779	9,615	9,430	9,233	8,947	8,547	8,291	8,108	8,433	8,763
Wax	579	578	542	552	554	590	602	573	561	535	536	551
Coke	2,245	2,369	2,380	2,491	2,363	2,198	2,184	2,012	1,806	1,648	1,536	1,524
Asphalt	8,623	9,888	10,869	11,779	11,524	9,943	9,107	6,918	5,789	5,669	6,504	7,768
Road oil	472	534	640	814	907	868	772	590	552	514	539	560
Liquefied refinery gases	941	845	898	905	952	957	1,160	1,100	1,143	1,239	1,119	1,032
Miscellaneous	1,215	1,285	1,228	1,144	1,141	1,291	1,246	1,269	1,253	1,223	1,266	1,327
Other unfinished oils	71,362	69,476	69,707	71,696	73,024	72,520	73,385	72,146	73,446	71,644	71,790	67,993
Total 1955	428,048	413,689	409,195	413,667	427,143	433,538	454,750	463,056	472,240	482,945	471,953	435,685
1956												
Gasoline [1]	329,603	321,812	310,743	307,837	321,091	336,018	365,271	389,287	409,315	415,736	405,244	397,163
Jet fuel	4,081	4,148	4,336	4,178	4,664	4,372	4,090	4,574	4,637	4,424	4,576	5,322
Lubricating oil	9,167	9,309	9,646	9,725	9,542	9,754	9,694	9,547	9,664	9,536	10,060	10,182
Wax	538	566	517	502	550	566	566	577	608	605	611	658
Coke	1,607	1,666	1,720	1,734	1,719	1,712	1,777	1,704	1,681	1,540	1,558	1,319
Asphalt	9,051	10,608	12,067	13,187	12,954	11,423	9,635	7,680	6,832	6,601	7,755	9,150
Road oil	439	477	669	913	1,076	1,055	1,032	712	711	575	507	501
Liquefied refinery gases	805	776	778	864	1,007	1,064	1,125	1,061	1,285	1,234	1,166	1,393
Miscellaneous	1,416	1,407	1,645	1,458	1,389	1,491	1,562	1,503	1,358	1,444	1,350	1,476
Other unfinished oils	65,113	65,296	66,437	66,553	69,998	73,025	74,259	70,400	70,486	67,095	69,950	66,654
Total 1956	421,820	416,065	408,558	406,951	423,990	440,480	469,011	487,045	506,577	508,790	502,777	493,818

[1] Includes kerosine, distillate fuel oil, residual fuel oil, and unfinished gasoline.

TABLE 44.—Input and output of petroleum products at refineries in the United States, 1955–56, by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1955													
Input:													
Crude petroleum	228,737	211,365	228,594	214,080	225,699	224,510	234,986	234,966	224,478	231,411	230,758	240,634	2,730,218
Natural-gas liquids	10,857	9,451	10,067	9,486	10,027	10,001	10,475	10,643	10,614	11,903	11,379	11,479	126,382
Total input	239,594	220,816	238,661	223,566	235,726	234,511	245,461	245,609	235,092	243,314	242,137	252,113	2,856,600

Output:													
Gasoline [1]	110,276	99,875	107,274	102,279	109,043	109,292	116,057	116,954	110,873	116,742	113,634	119,229	1,331,528
Kerosine	12,431	10,286	10,866	9,258	9,065	7,923	8,767	8,797	8,270	9,391	10,055	12,028	117,137
Distillate fuel oil	53,858	51,661	52,713	46,001	47,033	48,802	48,788	50,187	48,557	49,934	50,347	54,666	602,547
Residual fuel oil	38,276	34,683	36,722	33,288	34,426	32,392	33,823	33,794	31,815	34,821	36,412	39,879	420,331
Jet fuel	4,163	4,265	5,285	4,243	4,845	5,007	4,549	5,029	4,968	5,076	4,754	4,464	56,648
Lubricating oil	4,565	3,992	4,602	4,691	4,740	4,818	4,557	4,871	4,526	4,666	5,115	4,693	55,836
Wax [2]	433	427	466	441	423	464	433	408	416	445	482	455	5,293
Coke [2]	2,285	2,181	2,428	2,190	2,381	2,396	2,412	2,335	2,086	2,366	2,597	2,680	28,337
Asphalt [2]	4,246	4,230	5,067	6,278	7,827	8,799	9,506	9,462	9,047	8,082	6,017	4,560	83,121
Road oil	197	233	353	478	856	1,141	1,516	1,577	1,049	588	293	201	8,482
Still gas [2]	8,188	7,905	9,279	9,462	10,510	10,537	10,955	10,688	9,493	10,045	9,458	9,986	116,506
Liquefied refinery gases	3,521	3,271	3,451	3,240	3,453	3,709	3,811	3,695	3,653	3,987	3,656	4,168	43,615
Other miscellaneous	745	791	939	789	871	910	971	946	780	946	945	1,173	10,806
Other unfinished oils (net)	[3] 2,658	[3] 2,058	[3] 232	1,512	1,026	[3] 1,027	373	[3] 1,796	615	[3] 2,387	[3] 281	[3] 4,318	[3] 11,231
Shortage or overage	(932)	(926)	(552)	(584)	(773)	(652)	(1,057)	(1,338)	(1,056)	(1,388)	(1,347)	(1,751)	(12,356)
Total output	239,594	220,816	238,661	223,566	235,726	234,511	245,461	245,609	235,092	243,314	242,137	252,113	2,856,600
1956 [4]													
Input:													
Crude petroleum	248,721	233,374	245,340	224,623	244,784	242,119	248,439	247,851	240,708	235,842	240,944	252,361	2,905,106
Natural-gas liquids	10,883	9,507	10,240	10,092	10,323	10,273	10,863	11,118	11,399	13,455	13,145	13,764	135,062
Total input	259,604	242,881	255,580	234,715	255,107	252,392	259,302	258,969	252,107	249,297	254,089	266,125	3,040,168
Output:													
Gasoline [1]	119,130	108,613	115,758	106,719	116,438	116,391	120,201	121,592	117,075	115,534	115,780	123,556	1,396,787
Kerosine [5]	11,940	11,165	10,590	8,978	9,058	8,704	9,170	9,716	9,872	11,044	11,508	11,735	123,480
Distillate fuel oil [5]	59,617	55,622	56,045	51,387	51,665	52,640	54,775	57,007	55,354	54,917	55,245	61,413	665,687
Residual fuel oil	41,674	37,291	37,618	33,892	35,609	32,951	33,037	33,823	31,868	33,543	35,471	39,922	426,699
Jet fuel	4,494	5,053	5,752	4,961	6,183	5,615	5,668	5,890	5,861	5,619	5,316	6,031	66,443
Lubricating oil	4,985	4,536	4,996	5,108	5,164	5,010	4,749	5,005	4,706	5,112	4,970	4,870	59,211
Wax [2]	444	444	479	388	485	448	399	466	441	450	446	477	5,367
Coke [2]	2,657	2,497	2,616	2,268	2,477	2,689	2,759	2,674	2,593	2,523	2,596	2,746	31,095
Asphalt [2]	4,433	4,733	5,948	6,636	8,072	9,434	10,025	10,571	9,805	9,502	6,572	4,905	90,636
Road oil	164	211	409	594	868	1,270	1,443	1,222	990	414	228	214	8,027
Still gas [2]	9,435	8,929	10,276	9,919	10,975	11,195	11,320	11,200	10,200	9,645	9,137	9,762	121,993
Liquefied refinery gases	4,516	4,156	4,243	4,382	4,431	4,012	4,568	4,321	4,296	4,211	4,146	4,680	51,962
Other miscellaneous [5]	832	773	935	953	1,121	1,173	1,118	1,020	1,204	1,259	959	1,146	12,493
Other unfinished oils (net)	[3] 3,036	76	1,061	[3] 77	3,336	2,814	981	[3] 4,176	[3] 369	[3] 3,670	2,611	[3] 3,559	[3] 4,008
Shortage or overage	(1,681)	(1,218)	(1,146)	(1,393)	(775)	(1,954)	(911)	(1,362)	(1,789)	(806)	(896)	(1,773)	(15,704)
Total output	259,604	242,881	255,580	234,715	255,107	252,392	259,302	258,969	252,107	249,297	254,089	266,125	3,040,168

[1] Includes unfinished gasoline (net).

[2] Conversion factors: 280 pounds of wax to the barrel; 5.0 barrels of coke to the short ton; 5.5 barrels of asphalt to the short ton; 3,600 cubic feet of still gas to the barrel.

[3] Negative quantity; represents net excess of unfinished oils rerun over unfinished oil produced.

[4] Preliminary figures.

[5] Production at natural-gasoline plants shown as direct "transfers" and omitted from the input and output at refineries.

TABLE 45.—Input and output of petroleum products at refineries in the United States, 1955–56, by districts

(Thousand barrels)

	East Coast	Appalachian	Indiana, Illinois, Kentucky, etc.	Minnesota, Wisconsin, etc.	Oklahoma, Kansas, etc.	Texas Inland	Texas Gulf Coast	Louisiana Gulf Coast	Arkansas-Louisiana Inland, etc.	New Mexico	Rocky Mountain	West Coast	Total
1955													
Input:													
Crude petroleum	388,768	70,842	499,776	(1)	245,071	92,631	671,765	239,377	33,262	7,750	92,899	388,077	2,730,218
Natural-gas liquids	3,065	277	15,186	(1)	13,737	22,907	31,813	7,099	670	557	2,055	29,016	126,382
Total input	391,833	71,119	514,962	(1)	258,808	115,538	703,578	246,476	33,932	8,307	94,954	417,093	2,856,600
Output:													
Gasoline [2]	159,210	33,261	262,563	(1)	141,263	67,678	312,796	120,568	12,520	4,090	43,162	174,417	1,331,528
Kerosine [3]	11,290	3,424	25,417	(1)	6,488	2,764	41,753	20,035	2,480	136	1,427	1,923	117,137
Distillate fuel oil [3]	98,514	13,637	99,187	(1)	58,261	17,969	166,004	59,053	7,910	1,303	21,887	58,822	602,547
Residual fuel oil	76,198	7,276	63,421	(1)	12,413	7,919	88,977	16,376	2,257	1,057	13,632	130,805	420,331
Jet fuel	2,859	1,898	4,876	(1)	7,176	3,440	13,495	6,371	302	800	2,007	13,424	56,648
Lubricating oil	7,786	4,765	4,763	(1)	4,390	144	21,163	5,771	1,904	-------	188	4,962	55,836
Wax [2]	1,692	424	219	(1)	439	56	1,175	741	-------	-------	85	462	5,293
Coke [2]	1,611	357	10,606	(1)	4,247	938	2,767	2,670	801	-------	1,087	3,253	28,337
Asphalt [4]	18,965	3,030	15,968	(1)	9,297	4,447	5,764	5,057	4,600	420	4,471	11,102	83,121
Road oil	116	67	1,627	(1)	1,158	15	10	1	1	-------	2,312	3,175	8,482
Still gas [4]	14,080	3,848	24,506	(1)	8,890	5,031	28,153	9,147	1,337	67	3,668	17,779	116,506
Liquefied refinery gases	4,590	209	3,773	(1)	2,981	1,698	14,330	9,817	326	82	482	5,327	43,615
Other miscellaneous [3]	1,829	167	1,481	(1)	868	345	1,467	1,769	124	13	101	2,642	10,806
Other unfinished oils (net)	[5] 5,660	[5] 1,032	995	(1)	512	582	7,621	[5] 4,247	[5] 683	19	204	[5] 9,542	[5] 11,231
Shortage or overage	(1,247)	(212)	(4,440)	(1)	425	2,512	(1,897)	(6,653)	53	320	241	(1,458)	(12,356)
Total output	391,833	71,119	514,962	(1)	258,808	115,538	703,578	246,476	33,932	[6] 8,307	94,954	417,093	2,856,600
1956 [7]													
Input:													
Crude petroleum	412,173	74,263	514,406	31,453	250,778	99,419	716,417	254,700	34,245	8,742	98,196	410,314	2,905,106
Natural-gas liquids	2,369	105	15,294	229	14,008	24,572	36,411	12,107	602	756	1,841	26,768	135,062
Total input	414,542	74,368	529,700	31,682	264,786	123,991	752,828	266,807	34,847	9,498	100,037	437,082	3,040,168
Output:													
Gasoline [2]	167,980	33,664	264,164	15,210	138,475	71,775	335,447	128,253	12,903	4,583	46,513	177,820	1,396,787
Kerosine [3]	13,125	3,778	27,517	2,405	5,648	2,986	41,948	20,081	2,545	136	1,496	1,815	123,480
Distillate fuel oil [3]	110,069	15,497	104,954	8,057	61,667	18,816	185,161	66,197	7,986	1,609	22,936	62,738	665,687
Residual fuel oil	75,801	7,497	64,791	2,615	12,116	8,999	91,913	19,089	2,164	1,191	13,177	127,346	426,699
Jet fuel	2,917	1,764	5,077	388	10,943	4,472	13,491	6,867	414	954	2,772	16,384	66,443
Lubricating oil	8,911	4,897	5,193	-------	4,859	65	21,929	6,295	1,852	-------	199	5,011	59,211
Wax [4]	1,835	440	232	-------	523	43	1,074	672	-------	-------	77	471	5,367

Coke [4]	1, 977	445	10, 585	1, 078	5, 096	708	2, 856	2, 853	822	--------	1, 294	3, 381	31, 095
Asphalt [4]	20, 332	3, 104	16, 032	910	10, 418	4, 508	5, 907	5, 316	4, 912	462	5, 892	12, 843	90, 636
Road oil	131	48	1, 899	------------	1, 278	--------	9	1	1	--------	1, 566	3, 094	8, 027
Still gas [4]	14, 269	3, 997	25, 479	868	9, 648	5, 529	29, 357	9, 105	1, 192	134	4, 106	18, 309	121, 993
Liquefied refinery gases	5, 207	269	4, 070	633	3, 882	2, 503	16, 010	11, 509	313	87	571	6, 908	51, 962
Other miscellaneous [3]	2, 025	219	1, 514	29	853	363	2, 282	1, 600	88	--------	127	3, 393	12, 493
Other unfinished oils (net)	[5] 8, 166	[5] 650	1, 724	[5] 33	[5] 83	552	8, 351	[5] 4, 626	[5] 539	[5] 23	[5] 591	76	[5] 4, 008
Shortage or overage	(1, 871)	(601)	(3, 531)	(478)	(537)	2, 672	(2, 907)	(6, 405)	194	365	(98)	(2, 507)	(15, 704)
Total output	414, 542	74, 368	529, 700	31, 682	264, 786	123, 991	752, 828	266, 807	34, 847	9, 498	100, 037	437, 082	3, 040, 168

[1] Included with Indiana, Illinois, etc.
[2] Includes unfinished gasoline (net).
[3] Production at natural-gasoline plants shown as direct "transfers" and omitted from the input and output at refineries.
[4] Conversion factor: 280 pounds of wax to the barrel; 5.0 barrels of coke the short ton; 5.5 barrels of asphalt to the short ton; 3,600 cubic feet of still gas to the barrel.
[5] Negative quantity; represents net excess of unfinished oils rerun over unfinished oils produced.
[6] Formerly included with Rocky Mountain.
[7] Preliminary figures.

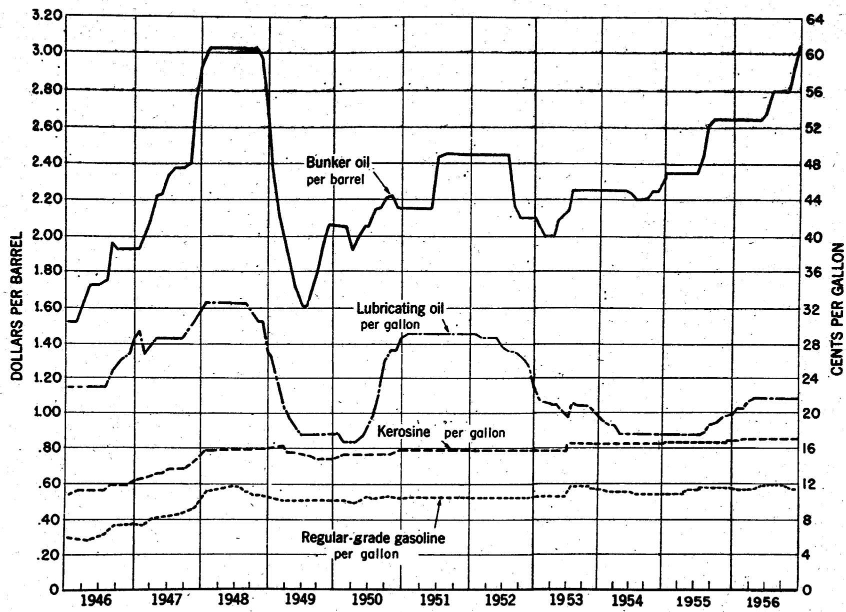

FIGURE 7.—Average prices of Bunker "C" oil at New York, bright stock at Oklahoma refineries, tank-wagon prices of kerosine at Chicago, and regular grade gasoline at refineries in Oklahoma, 1946–56, by months.

REFINERY CAPACITY

The total crude-oil capacity of petroleum refineries in the United States as of January 1, 1957, was 9,124,000 barrels daily—491,000 barrels per day above the January 1, 1956 total. For the first time in 11 years the number of refineries increased. Three new refineries in the East Coast district and one in the Texas Gulf Coast district were put into operation during the year. Crude-oil capacity under

TABLE 46.—Petroleum-refinery capacity in the United States, January 1, 1952–57

	Number of refineries				Capacity (barrels per day)			
	Operating	Shut down	Total	Building	Operating	Shut down	Total	Building
1952	327	23	350		7,161,366	171,519	7,332,885	282,680
1953	315	28	343	4	7,481,701	[1] 156,960	7,638,661	509,721
1954	308	29	337	7	7,782,103	[1] 224,794	8,006,897	397,500
1955	296	30	326	4	8,069,154	[1] 351,476	8,420,630	146,800
1956	294	24	318	2	8,380,801	[1] 251,589	8,632,390	267,000
1957	298	21	319	3	8,808,841	[1] 314,833	9,123,674	256,350

[1] Includes 18,941 in 1953; 22,920 in 1954; 34,586 in 1955; 49,754 in 1956; and 51,977 in 1957 reported as inoperative without reconditioning.

construction on January 1, 1957, totaled 256,350 barrels, and an additional 123,000 barrels' capacity was reported being built as replacement for existing facilities. Included in the total new construction were 2 refineries in Washington with a combined crude-oil capacity of 50,000 barrels and 1 in New Mexico with a planned processing capacity of 6,500 barrels daily.

AVIATION GASOLINE

The total demand for aviation gasoline increased 5.6 million barrels in 1956. Exports were 1.0 million barrels higher and domestic demand 4.6 million barrels above those in 1955. The demand for 115–145 octane gasoline continued to climb upward, showing a gain of 7.1 million barrels for the year. Military deliveries were down 6 percent in 1956. Most of the increased demand was for gasoline in the 115–145 octane range.

Jet fuels, also important to the aircraft-fuel picture, are not included in aviation gasoline. They are reported in this chapter as a separate product.

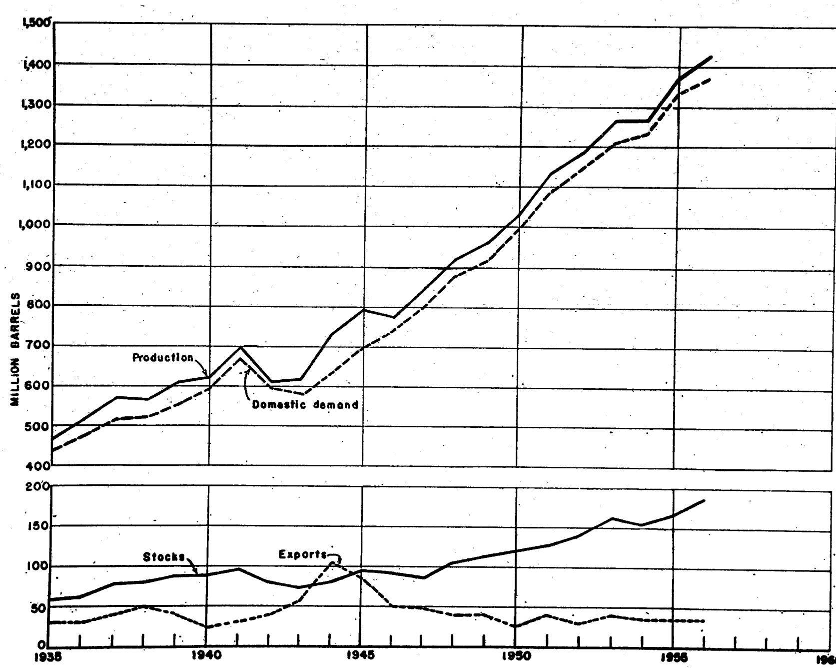

FIGURE 8.—Production, domestic demand, exports, and stocks of gasoline in the United States, 1935–56.

TABLE 47.—Salient statistics of aviation gasoline in the United States, 1955, by months

(Thousand barrels)

	1955												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
Production, by grades:													
115–145 octane	2,846	2,893	2,961	3,024	3,385	3,877	2,886	3,429	3,429	3,327	3,215	3,999	39,271
108–135 octane	308	194	254	321	358	244	421	367	434	345	403	328	3,977
100–130 octane	2,910	2,658	2,719	3,088	2,753	3,048	3,635	3,431	2,980	3,808	3,185	3,120	37,335
91–98 octane	425	286	448	336	516	514	453	577	659	512	555	564	5,845
Other grades	220	75	242	241	329	351	368	386	302	261	213	163	3,151
Alkylate	1,310	1,139	1,593	868	1,430	892	1,552	1,226	1,130	1,010	724	955	13,829
Products by districts:													
District 1	486	506	560	550	449	595	609	677	570	493	478	560	6,533
District 2	924	752	948	686	1,062	990	1,184	1,151	1,036	1,013	950	1,074	11,770
District 3	4,630	4,434	4,888	4,980	5,209	5,346	5,540	5,552	5,374	5,572	4,956	5,504	61,985
District 4	117	86	110	37	98	138	138	119	179	178	172	192	1,564
District 5	1,862	1,467	1,711	1,625	1,953	1,857	1,844	1,917	1,775	2,007	1,739	1,799	21,556
Total	8,019	7,245	8,217	7,878	8,771	8,926	9,315	9,416	8,934	9,263	8,295	9,129	103,408
Transfers out [1]	953	1,095	1,532	1,184	1,407	1,143	1,265	1,189	1,127	1,037	825	1,049	13,806
Exports, by districts:													
District 1	1	1	1	77	----	1	134	----	1	2	3	----	221
District 2	33	32	58	75	125	115	99	91	91	103	55	86	963
District 3	1,033	977	884	823	1,077	1,080	1,270	1,456	1,185	1,669	1,151	1,562	14,167
District 4	2	1	4	1	1	2	2	2	3	2	1	----	21
District 5	304	234	332	207	337	255	567	306	508	150	482	85	3,767
Total	1,373	1,245	1,279	1,183	1,540	1,453	2,072	1,855	1,788	1,926	1,692	1,733	19,139
Stocks, by grades:													
115–145 octane	2,381	2,712	2,726	2,476	2,820	2,149	2,408	2,650	3,079	2,969	2,831	2,700	2,700
108–135 octane	246	271	233	300	311	252	337	272	385	232	368	285	285
100–130 octane	3,486	3,397	3,104	3,322	2,993	2,829	3,370	3,288	3,023	3,326	3,372	3,123	3,123
91–98 octane	899	838	860	797	792	815	624	608	719	705	694	680	680
Other grades	412	355	415	421	436	462	411	426	399	446	470	472	472
Alkylate	2,706	2,729	2,692	2,289	2,323	2,050	2,406	2,377	2,503	2,396	2,300	2,280	2,280
Stocks, by districts:													
District 1	632	740	697	710	518	619	563	748	716	679	739	752	752
District 2	2,220	2,131	2,101	1,792	2,064	1,936	2,205	2,147	2,099	2,206	2,155	2,085	2,085
District 3	5,121	5,229	5,250	5,089	4,984	4,228	4,674	4,724	5,228	4,821	4,935	4,763	4,763
District 4	144	160	134	94	120	124	132	125	119	116	132	136	136
District 5	2,013	2,042	1,848	1,920	1,989	1,650	1,982	1,877	1,946	2,252	2,074	1,804	1,804
Total	10,130	10,302	10,030	9,605	9,675	8,557	9,556	9,621	10,108	10,074	10,035	9,540	9,540

Domestic demand, all grades	4,781	4,733	5,678	5,936	5,754	7,448	4,979	6,307	5,532	6,334	5,817	6,842	70,141
Total demand, by grades:													
115–145 octane	2,255	2,524	2,945	3,271	3,032	4,525	2,571	3,158	2,977	3,402	3,336	4,132	38,128
108–135 octane	385	169	292	252	347	303	320	432	320	498	267	411	3,996
100–130 octane	2,852	2,751	2,991	2,830	3,072	3,199	3,012	3,535	3,142	3,494	3,124	3,342	37,344
91–98 octane	347	346	407	369	426	473	597	512	480	449	485	446	5,337
Other grades	203	132	180	228	303	331	401	361	323	210	184	155	3,011
Alkylate	112	56	142	169	114	70	150	164	78	207	113	89	1,464
Total demand, by districts:													
District 1	425	357	485	394	475	344	602	418	532	498	332	468	5,330
District 2	587	616	681	765	604	870	710	999	997	815	928	1,081	9,653
District 3	3,772	3,649	4,011	4,497	4,519	5,518	4,334	4,835	4,238	5,393	4,408	4,988	54,162
District 4	58	63	85	66	58	114	119	111	123	125	111	119	1,152
District 5	1,312	1,293	1,695	1,397	1,638	2,055	1,286	1,799	1,430	1,429	1,730	1,919	18,983
Total	6,154	5,978	6,957	7,119	7,294	8,901	7,051	8,162	7,320	8,260	7,509	8,575	89,280

[1] Reject material used as automotive gasoline.

TABLE 48.—Salient statistics of aviation gasoline in the United States, 1955 (total) and 1956, by months [1]

(Thousand barrels)

	1956													1955 (year)
	January	February	March	April	May	June	July	August	September	October	November	December	Total	
Production, by grades:														
115–145 octane	3,157	3,346	3,674	3,792	3,986	3,800	3,927	4,176	4,018	4,273	3,787	4,568	46,504	39,271
108–135 octane	301	327	335	289	326	273	450	460	338	289	246	145	3,779	3,977
100–130 octane	3,166	2,572	3,047	3,374	2,811	3,078	2,913	3,148	2,907	3,068	3,236	2,627	35,947	37,335
91–98 octane	488	488	530	546	553	521	541	412	430	585	434	420	5,948	5,845
Other grades	208	133	227	267	314	318	538	461	278	299	265	186	3,494	3,151
Alkylate	1,556	1,151	1,066	936	1,377	1,546	1,166	1,180	1,364	899	1,250	1,650	15,141	13,829
Production, by districts:														
District 1	552	583	384	499	514	794	601	564	485	381	389	460	6,206	6,533
District 2	1,225	1,130	1,309	1,034	1,222	1,363	1,335	1,389	1,287	1,091	1,272	1,294	14,951	11,770
District 3	5,344	4,744	5,184	5,758	5,553	5,350	5,491	5,779	5,627	5,944	5,615	5,824	66,213	61,985
District 4	185	176	180	160	140	192	199	192	197	231	193	170	2,215	1,564
District 5	1,570	1,384	1,822	1,753	1,938	1,837	1,909	1,913	1,739	1,766	1,749	1,848	21,228	21,556
Total	8,876	8,017	8,879	9,204	9,367	9,536	9,535	9,837	9,335	9,413	9,218	9,596	110,813	103,408
Transfers out [2]	978	954	974	1,171	955	1,089	1,137	1,215	1,087	1,061	1,274	1,111	13,006	13,806
Exports, by districts:														
District 1	-----	-----	70	4	2	-----	1	1	53	-----	-----	8	139	221
District 2	26	30	69	82	59	117	64	94	67	62	83	60	813	963
District 3	1,407	610	1,290	1,241	1,240	1,030	1,384	1,277	1,588	1,537	1,548	1,478	15,630	14,167
District 4	2	2	-----	1	2	4	4	3	3	2	3	1	27	21
District 5	324	265	259	174	405	216	541	273	441	242	250	167	3,557	3,767
Total	1,759	907	1,688	1,502	1,708	1,367	1,994	1,648	2,152	1,843	1,884	1,714	20,166	19,139
Stocks, by grades:														
115–145 octane	2,812	3,447	3,345	3,600	3,488	3,317	3,445	3,455	3,344	3,269	3,569	3,756	3,756	2,700
108–135 octane	258	398	318	403	393	354	389	382	289	376	306	255	255	285
100–130 octane	3,369	3,459	3,522	3,703	3,466	3,597	3,405	3,271	3,247	3,365	3,487	3,428	3,428	3,123
91–98 Octane	705	728	711	739	719	706	719	673	645	746	721	767	767	680
Other grades	471	458	429	420	442	388	489	465	390	409	432	457	457	472
Alkylate	2,793	3,006	3,113	2,934	3,073	3,597	3,639	3,673	3,766	3,460	3,266	3,772	3,772	2,280
Stocks, by districts:														
District 1	830	980	802	752	900	1,362	1,506	1,492	1,405	1,271	1,091	1,186	1,186	752
District 2	2,256	2,614	2,669	2,427	2,459	2,508	2,578	2,813	2,782	2,511	2,449	2,646	2,646	2,085
District 3	4,986	5,398	5,351	5,910	5,768	5,708	5,679	5,514	5,399	5,506	5,901	6,215	6,215	4,763
District 4	146	177	186	196	178	184	164	130	134	134	119	146	146	136
District 5	2,190	2,327	2,430	2,514	2,276	2,197	2,159	1,970	1,961	2,203	2,221	2,242	2,242	1,804
Total	10,408	11,496	11,438	11,799	11,581	11,959	12,086	11,919	11,681	11,625	11,781	12,435	12,435	9,540

Domestic demand, all grades	5,271	5,068	6,275	6,170	6,922	6,702	6,277	7,141	6,334	6,565	5,904	6,117	74,746	70,141
Total demand, by grades:														
115–145 octane	2,962	2,708	3,758	3,452	4,002	3,966	3,782	4,201	4,141	4,336	3,480	4,366	45,154	38,128
108–135 octane	328	187	415	204	335	312	415	466	461	202	316	196	3,837	3,996
100–130 octane	2,907	2,480	2,983	3,193	3,034	2,930	3,091	3,268	2,989	2,985	3,206	2,756	35,822	37,344
91–98 octane	375	323	480	458	489	458	513	375	423	452	426	271	5,043	5,337
Other grades	207	140	253	268	285	354	435	478	336	257	236	160	3,409	3,011
Alkylate	251	137	74	97	485	49	35	1	136	176	124	82	1,647	1,464
Total demand, by districts:														
District 1	422	355	474	447	333	271	420	496	526	413	466	355	4,978	5,330
District 2	835	525	1,043	887	1,087	1,036	966	895	1,000	1,099	966	711	11,050	9,653
District 3	4,552	3,859	4,785	4,815	5,173	4,952	5,056	5,363	5,296	5,411	4,833	5,074	59,169	54,162
District 4	158	118	145	138	128	145	181	195	181	195	200	120	1,904	1,152
District 5	1,063	1,118	1,516	1,385	1,909	1,665	1,648	1,840	1,483	1,290	1,323	1,571	17,811	18,983
Total	7,030	5,975	7,963	7,672	8,630	8,069	8,271	8,789	8,486	8,408	7,788	7,831	94,912	89,280

[1] Preliminary figures.
[2] Reject material used as automotive gasoline.

GASOLINE

The total gasoline demand for 1956 was 2.8 percent higher than during 1955. It must be taken into account, however, that imports of jet fuel (formerly included with gasoline imports) were handled as a separate item in 1956. The exclusion of jet fuel from gasoline imports in 1956 had the effect of reducing gasoline demand figures 0.4 percent. Gasoline exports averaged 2,000 barrels a day more than in 1955.

All figures for aviation gasoline and naphtha are included under total gasoline.

TABLE 49.—Salient statistics of gasoline in the United States, 1954 (total) and 1955, by months

(Thousand barrels)

	1955						
	January	February	March	April	May	June	July
Production:							
Finished gasoline and naphtha from crude oil	98,064	89,279	96,852	94,181	99,005	99,205	105,632
Unfinished gasoline (net)	1,355	1,145	355	−1,388	11	86	−50
Natural-gas liquids used at refineries	10,857	9,451	10,067	9,486	10,027	10,001	10,475
Sold to jobbers	3,649	3,463	3,558	3,753	3,698	3,450	3,480
Total production	113,925	103,338	110,832	106,032	112,741	112,742	119,537
Daily average	3,675	3,691	3,575	3,534	3,637	3,758	3,856
Imports	307	534	575	125	310	297	384
Exports	2,829	2,280	2,452	2,376	3,077	2,874	3,486
Daily average	91	81	79	79	99	96	112
Stocks, end of period:							
Finished gasoline	159,486	170,422	172,396	165,413	158,552	147,154	146,844
Unfinished gasoline	10,076	11,221	11,576	10,188	10,199	10,285	10,235
Total stocks	169,562	181,643	183,972	175,601	168,751	157,439	157,079
Domestic demand	97,241	89,511	106,626	112,152	116,824	121,477	116,795
Daily average	3,137	3,197	3,440	3,739	3,769	4,049	3,768

	1955						1954 total
	August	September	October	November	December	Total	
Production:							
Finished gasoline and naphtha from crude oil	105,986	100,861	104,774	102,457	108,185	1,204,481	1,115,539
Unfinished gasoline (net)	325	−602	65	−202	−435	665	−99
Natural-gas liquids used at refineries	10,643	10,614	11,903	11,379	11,479	126,382	117,549
Sold to jobbers	3,668	3,687	3,106	3,533	3,377	42,422	28,315
Total production	120,622	114,560	119,848	117,167	122,606	1,373,950	1,261,304
Daily average	3,891	3,819	3,866	3,906	3,955	3,764	3,456
Imports	258	1,063	206	537	213	4,809	1,185
Exports	3,199	3,027	3,216	2,686	3,019	34,521	34,366
Daily average	103	101	104	90	97	94	94
Stocks, end of period:							
Finished gasoline	141,352	140,236	143,080	148,050	156,047	156,047	146,679
Unfinished gasoline	10,560	9,958	10,023	9,821	9,386	9,386	8,721
Total stocks	151,912	150,194	153,103	157,871	165,433	165,433	155,400
Domestic demand	122,848	114,314	113,929	110,250	112,238	1,334,205	1,230,595
Daily average	3,963	3,810	3,675	3,675	3,621	3,655	3,371

Production.—Gasoline and naphtha produced from crude oil totaled 1,258 million barrels in 1956—a 4.5-percent increase. In addition, 166.3 million barrels of natural-gas liquids was blended in gasoline at the refineries and outside of refineries during the year.

Yields.—The high level of gasoline stocks caused refiners to maintain a lower gasoline yield from crude through most of the year. The yield for the year was 43.4 percent compared with 44.0 percent in 1955.

TABLE 50.—Salient statistics of gasoline in the United States, 1955 (total) and 1956,[1] by months

(Thousand barrels)

	1956						
	January	February	March	April	May	June	July
Production:							
Finished gasoline and naphtha from crude oil	106,593	98,608	105,339	97,609	104,671	106,047	109,642
Unfinished gasoline (net)	1,654	498	179	−982	1,444	71	−304
Natural-gas liquids used at refineries	10,883	9,507	10,240	10,092	10,323	10,273	10,863
Sold to jobbers	2,603	3,141	2,941	2,646	3,202	2,876	3,028
Total production	121,733	111,754	118,699	109,365	119,640	119,267	123,229
Daily average	3,926	3,853	3,829	3,645	3,859	3,975	3,975
Imports [2]	11	111	84	5	64	363	260
Exports	2,753	1,673	2,765	2,735	2,770	2,389	3,321
Daily average	88	57	89	91	89	79	107
Stocks, end of period:							
Finished gasoline	172,865	184,554	187,981	182,564	174,494	164,826	164,590
Unfinished gasoline	11,040	11,538	11,717	10,735	12,179	12,250	11,946
Total stocks [2]	183,905	196,092	199,698	193,299	186,673	177,076	176,536
Domestic demand	100,519	98,005	112,412	113,034	123,560	126,838	120,708
Daily average	3,242	3,379	3,626	3,767	3,985	4,227	3,893

	1956						1955 total
	August	September	October	November	December	Total	
Production:							
Finished gasoline and naphtha from crude oil	110,623	106,531	101,531	102,403	108,897	1,258,494	1,204,481
Unfinished gasoline (net)	−149	−855	548	232	895	3,231	665
Natural-gas liquids used at refineries	11,118	11,399	13,455	13,145	13,764	135,062	126,382
Sold to jobbers	3,550	2,646	1,419	1,618	1,643	31,313	42,422
Total production	125,142	119,721	116,953	117,398	125,199	1,428,100	1,373,950
Daily average	4,036	3,990	3,772	3,913	4,038	3,901	3,764
Imports	59	6	21	31	27	1,042	4,809
Exports	2,951	3,118	2,946	3,306	4,667	35,394	34,521
Daily average	95	103	95	110	150	96	94
Stocks, end of period:							
Finished gasoline	161,142	167,032	161,308	163,086	174,654	174,654	156,047
Unfinished gasoline	11,797	10,942	11,490	11,722	12,617	12,617	9,386
Total stocks	172,939	177,974	172,798	174,808	187,271	187,271	165,433
Domestic demand	125,847	111,574	119,204	112,113	108,096	1,371,910	1,334,205
Daily average	4,059	3,719	3,845	3,737	3,487	3,747	3,654

[1] Preliminary figures.
[2] New basis; excludes jet-fuel imports.

TABLE 51.—Production of gasoline in the United States in 1956, by districts and months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Gasoline from crude oil (excludes net unfinished):													
East Coast	14,424	13,064	13,335	12,195	12,246	13,089	14,520	14,751	14,039	13,831	12,718	14,626	162,838
Appalachian	2,774	2,536	2,495	2,463	2,549	2,792	2,766	2,652	2,839	2,631	2,822	2,889	32,208
Indiana, Illinois, Kentucky, etc	21,245	19,263	20,276	19,165	19,496	19,467	21,134	21,417	21,421	19,939	20,666	21,379	244,868
Minnesota, Wisconsin, etc	1,257	1,240	1,189	1,101	1,127	1,342	1,427	1,057	1,274	1,001	1,475	1,490	14,980
Oklahoma, Kansas, etc	10,845	10,072	10,259	8,154	10,455	10,843	10,943	10,237	10,191	9,764	10,123	11,083	122,969
Texas Inland	4,054	3,462	3,595	3,246	3,762	3,968	3,626	3,942	3,846	3,624	3,307	4,138	44,570
Texas Gulf Coast	24,270	22,464	24,663	24,870	25,300	25,105	25,575	25,495	23,943	23,014	22,831	23,233	290,763
Louisiana Gulf Coast	8,823	8,645	9,956	9,280	10,245	10,536	10,316	10,365	9,549	8,489	8,707	8,975	113,886
Arkansas, Louisiana Inland, etc	1,057	975	690	576	868	1,003	1,090	1,100	1,103	1,078	1,140	1,201	11,881
New Mexico	296	299	274	324	302	297	343	351	320	307	319	352	3,784
Rocky Mountain	3,787	3,509	3,813	2,925	3,533	3,974	4,036	3,912	3,634	3,471	3,819	4,023	44,436
West Coast	11,756	11,174	12,670	11,467	12,823	11,856	12,029	13,436	12,636	12,545	12,435	13,146	147,973
Total gasoline	104,588	96,703	103,215	95,766	102,706	104,272	107,805	108,715	104,795	99,694	100,362	106,535	1,235,156
Naphtha:													
East Coast	145	107	161	142	163	76	230	162	120	180	113	146	1,745
Appalachian	73	37	47	45	52	54	57	37	47	52	41	48	590
Indiana, Illinois, Kentucky, etc	297	270	326	312	361	262	335	273	284	315	379	273	3,687
Minnesota, Wisconsin, etc													
Oklahoma, Kansas, etc	191	160	186	122	123	61	65	43	48	39	90	16	1,144
Texas Inland	46	60	74	53	43	39	52	53	28	51	51	55	605
Texas Gulf Coast	752	740	891	748	721	869	666	748	731	798	852	851	9,367
Louisiana Gulf Coast	242	251	197	269	281	231	216	336	179	197	241	224	2,864
Arkansas, Louisiana Inland, etc	28	23	25	23	40	32	33	24	48	47	49	48	420
New Mexico	1	1	4	6	8	6	5	3	2	3	2	2	43
Rocky Mountain	12	7	11	15	5	4	14	7	16	7	7	9	114
West Coast	218	249	202	108	168	141	164	222	233	148	216	690	2,759
Total naphtha	2,005	1,905	2,124	1,843	1,965	1,775	1,837	1,908	1,736	1,837	2,041	2,362	23,338
Total gasoline and naphtha from crude	106,593	98,608	105,339	97,609	104,671	106,047	109,642	110,623	106,531	101,531	102,403	108,897	1,258,494
Unfinished gasoline (net):													
East Coast	103	58	135	38	314	−119	−270	158	−318	56	369	504	1,028
Appalachian	111	65	73	47	41	70	138	91	23	32	30	40	761
Indiana, Illinois, Kentucky, etc	795	−117	39	−349	107	−105	−257	98	−249	406	−343	290	315
Minnesota, Wisconsin, etc		−1	6		−3	1	1	−3	1	−1	1	−1	1
Oklahoma, Kansas, etc	221	149	−10	−104	137	−54	−64	226	−128	−82	53	10	354
Texas Inland	100	201	181	144	271	151	239	91	133	217	226	80	2,034
Texas Gulf Coast	−195	143	−198	−560	265	406	−598	−115	−179	204	−325	52	−1,100
Louisiana Gulf Coast	−36	8	−87	−64	107	−148	−41	−100	−151	−17	−28	−47	−604

Arkansas, Louisiana Inland, etc.	1	−1				−1	1			−1	1		
New Mexico													
Rocky Mountain	63	81	−20	−3	85	−26	−69	4	37	−55	78	−53	122
West Coast	491	−88	60	−131	120	−104	616	−599	−24	−211	170	20	320
Total unfinished gasoline (net)	1,654	498	179	−982	1,444	71	−304	−149	−855	548	232	895	3,231
Percent yield of gasoline and naphtha [1]	43.0	42.5	43.2	43.0	44.0	44.3	44.2	43.8	43.8	42.6	43.1	42.9	43.4
Natural-gas liquids blended at refineries	10,883	9,507	10,240	10,092	10,323	10,273	10,863	11,118	11,399	13,455	13,145	13,764	135,062
Total refinery production:													
East Coast	14,975	13,438	13,861	12,509	12,928	13,199	14,646	15,255	14,018	14,251	13,398	15,502	167,980
Appalachian	3,005	2,674	2,632	2,556	2,642	2,916	2,961	2,781	2,909	2,715	2,894	2,979	33,664
Indiana, Illinois, Kentucky, etc.	23,613	20,604	21,828	20,231	21,026	20,638	22,264	22,926	22,931	22,194	22,270	23,639	264,164
Minnesota, Wisconsin, etc.	1,282	1,259	1,208	1,118	1,137	1,368	1,446	1,078	1,290	1,017	1,497	1,510	15,210
Oklahoma, Kansas, etc.	12,620	11,582	11,547	9,226	11,714	11,995	12,110	11,640	11,234	11,091	11,370	12,346	138,475
Texas Inland	5,968	5,298	5,965	5,557	6,170	6,226	6,010	6,269	6,252	6,220	5,583	6,257	71,775
Texas Gulf Coast	27,756	25,779	27,972	27,749	29,136	29,145	28,720	29,416	27,516	27,395	26,902	27,961	335,447
Louisiana Gulf Coast	9,704	9,426	10,684	10,112	11,249	11,204	11,152	11,197	10,422	10,604	11,067	11,432	128,253
Arkansas, Louisiana Inland, etc.	1,136	1,056	748	613	932	1,084	1,176	1,177	1,204	1,189	1,265	1,323	12,903
New Mexico	356	342	335	388	359	364	404	420	391	391	401	432	4,583
Rocky Mountain	4,068	3,772	3,881	3,097	3,768	4,057	4,082	4,023	3,838	3,615	4,095	4,217	46,513
West Coast	14,647	13,383	15,097	13,563	15,377	14,195	15,230	15,410	15,070	14,852	15,038	15,958	177,820
Total 1956	119,130	108,613	115,758	106,719	116,438	116,391	120,201	121,592	117,075	115,534	115,780	123,556	1,396,787
Natural-gas liquids used in other gasoline blends [2]	2,603	3,141	2,941	2,646	3,202	2,876	3,028	3,550	2,646	1,419	1,618	1,643	31,313
Total gasoline production	121,733	111,754	118,699	109,365	119,640	119,267	123,229	125,142	119,721	116,953	117,398	125,199	1,428,100

[1] Based on crude runs to stills adjusted for net stocks of unfinished oils.

[2] This represents a net figure and includes exports.

Domestic Demand.—The domestic demand for gasoline and naphthas increased 2.8 percent in 1956. Civilian highway use of gasoline, as computed from data compiled by the Bureau of Public Roads, increased 4.9 percent to 1,162.0 million barrels. Civilian highway usage accounted for 84.7 percent of the total domestic demand for gasoline and naphtha.

No breakdown is available for the 114.5 million barrels of gasoline used by nonhighway vehicles, military motor vehicles, stationary engines, and losses.

Production and Consumption by States.—Table 52, which shows gasoline production and consumption by States, provides an indication of the areas and an approximate measure of the quantity of surplus production and deficit supply. The refinery-production data compiled by the Bureau of Mines do not include natural-gas liquids blended away from the refineries. Consumption data, by States, compiled by the American Petroleum Institute, exclude commercial naphthas and offshore military shipments. These omissions roughly offset each other.

District 1 (Atlantic Coast States and West Virginia) produced 183 million barrels of gasoline and consumed 450 million barrels in 1956, a deficit of 267 million barrels. Shipments from District 3 (228 million barrels by water and 41 million by pipeline) made up the deficit. District 2 shipped 5 million barrels of gasoline into District 1 by river barge and lake shipments and received from District 1 a like amount by pipeline. According to statistics released by the Interstate Commerce Commission, railroad shipments of gasoline into District 1 were approximately 3 million barrels in 1956.

District 2 (including refinery districts Appalachian 2 (eastern Ohio), Indiana–Illinois, Minnesota–Wisconsin, and Oklahoma–Kansas) produced 437 million barrels and consumed 482 million barrels. The deficit was offset by net receipts into the district of 29 million barrels by pipeline, 1 million by rail, and the balance by barge shipments from District 3.

District 3 (Texas, Louisiana, Arkansas, Mississippi, Alabama, and New Mexico) produced 553 million barrels—367 million in excess of consumption. This surplus was used to supply the other refining districts moving by tanker, pipeline, rail, and barge and for export.

District 4 (States in the Rocky Mountain region including New Mexico) produced 47 million barrels and consumed 39 million. Net pipeline shipments from the district were 3 million barrels and net rail shipments 1 million barrels; the balance of the surplus production was moved out of the district by truck.

District 5 (California, Oregon, Washington, Nevada, and Arizona) produced 178 million barrels, indicating a 1-million-barrel surplus. To this surplus was added 9 million barrels received in this district by pipeline from districts 3 and 4 and small receipts by tanker from the Gulf coast area. Exports from the district were 10 million barrels; about 1 million barrels was shipped from the district by rail and truck.

Method of Distribution.—Gasoline supplied 72 percent of the volume of refined petroleum products transported by pipeline. Pipeline deliveries of gasoline in 1956 were 604 million barrels, of which 107 million barrels moved beyond the originating districts to other PAW districts. Water-borne shipments of gasoline are primarily from the Gulf to the East Coast. This movement totaled 228 million in 1956. Considerable volumes were also transported by barge on the Mississippi and Ohio Rivers and within the Gulf coast ports.

TABLE 52.—Production (refinery output) and consumption of gasoline in the United States, 1954–56, by States

(Thousand barrels)

State	1954		1955		1956 [1]	
	Production [2]	Consumption [3]	Production [2]	Consumption [3]	Production [2]	Consumption [3]
Alabama	(4)	18,167	(4)	19,668	(4)	21,115
Arizona		7,778		8,564		9,295
Arkansas	10,693	11,530	10,843	12,320	11,251	13,154
California	[5] 158,858	125,151	[5] 174,417	133,713	[5] 177,820	126,991
Colorado	4,755	13,525	5,014	14,177	5,283	15,194
Connecticut		15,118		16,021		16,513
Delaware		3,088	(6)	3,426	(6)	3,703
District of Columbia		4,785		4,929		4,863
Florida		29,378	5	32,693	26	36,516
Georgia	[7] 8,709	24,348	[7] 6,984	26,291	[7] 9,597	27,842
Idaho	(8)	5,694	(8)	5,949	(8)	6,082
Illinois	[9] 98,400	62,731	[9] 109,183	64,753	105,065	67,005
Indiana	68,356	36,320	67,556	39,076	65,997	40,898
Iowa		25,354		26,372		26,632
Kansas	[10] 62,169	23,259	[10] 69,085	24,474	[10] 52,408	24,752
Kentucky	[11] 11,580	17,285	[11] 11,049	18,544	[11] 12,673	19,470
Louisiana	[4] 104,153	17,572	[4] 122,245	19,961	[4] 129,905	20,872
Maine		6,554		6,966		7,133
Maryland	(7)	16,885	(7)	18,300	(7)	19,525
Massachusetts	[6] 4,979	26,752	[6] 5,312	28,892	[6] 7,163	30,141
Michigan	16,140	53,928	17,894	58,251	19,502	59,179
Minnesota	(9)	26,001	(9)	27,436	[12] 7,399	28,625
Mississippi	(4)	12,955	(4)	13,806	(4)	14,525
Missouri	(10)	34,907	(10)	36,767	[13] 12,255	38,140
Montana	8,637	6,367	8,967	6,580	9,621	6,929
Nebraska	(10)	13,094	(10)	13,530	(10)	13,548
Nevada		2,677		2,973		3,074
New Hampshire		3,848		4,100		4,396
New Jersey	56,394	39,942	52,808	43,010	54,286	43,955
New Mexico	4,150	7,414	4,090	8,008	4,583	9,265
New York	13,927	78,392	14,444	83,714	14,668	88,334
North Carolina		27,369		29,861		31,235
North Dakota	(10)	7,075	(10)	7,200	[14] 7,811	7,250
Ohio	68,212	64,501	75,377	69,378	79,866	73,109
Oklahoma	63,591	19,637	72,178	21,916	73,812	22,469
Oregon		14,024		14,769		15,267
Pennsylvania	85,818	63,422	93,581	67,774	95,984	71,172
Rhode Island	(6)	5,175	(6)	5,558	(6)	5,591
South Carolina	(7)	14,058	(7)	14,936	(7)	15,813
South Dakota		7,693		7,830		7,777
Tennessee	(11)	21,954	(11)	23,233	(11)	24,690
Texas	353,317	106,245	380,474	105,672	407,222	107,045
Utah	12,963	6,385	13,115	7,000	15,085	7,210
Vermont		2,718		2,833		2,898
Virginia		25,256		26,842	(7)	28,545
Washington	(5)	19,232	(5)	20,690	(5)	22,176
West Virginia	1,490	10,253	841	10,985	981	11,491
Wisconsin	(9)	27,255	(9)	28,292	(9)	28,909
Wyoming	[8] 15,698	3,785	[8] 16,066	3,862	[8] 16,524	3,900
Total	1,232,989	1,216,836	1,331,528	[15] 1,291,895	1,396,787	1,334,213

[1] Preliminary figures.
[2] Excludes jet fuel.
[3] American Petroleum Institute.
[4] Alabama and Mississippi included with Louisiana.
[5] Washington included with California.
[6] Delaware and Rhode Island included with Massachusetts.
[7] Maryland, South Carolina, and Virginia included with Georgia.
[8] Idaho included with Wyoming.
[9] Minnesota and Wisconsin included with Illinois.
[10] Missouri, Nebraska, and North Dakota included with Kansas.
[11] Tennessee included with Kentucky.
[12] Formerly included with Illinois and now included with North Dakota.
[13] Formerly included with Kansas; now includes Nebraska.
[14] Formerly included with Kansas; now includes Wisconsin.
[15] Revised.

TABLE 53.—Transportation of petroleum products by pipeline in 1955–56, by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1955													
Turned into lines:[1]													
Gasoline	41, 100	38, 512	44, 900	45, 313	47, 456	47, 564	47, 447	49, 353	48, 748	47, 395	47, 340	46, 768	551, 896
Kerosine	4, 600	3, 747	3, 193	2, 252	1, 711	1, 891	1, 707	2, 378	2, 454	3, 172	4, 156	5, 102	36, 363
Distillate fuel oil	19, 065	16, 793	14, 604	11, 408	10, 079	10, 313	10, 536	11, 532	11, 606	13, 007	15, 612	21, 711	166, 266
Liquefied petroleum gases	797	611	591	429	444	371	322	465	547	514	645	937	6, 673
Delivered from lines:[1]													
Gasoline	40, 321	37, 061	44, 757	45, 698	47, 418	47, 892	47, 303	49, 924	48, 425	48, 103	46, 570	47, 333	550, 805
Kerosine	4, 892	4, 080	3, 206	2, 090	1, 745	1, 650	1, 523	2, 068	2, 342	3, 244	3, 834	5, 097	35, 771
Distillate fuel oil	19, 904	18, 102	16, 266	9, 975	8, 828	8, 995	9, 622	9, 826	11, 438	12, 258	16, 342	23, 547	165, 103
Liquefied petroleum gases	815	709	497	397	362	334	319	390	522	427	595	1, 011	6, 378
Shortage (over overage):[2]													
Gasoline	3	(19)	25	(19)	(32)	13	45	97	(47)	168	6	(159)	81
Kerosine	87	46	55	55	46	51	55	51	50	72	74	94	736
Distillate fuel oil	(4)	30	10	14	(4)	(7)	13	22	10	19	17	4	124
Liquefied petroleum gases	29	30	37	22	28	19	14	16	31	26	33	52	337
Stocks in lines and working tanks at end of month:													
Gasoline	18, 784	20, 254	20, 372	20, 006	20, 076	19, 735	19, 834	19, 166	19, 536	18, 660	19, 424	19, 018	19, 018
Kerosine	1, 774	1, 395	1, 327	1, 434	1, 354	1, 544	1, 673	1, 932	1, 994	1, 850	2, 098	2, 009	2, 009
Distillate fuel oil	8, 946	7, 607	5, 935	7, 354	8, 609	9, 934	10, 835	12, 519	12, 677	13, 407	12, 660	10, 820	10, 820
Liquefied petroleum gases	457	329	386	396	450	468	457	516	510	571	588	462	462
1956													
Turned into lines:[1]													
Gasoline	45, 839	44, 731	49, 848	50, 096	54, 410	53, 119	53, 307	53, 272	50, 216	51, 482	50, 393	49, 614	606, 327
Kerosine	5, 126	3, 828	3, 140	2, 476	1, 962	2, 209	2, 065	2, 571	3, 109	4, 112	3, 744	4, 477	38, 819
Distillate fuel oil	22, 636	18, 778	15, 863	12, 499	12, 142	12, 288	13, 476	15, 549	14, 027	15, 612	16, 817	23, 014	192, 701
Liquefied petroleum gases	870	838	1, 037	923	924	825	915	1, 118	1, 229	1, 057	1, 143	1, 666	12, 545
Delivered from lines:[1]													
Gasoline	45, 397	42, 564	49, 079	49, 519	54, 606	54, 136	52. 598	53, 686	50, 140	52, 724	50, 239	49, 534	604, 222
Kerosine	4, 849	4, 532	3, 238	2, 296	2, 016	1, 984	1, 785	2, 297	2, 702	3, 733	3, 497	4, 363	37, 292
Distillate fuel oil	23, 651	20, 242	16, 990	12, 979	11, 067	10, 792	12, 017	13, 474	13, 523	15, 246	16, 521	23, 559	190, 061
Liquefied petroleum gases	806	888	749	911	794	746	833	1, 098	1, 189	1, 036	1, 155	1, 456	11, 661
Shortage (or overage):[2]													
Gasoline	55	226	(101)	(57)	137	103	205	(90)	215	(29)	151	(79)	736
Kerosine	129	80	78	42	73	57	56	54	62	86	80	85	882
Distillate fuel oil	(1)	9	(14)	11	(16)	10	13	13	23	9	26	14	97
Liquefied petroleum gases	51	52	51	23	23	1	7	(15)	25	27	69	71	385
Stocks in lines and working tanks at end of month:													
Gasoline	19, 405	21, 346	22, 216	22, 850	22, 517	21, 397	21, 901	21, 577	21, 438	20, 225	20, 228	20, 387	20, 387
Kerosine	2, 157	1, 373	1, 197	1, 335	1, 208	1, 376	1, 600	1, 820	2, 165	2, 458	2, 625	2, 654	2, 654
Distillate fuel oil	9, 806	8, 333	7, 220	6, 729	7, 820	9, 306	10, 752	12, 814	13, 295	13, 652	13, 922	13, 363	13, 363
Liquefied petroleum gases	475	373	610	599	706	784	859	894	909	903	822	961	961

[1] The quantities "Turned into lines" and "Delivered from lines" are on a net basis eliminating intersystem transfers, and are not comparable with data published for previous years.

[2] Figures in parentheses represent overage.

TABLE 54.—Transportation of petroleum products by pipeline between PAW districts in the United States in 1955–56, by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1955													
From district 1 to district 2:													
Gasoline	241	211	170	184	153	259	346	300	372	456	388	409	3, 489
Kerosine	5	----	5	4	----	5	5	----	----	12	----	5	41
Distillate fuel oil	15	16	27	10	15	15	12	----	----	----	12	14	136
From district 2 to district 3:													
Gasoline	439	477	440	667	545	317	730	395	331	899	936	704	6, 880
Kerosine	----	----	----	----	----	----	----	----	----	----	----	----	----
Distillate fuel oil	316	463	239	146	150	194	135	190	178	183	331	482	3, 007
From district 3 to district 1:													
Gasoline	2, 719	2, 883	3, 217	3, 183	3, 176	3, 306	3, 395	3, 486	3, 111	3, 298	3, 427	3, 325	38, 526
Kerosine	1, 227	985	641	370	373	305	486	648	553	972	888	952	8, 400
Distillate fuel oil	1, 167	911	1, 106	544	575	563	875	714	923	868	735	1, 013	9, 994
From district 3 to district 2:													
Gasoline	3, 000	2, 020	2, 444	2, 792	1, 069	2, 837	2, 610	2, 769	2, 890	3, 289	2, 785	2, 218	30, 723
Kerosine	157	123	85	27	53	29	2	79	74	82	178	218	1, 107
Distillate fuel oil	1, 226	1, 029	644	652	282	216	416	400	526	501	748	1, 155	7, 795
From district 3 to district 4:													
Gasoline	261	278	285	297	299	295	334	328	284	319	261	230	3, 471
Kerosine	21	22	21	18	7	8	7	4	9	16	18	21	172
Distillate fuel oil	12	15	17	19	26	20	17	23	17	18	18	17	219
From district 4 to district 5:													
Gasoline	363	323	342	367	362	366	365	371	398	334	387	445	4, 423
Kerosine	----	----	----	----	----	----	----	----	----	----	----	----	----
Distillate fuel oil	264	241	244	248	199	216	189	179	279	308	339	318	3, 024
1956													
From district 1 to district 2:													
Gasoline	398	293	403	439	453	462	487	488	394	459	415	439	5, 130
Kerosine	3	4	5	9	7	3	6	11	15	6	----	3	72
Distillate fuel oil	9	20	21	25	17	47	34	----	44	23	12	20	272
From district 2 to district 3:													
Gasoline	708	787	942	1, 119	1, 085	1, 231	1, 137	1, 086	1, 088	901	1, 068	851	12, 003
Kerosine	----	----	----	----	----	----	----	----	----	----	----	----	----
Distillate fuel oil	538	347	359	299	250	347	509	501	554	734	479	579	5, 496
From district 3 to district 1:													
Gasoline	3, 064	2, 906	3, 590	3, 426	3, 734	3, 549	3, 595	3, 919	3, 467	3, 322	3, 335	3, 351	41, 258
Kerosine	1, 218	1, 128	506	422	412	392	484	517	865	947	787	1, 137	8, 815
Distillate fuel oil	1, 205	1, 112	937	629	729	778	1, 001	826	711	956	921	1, 000	10, 805

TABLE 54.—Transportation of petroleum products by pipeline between PAW districts in the United States in 1955–56, by months—Con.

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1956													
From district 3 to district 2:													
Gasoline	2,283	2,581	2,967	3,084	3,340	3,318	3,330	3,120	2,845	3,221	3,083	2,560	35,732
Kerosine	187	169	64	117	34	59	122	31	79	100	112	176	1,250
Distillate fuel oil	1,214	891	747	463	538	462	413	671	451	858	783	989	8,480
From district 3 to district 4:													
Gasoline	318	254	286	298	299	309	303	298	317	273	195	277	3,427
Kerosine	22	23	19	16	14	5	6	5	5	20	14	22	171
Distillate fuel oil	30	10	19	20	21	13	29	18	17	41	37	59	314
From district 3 to district 5:													
Gasoline	165	113	309	293	337	284	294	314	248	282	401	400	3,440
Kerosine													
Distillate fuel oil	10		10	10	32	14	28	23	34	34	26	32	253
From district 4 to district 5:													
Gasoline	346	433	383	480	600	472	527	543	553	524	497	460	5,818
Kerosine													
Distillate fuel oil	376	311	346	317	225	248	330	295	299	360	346	483	3,936

Stocks.—Stocks of finished gasoline, as reported, include those held at refineries, at bulk terminals, and by pipelines but do not include those held by secondary distributors, consumers, or in military custody. The Bureau of Mines definition of a bulk-terminal installation is any storage facility that receives its principal products by

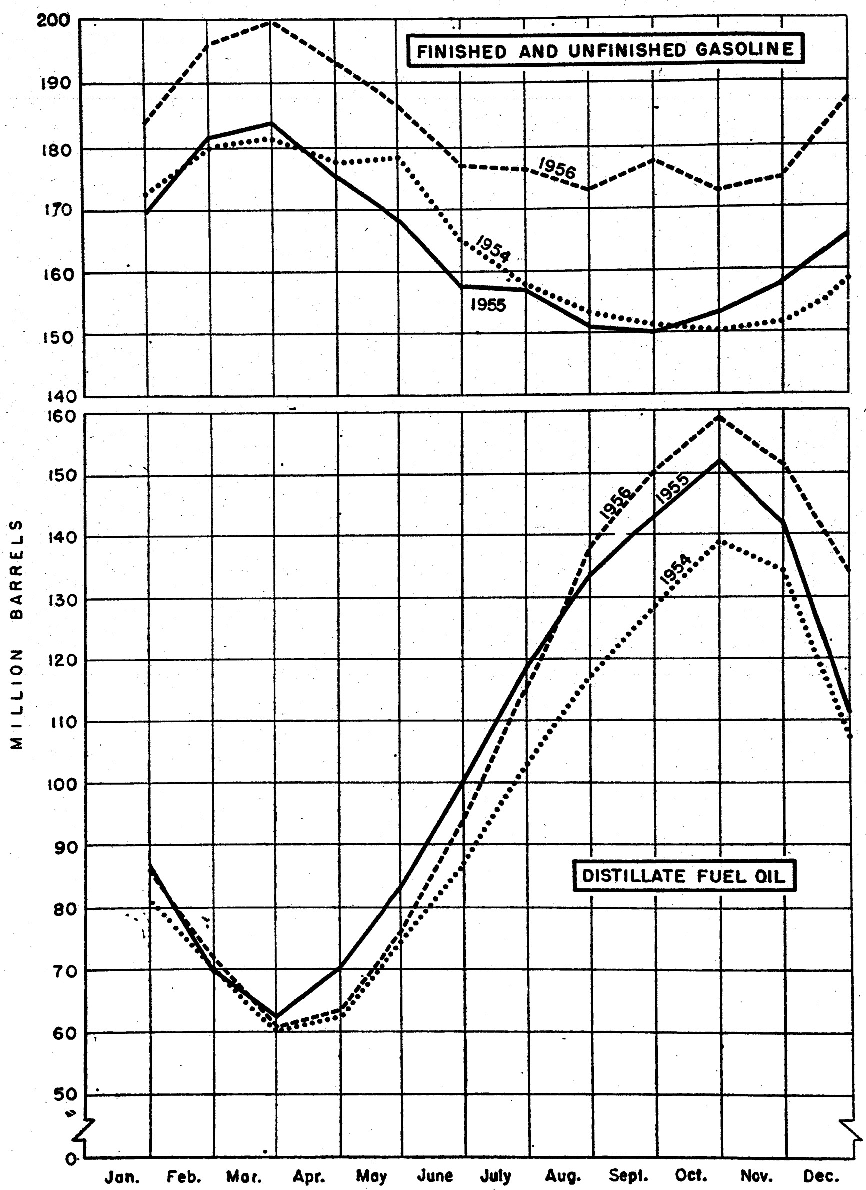

FIGURE 9.—Stocks of finished and unfinished gasoline (excluding jet) and stocks of distillate fuel oil (excluding jet) in the United States, 1954–56 by months.

TABLE 55.—Stocks of gasoline in the United States in 1956, by district and month

(Thousand barrels)

	Jan. 31	Feb. 29	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Finished gasoline: [1]												
East Coast	34,707	36,581	39,445	39,585	39,446	38,075	38,750	39,415	42,322	40,039	38,056	37,985
Appalachian	7,146	7,465	7,764	7,733	7,313	7,013	7,250	6,960	7,361	6,306	6,463	7,316
Indiana, Illinois, Kentucky, etc	31,938	34,656	36,515	35,665	32,836	30,202	29,597	29,287	30,010	28,350	28,753	31,440
Minnesota, Wisconsin, North Dakota, and South Dakota	6,569	6,533	6,600	6,060	6,523	6,370	6,844	5,792	6,412	6,512	6,955	7,289
Oklahoma, Kansas, etc	18,755	20,406	20,029	18,394	16,700	15,004	15,241	14,689	14,852	13,883	14,690	16,769
Texas Inland	7,043	7,454	7,373	6,704	6,508	6,563	6,418	6,655	7,063	7,060	6,464	7,187
Texas Gulf Coast	23,218	25,962	23,588	23,455	21,177	20,040	20,203	19,429	20,167	20,866	21,245	21,955
Louisiana Gulf Coast	10,015	9,731	10,232	9,798	9,398	9,626	9,507	9,622	9,164	9,680	11,016	12,252
Arkansas, Louisiana Inland, etc	4,432	5,106	4,536	4,155	4,393	4,207	4,588	4,780	5,058	4,308	4,526	4,769
New Mexico	357	437	448	505	444	441	419	408	416	390	360	378
Other Rocky Mountain	6,684	7,511	8,047	7,443	7,015	6,434	5,917	4,945	4,640	4,310	4,654	5,699
West Coast	22,001	22,712	23,404	23,067	22,741	20,851	19,856	19,160	19,567	19,604	19,904	21,615
Total finished gasoline	172,865	184,554	187,981	182,564	174,494	164,826	164,590	161,142	167,032	161,308	163,086	174,654
Unfinished gasoline:												
East Coast	1,128	1,196	1,356	1,421	1,748	1,616	1,363	1,509	1,223	1,272	1,642	2,240
Appalachian	232	230	208	190	182	190	254	274	220	204	180	178
Indiana, Illinois, Kentucky, etc	1,735	1,685	1,819	1,535	1,691	1,648	1,465	1,634	1,462	1,916	1,627	1,959
Minnesota, Wisconsin, North Dakota, and South Dakota	1		6	6	3	4	5	2	3	2	3	2
Oklahoma, Kansas, etc	350	499	489	385	522	468	404	630	502	420	473	483
Texas Inland	230	298	318	306	355	289	344	287	263	516	347	252
Texas Gulf Coast	4,158	4,419	4,312	3,852	4,257	4,840	4,329	4,280	4,141	4,224	4,207	4,280
Louisiana Gulf Coast	527	540	498	463	639	544	583	577	511	586	644	657
Arkansas, Louisiana Inland, etc	2	1	1	1	1		1	1	1		1	1
New Mexico												
Other Rocky Mountain	197	278	258	255	340	314	245	249	286	231	309	256
West Coast	2,480	2,392	2,452	2,321	2,441	2,337	2,953	2,354	2,330	2,119	2,289	2,309
Total unfinished gasoline	11,040	11,538	11,717	10,735	12,179	12,250	11,946	11,797	10,942	11,490	11,722	12,617
Total finished and unfinished gasoline:												
East Coast	35,835	37,777	40,801	41,006	41,194	39,691	40,113	40,924	43,545	41,311	39,698	40,225
Appalachian	7,378	7,695	7,972	7,923	7,495	7,203	7,504	7,234	7,581	6,510	6,643	7,494
Indiana, Illinois, Kentucky, etc	33,673	36,341	38,334	37,200	34,527	31,850	31,062	30,921	31,472	30,266	30,380	33,399
Minnesota, Wisconsin, North Dakota, and South Dakota	6,570	6,533	6,606	6,066	6,526	6,374	6,849	5,794	6,415	6,514	6,958	7,291
Oklahoma, Kansas, etc	19,105	20,905	20,518	18,779	17,222	15,472	15,645	15,319	15,354	14,303	15,163	17,252
Texas Inland	7,273	7,752	7,691	7,010	6,863	6,852	6,762	6,942	7,326	7,576	6,811	7,439
Texas Gulf Coast	27,376	30,381	27,900	27,307	25,434	24,880	24,532	23,709	24,308	25,090	25,452	26,235
Louisiana Gulf Coast	10,542	10,271	10,730	10,261	10,037	10,170	10,090	10,199	9,675	10,266	11,660	12,909
Arkansas, Louisiana Inland, etc	4,434	5,107	4,537	4,156	4,394	4,207	4,589	4,781	5,059	4,308	4,527	4,770
New Mexico	357	437	448	505	444	441	419	408	416	390	360	378
Other Rocky Mountain	6,881	7,789	8,305	7,698	7,355	6,748	6,162	5,194	4,926	4,541	4,963	5,955
West Coast	24,481	25,104	25,856	25,388	25,182	23,188	22,809	21,514	21,897	21,723	22,193	23,924
Total: 1956	183,905	196,092	199,698	193,299	186,673	177,076	176,536	172,939	177,974	172,798	174,808	187,271
1955	169,562	181,643	183,972	175,601	168,751	157,439	157,079	151,912	150,194	153,103	157,871	165,433

[1] Includes stocks of finished gasoline at refineries and bulk terminals, and in pipelines (excluding jet fuel).

tanker, barge, or pipeline or any storage point with a combined capacity for storing gasoline, kerosine, distillate fuel oil, residual fuel oil, or jet fuels of 50,000 barrels or more, regardless of transportation means by which products are received.

There are definite normal seasonal variations in gasoline storage because of a summer peak and a winter low in gasoline demand. These stocks build up in winter, although refinery yields are lower, and decrease sharply during the summer months. This variation in stocks makes unnecessary large variations in seasonal yields of gasoline from crude oil. Distillate fuel oil follows the exact reverse of this pattern, as demand is high in winter and low in summer.

Total stocks of gasoline increased 22 million barrels in 1956. At the end of the first quarter stocks were 16 million barrels above those in the previous year and, with higher refinery runs and a smaller gain in gasoline demand than was anticipated, remained above normal throughout the year. The days supply of gasoline stocks at the end of 1956 was 3.1 days higher than at the close of 1955.

Prices.—The average dealer net price for Regular Grade gasoline (exclusive of dealers' margin and sales tax) in 50 representative cities in the United States provides an index of wholesale gasoline prices. The average service-station price (excluding taxes) increased 0.20 cent per gallon in 1956 to 21.62 cents. Total taxes increased from 7.65 cents per gallon in 1955 to 8.30 cents in 1956. The federal tax was increased from 2 cents to 3 cents per gallon in July 1956.

TABLE 56.—Days' supply of gasoline on hand in the United States at end of month, 1954–56 [1]

	1954			1955			1956 [2]		
	Finished and unfinished	Natural gasoline	Total gasoline	Finished and unfinished	Natural gasoline	Total gasoline	Finished and unfinished	Natural gasoline	Total gasoline
January	54.3	3.3	57.6	51.7	4.0	55.7	53.5	3.4	56.9
February	54.4	3.2	57.6	51.6	3.4	55.0	52.8	3.1	55.9
March	51.3	3.2	54.5	48.1	3.4	51.5	51.7	3.3	55.0
April	51.4	3.6	55.0	45.4	3.5	48.9	47.4	3.5	50.9
May	45.8	3.6	49.4	40.7	3.6	44.3	43.3	3.9	47.2
June	44.7	4.0	48.7	40.6	4.2	44.8	44.3	4.9	49.2
July	43.5	4.3	47.8	38.6	4.3	42.9	42.5	5.2	47.7
August	43.0	4.3	47.3	38.8	4.6	43.4	45.2	5.8	51.0
September	43.3	4.4	47.7	39.7	4.7	44.4	45.2	6.0	51.2
October	43.1	4.5	47.6	40.7	4.8	45.5	44.9	6.3	51.2
November	43.9	4.4	48.3	42.5	4.4	46.9	48.1	6.3	54.4
December	48.1	4.4	52.5	49.6	4.1	53.7	51.2	5.6	56.8

[1] Stocks divided by daily average total demand (domestic plus exports) for succeeding month.
[2] Preliminary figures.

KEROSINE

The overall demand for kerosine remained about the same as in 1955. Both domestic demand and exports showed little change from the previous year. Production of kerosine, including that at natural-gasoline plants, was 5 percent higher in 1956 than in 1955. Consequently, stocks of kerosine at the close of the year were increased 5 million barrels.

TABLE 57.—Average monthly prices of gasoline in the United States, 1955–56, in cents per gallon

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average for year
1955													
Monthly average at refineries in Oklahoma, regular, 86 octane [1]	10.81	10.81	10.81	10.87	11.00	11.00	11.03	11.25	11.25	11.25	11.25	11.25	11.05
Average of 50 cities on 1st of month: [2]													
Dealer's net (excluding tax)	15.91	16.00	16.05	16.24	16.26	16.37	16.33	16.33	16.22	16.26	16.11	16.03	16.18
Service station (including State, local, and Federal taxes)	28.76	28.63	28.68	28.96	29.11	29.05	29.20	29.68	29.51	29.23	29.06	29.00	29.07
1956													
Monthly average at refineries in Oklahoma, regular, 88 octane [1]	11.25	11.25	11.33	11.38	11.73	11.88	11.88	11.88	11.88	11.76	11.63	11.63	11.62
Average of 50 cities on 1st of month: [2]													
Dealer's net (excluding tax)	16.32	16.24	16.31	16.42	16.41	16.60	16.34	16.46	16.30	16.40	16.17	16.15	16.34
Service station (including State, local, and Federal taxes)	29.44	29.24	29.12	29.23	29.28	29.56	30.63	30.80	30.43	30.62	30.46	30.33	29.93

[1] Platt's Oil Price Handbook.

[2] Platt's Oilgram Price Service.

TABLE 58.—Salient statistics of kerosine in the United States, 1955–56, by months and districts

(Thousand barrels)

Month and district	Production		Yield (percent)		Transfers from gasoline plants		Imports		Exports		Domestic demand		Stocks, end of period	
	1955	1956 [1]	1955	1956 [1]	1955	1956 [1]	1955	1956 [1]	1955	1956 [1]	1955	1956 [1]	1955	1956 [1]
Month:														
January	12,431	11,940	5.4	4.7	234	245			232	219	16,993	17,426	23,266	21,310
February	10,286	11,165	4.8	4.8	185	173			392	106	15,054	13,830	18,291	18,712
March	10,866	10,590	4.7	4.3	214	147			234	94	10,950	12,140	18,187	17,215
April	9,258	8,978	4.4	4.0	115	203			309	209	5,765	7,960	21,486	18,227
May	9,065	9,058	4.0	3.7	99	138			341	370	3,934	5,170	26,375	21,883
June	7,923	8,704	3.5	3.6	161	105			309	217	4,320	4,364	29,830	26,111
July	8,767	9,170	3.7	3.7	110	135			442	213	5,516	6,213	32,749	28,990
August	8,797	9,716	3.7	3.9	178	108			420	138	6,012	6,850	35,292	31,826
September	8,270	9,872	3.7	4.1	93	125			187	84	7,107	8,151	36,361	33,588
October	9,391	11,044	4.0	4.6	175	144			175	395	9,047	8,714	36,705	35,667
November	10,055	11,508	4.3	4.8	174	107		1	148	594	13,503	12,360	33,283	34,329
December	12,028	11,735	4.9	4.6	212	151			146	681	18,607	14,114	26,770	31,420
Total	117,137	123,480	4.3	4.2	1,950	1,781		1	3,335	3,320	116,808	117,292	26,770	31,420
District:														
East Coast	11,290	13,125	2.9	3.1									11,060	12,979
Appalachian	3,424	3,778	4.8	5.0									1,101	1,089
Indiana, Illinois, Kentucky, etc	25,417	27,517	5.1	5.4									6,084	7,037
Minnesota, Wisconsin, North Dakota, etc	(2)	2,405	(2)	7.6									(2)	1,270
Oklahoma, Kansas, etc	6,488	5,648	2.6	2.3									1,277	1,371
Texas Inland	2,764	2,986	3.0	3.0	658	723	(2)	(2)	(2)	(2)	(2)	(2)	438	620
Texas Gulf Coast	41,753	41,948	6.3	5.9	652	589							3,105	2,846
Louisiana Gulf Coast	20,035	20,081	8.2	7.7	156	240							2,428	2,285
Arkansas, Louisiana Inland, etc	2,480	2,545	7.3	7.3	484	229							607	1,179
Rocky Mountain	1,563	1,632	1.6	1.5									282	440
California	1,923	1,815	.5	.4									388	304
Total	117,137	123,480	4.3	4.2	1,950	1,781		1	3,335	3,320	116,808	117,292	26,770	31,420

[1] Preliminary figures

[2] Not available.

TABLE 59.—Sales of kerosine in the United States, 1955–56, by districts, States, and uses

(Thousand barrels)

District [1] and State	Sold as range oil		Tractor fuel		All other uses		Total	
	1955	1956	1955	1956	1955	1956	1955	1956
District 1:								
Connecticut	4,583	4,382	11	8	379	377	4,973	4,767
Delaware	622	676	9	3	63	59	694	738
District of Columbia	172	188	3	3	72	61	247	252
Florida	1,803	1,889	110	92	760	811	2,673	2,792
Georgia	1,836	1,888	205	192	549	627	2,590	2,707
Maine	3,113	2,991	24	18	225	208	3,362	3,217
Maryland	1,581	1,564	101	85	498	541	2,180	2,190
Massachusetts	10,838	9,932	32	31	850	807	11,720	10,770
New Hampshire	1,362	1,472	8	6	50	42	1,420	1,520
New Jersey	3,769	3,702	22	17	1,407	1,559	5,198	5,278
New York	7,914	8,175	146	128	831	731	8,891	9,034
North Carolina	7,918	8,832	49	52	3,388	3,742	11,355	12,626
Pennsylvania	2,248	2,348	111	95	1,277	1,296	3,636	3,739
Rhode Island	2,498	2,714	34	26	77	67	2,609	2,807
South Carolina	3,289	3,861	37	36	1,276	1,356	4,602	5,253
Vermont	559	579	21	16	41	37	621	632
Virginia	2,393	2,417	22	20	875	858	3,290	3,295
West Virginia	197	121	6	3	126	110	329	234
Total	56,695	57,731	951	831	12,744	13,289	70,390	71,851
District 2:								
Illinois	3,239	3,407	203	196	1,321	1,207	4,763	4,810
Indiana	2,320	2,241	61	54	1,599	1,457	3,980	3,752
Iowa	1,694	1,635	202	191	749	717	2,645	2,543
Kansas	668	859	84	72	225	213	977	1,144
Kentucky	681	828	64	44	446	344	1,191	1,216
Michigan	3,608	3,372	86	52	1,584	1,469	5,278	4,893
Minnesota	1,665	1,981	15	11	573	487	2,253	2,479
Missouri	1,644	1,857	24	33	572	592	2,240	2,482
Nebraska	736	681	42	31	144	148	922	860
North Dakota	608	887	45	41	115	90	768	1,018
Ohio	1,523	1,636	75	65	715	651	2,313	2,352
Oklahoma	657	506	108	90	649	590	1,414	1,186
South Dakota	483	422	36	31	52	60	571	513
Tennessee	1,581	1,643	56	50	574	524	2,211	2,217
Wisconsin	1,688	1,538	60	62	793	747	2,541	2,347
Total	22,795	23,493	1,161	1,023	10,111	9,296	34,067	33,812
District 3:								
Alabama	892	768	122	127	586	493	1,600	1,388
Arkansas	606	702	117	103	493	484	1,216	1,289
Louisiana	571	643	103	57	554	507	1,228	1,207
Mississippi	452	521	76	85	565	650	1,093	1,256
New Mexico	163	188	11	18	53	52	227	258
Texas	1,594	1,464	230	208	2,079	2,042	3,903	3,714
Total	4,278	4,286	659	598	4,330	4,228	9,267	9,112
District 4:								
Colorado	197	205	15	5	44	24	256	234
Idaho	21	20	2	1	27	25	50	46
Montana	148	160	11	5	56	48	215	213
Utah	26	26	2	1	12	9	40	36
Wyoming	70	41	3	1	115	96	188	138
Total	462	452	33	13	254	202	749	667
District 5:								
Arizona	2				55	38	57	38
California	90	82			1,080	1,090	1,170	1,172
Nevada					1		1	
Oregon	5	3			73	73	78	76
Washington	4	3			97	103	101	106
Total	101	88			1,306	1,304	1,407	1,392
Total United States	84,331	86,050	2,804	2,465	28,745	28,319	115,880	116,834

[1] States are grouped according to petroleum-marketing districts rather than conventional geographic regions.

According to a Bureau of Mines survey, kerosine sales gained less than 1 percent compared with a 2-percent decrease in 1955. Kerosine, used for range oil, which accounts for three-fourths of the market demand, increased 2 percent. Sales of kerosine for other uses were lower by approximately 2 percent in 1956. Kerosine sold for tractor fuel continued the pronounced downward trend evident in recent years, as more gasoline and liquefied-petroleum gases were used for this purpose.

TABLE 60.—Sales of range oil[1] in the United States, 1954–56, by States

(Thousand barrels)

State	1954	1955	1956	
			Total	Percent of United States total
Massachusetts	11,610	11,556	10,634	10.3
North Carolina	8,179	8,180	9,124	8.8
New York	8,466	8,508	8,784	8.5
Illinois	6,241	6,149	6,275	6.0
Michigan	6,217	6,248	6,003	5.8
Connecticut	4,857	4,849	4,703	4.5
South Carolina	3,334	3,400	4,013	3.9
New Jersey	4,071	4,065	3,927	3.8
Indiana	3,225	3,330	3,257	3.1
Maine	3,174	3,341	3,222	3.1
Wisconsin	3,126	3,320	3,222	3.1
Minnesota	2,630	2,698	3,102	3.0
Rhode Island	2,531	2,601	2,816	2.7
Pennsylvania	2,533	2,642	2,699	2.6
Missouri	2,406	2,462	2,673	2.6
Iowa	2,278	2,754	2,669	2.6
Virginia	2,409	2,484	2,541	2.5
Ohio	2,209	2,166	2,218	2.1
Georgia	1,981	1,931	1,993	1.9
Florida	1,900	1,881	1,977	1.9
Texas	1,963	1,941	1,813	1.8
Tennessee	1,732	1,650	1,709	1.7
Maryland	1,549	1,639	1,615	1.6
New Hampshire	1,432	1,457	1,592	1.5
Kentucky	1,078	1,080	1,214	1.2
Kansas	893	828	1,004	1.0
North Dakota	716	742	1,001	1.0
All Other	8,061	7,803	7,685	7.4
Total	100,801	101,705	103,485	100.0

[1] Includes mostly kerosine and also a small quantity of No. 1 fuel oil.

The average quotations for representative kerosine prices were fractionally higher in 1956 than in 1955.

Shipments of kerosine by rail and truck from district 5 to other Western States are unimportant in volume; however, the quantity increased from 9,000 barrels in 1955 to 13,000 in 1956. Receipts into the area, including imports, declined from 31,000 barrels in 1955 to 26,000 in 1956.

Kerosine moved by tanker and barge from the Gulf Coast area to east coast terminals increased from 43.8 million barrels in 1955 to 45.6 million in 1956, a gain of 4 percent. The quantities loaded at Texas ports were 33.4 million barrels in 1955 and 35.4 million in 1956; the amounts from Louisiana were 10.4 million barrels in 1955 and 10.3 million in 1956.

Kerosine shipments by barge from the Gulf coast and Arkansas to terminals on the Mississippi River and its tributaries increased

TABLE 61.—Monthly average prices of kerosine in the United States, 1955–56, in cents per gallon

[Platt's Oil Price Handbook]

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1955													
41°–43° gravity, water-white kerosine at refineries, Oklahoma	9.69	9.69	9.69	9.69	9.69	9.67	9.50	9.40	9.38	9.41	9.50	9.69	9.58
Kerosine (and/or No. 1 fuel oil) at New York Harbor	10.95	10.95	10.95	10.89	10.80	10.80	10.80	10.80	10.80	10.55	10.60	10.80	10.81
Kerosine, tank-wagon at Chicago	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.72	16.61
Kerosine, tank-wagon at New York City [1]	14.95	14.95	14.95	14.95	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.85
1956													
41°–43° gravity, water-white kerosine at refineries, Oklahoma	10.21	10.37	10.38	10.23	10.13	10.13	10.13	10.13	10.13	10.13	10.13	10.19	10.19
Kerosine (and/or No. 1 fuel oil) at New York Harbor	11.04	11.10	11.10	11.10	11.10	11.10	11.10	11.10	11.10	11.47	11.50	11.50	11.19
Kerosine, tank-wagon at Chicago	17.00	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10
Kerosine, tank-wagon at New York City [1]	15.00	15.20	15.30	15.30	15.30	15.30	15.30	15.30	15.30	15.80	15.80	15.80	15.40

[1] Manhattan and Queens.

from 4.2 million barrels in 1955 to 4.5 million in 1956. This gain contrasts with a 28-percent decline in this trade reported for 1955. The large share of the kerosine moved in this river traffic was unloaded in district 2 (4.1 million barrels in 1955 and 4.4 million in 1956); small quantities were also delivered in district 1.

The tanker freight rate for kerosine on the Gulf coast-New York Harbor run changed many times in 1956 and trended sharply upward, as it did in 1955, according to Platt's Oil Price Handbook. The average charge for the year increased from 42.8 cents a barrel in 1955 to 56.3 cents in 1956. A "low" of 35.3 cents a barrel was posted in March 1956, and the "high" of $1.19 a barrel was reached in the closing month of the year.

DISTILLATE FUEL OIL

Distillate fuel oil produced at refineries increased 10.5 percent in 1956 about the same rate of gain as reported for 1955. Higher crude runs at refineries and an increased percentage yield were factors responsible for the higher distillate production. Imports—representing about 1 percent of the supply—were 17 percent above 1955. Additional small quantities were added to the supply as "transfers" from crude petroleum and from natural-gasoline plants.

The rate of production increase of distillate fuel oils in 1956 exceeded the 7-percent gain in overall demand, resulting in a 20-percent buildup of stocks at the end of the year compared with only a small addition to inventories in 1955.

A smaller increase in the number of new oil burners in use and weather warmer than normal during 1956 were the principal reasons for the lower percentage gain (6 percent in 1956 and 10 in 1955) in domestic demand. Domestic demand for light fuel oils was greater, percentage-wise, in the first three quarters of 1956 and declined 5 percent in the fourth quarter.

Sales of distillate fuel oils to gas and electric powerplants continued to drop in 1956. All other principal uses gained, the larger increases being in the totals reported as sold for bunker fuel and that used for fuel by the oil companies. Sales of distillate fuel oils, including diesel fuel, to railroads gained 6 percent compared with a 9-percent increase in 1955.

Deliveries of distillate fuel oils—mostly diesel fuel—to vessels increased 11 percent in 1956. The diesel fuel sold to vessels engaged in foreign trade increased 13 percent—from 9.2 million barrels in 1955 to 10.4 million in 1956, according to the Bureau of the Census, United States Department of Commerce; the indicated total of light bunker fuel delivered to vessels using coastal and inland waterways increased from 7.2 million barrels in 1955 to 7.8 million in 1956—an 8-percent gain.

Statistics released by the American Gas Association show that the consumption of diesel oil by manufactured-gas companies decreased from 2.1 million barrels in 1955 to 1.6 million in 1956; according to the Federal Power Commission, plants generating electric power used 4.2 million barrels of diesel oil in 1956 compared with 4.4 million in 1955 Total sales of distillate fuel oils to gas and electric powerplants lost 8 percent in 1956, compared with a 3-percent shrinkage in 1955.

TABLE 62.—Salient statistics of distillate fuel oil in the United States, 1955–56, by months and districts

(Thousand barrels)

Month and district	Production		Yield (percent)		Transfers from gasoline plants		Transfers [1] east of California		Imports		Exports		Domestic demand		Stocks, end of period	
	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]
Month:																
January	53,858	59,617	23.3	23.7	68	96	122	134	271	386	1,993	1,684	73,778	83,741	86,692	86,141
February	51,661	55,622	24.2	23.8	58	44	104	114	344	455	1,051	1,876	68,525	69,165	69,283	71,335
March	52,713	56,045	23.0	22.9	66	103	125	127	290	604	1,761	1,737	58,259	65,631	62,457	60,846
April	46,001	51,387	21.6	22.9	32	57	109	102	145	387	1,632	2,620	36,973	46,588	70,139	63,571
May	47,033	51,665	20.9	21.4	61	64	113	108	294	391	2,319	1,571	31,762	38,300	83,559	75,928
June	48,802	52,640	21.6	22.0	37	67	103	106	559	423	2,469	1,937	29,939	33,469	100,652	93,758
July	48,788	54,775	20.8	22.1	44	77	116	111	326	441	2,379	1,885	28,378	31,490	119,169	115,787
August	50,187	57,007	21.2	22.6	50	59	107	115	413	390	2,519	2,420	33,732	33,033	133,675	137,905
September	48,557	55,354	21.7	23.0	60	57	101	108	525	405	2,344	2,330	37,326	41,088	143,248	150,411
October	49,934	54,917	21.4	22.9	51	74	106	104	323	518	2,603	2,899	38,771	44,254	152,288	158,871
November	50,347	55,245	21.8	23.2	46	58	113	116	430	372	1,650	5,291	59,766	57,854	141,808	151,517
December	54,666	61,413	22.3	24.0	42	62	128	130	493	395	1,885	8,142	83,919	71,394	111,333	133,981
Total	602,547	665,687	22.0	22.9	615	818	1,347	1,375	4,413	5,167	24,605	34,392	581,128	616,007	111,333	133,981
District:																
East Coast	98,514	110,069	25.0	26.2	---	---	---	---							40,171	51,634
Appalachian	13,637	15,497	19.0	20.7	---	---	---	---							3,022	4,208
Indiana, Illinois, Kentucky, etc	99,187	104,954	19.9	20.5	---	---	324	333							18,621	20,981
Minnesota, Wisconsin, etc	(3)	8,057	(3)	25.6	---	---	(3)	---							(3)	7,831
Oklahoma, Kansas, etc	58,261	61,667	23.8	24.6	---	---	160	152							11,261	12,315
Texas Inland	17,969	18,816	19.5	19.0	122	274	498	496	(3)	(3)	(3)	(3)	(3)	(3)	2,118	1,917
Texas Gulf Coast	166,004	185,161	25.0	26.2	192	219	141	136							14,444	11,795
Louisiana Gulf Coast	59,053	66,197	24.2	25.5	26	27	43	37							5,964	5,483
Arkansas, Louisiana Inland, etc	7,910	7,986	23.3	23.0	275	298	20	28							2,042	1,913
Rocky Mountain	23,190	24,545	23.1	22.8	---	---	161	193							2,587	2,819
California	58,822	62,738	14.7	15.3	---	---	---	---							11,103	13,085
Total	602,547	665,687	22.0	22.9	615	818	1,347	1,375	4,413	5,167	24,605	34,392	581,128	616,007	111,333	133,981

[1] Figures represent crude oil used as fuel on pipelines, which is considered part of the demand for distillate.

[2] Preliminary figures.

[3] Figures not available.

TABLE 63.—Sales of distillate fuel oil [1] in the United States, 1952–56, by uses

(Thousand barrels)

Use	1952	1953	1954	1955	1956	Change in percent
Railroads	68,002	75,246	77,389	84,668	89,439	5.6
Vessels (including tankers)	17,213	16,898	15,563	16,675	18,487	10.9
Gas and electric power plants	8,350	6,825	6,070	5,884	5,403	−8.2
Smelters, mines, and manufacturing industries	42,760	42,384	41,589	43,606	44,949	3.1
Heating oils	263,379	267,498	304,540	[2] 339,215	359,827	6.1
Fuel oil (No. 1) sold as range oil	15,947	15,602	15,577	17,374	17,435	0.4
U. S. Army, Navy, Air Force, and Coast Guard	9,644	9,569	8,752	[2] 10,945	11,326	3.5
Oil-company fuel	7,976	7,755	7,699	8,597	10,131	17.8
Miscellaneous uses	45,939	47,067	49,066	54,163	58,778	8.5
Total United States	479,210	488,844	526,245	[2] 581,127	615,775	6.0

[1] Includes diesel fuel.
[2] Revised.

The unusual 40-percent expansion in exports of distillate fuel oil and shipments to noncontiguous Territories was due primarily to the cutting off of supplies from the Middle East by the closing of the Suez Canal. This condition is reflected in the large gain in exports of distillate fuel oil to many European countries. Exports to the Netherland Antilles and Japan were noticeably higher, but shipments to nearby countries not dependent on Middle East supplies showed little change.

Small amounts of light crude oil used as fuel by pipeline companies are added as "transfers" to the distillate-fuel-oil supply. The total gained slightly in 1956 in contrast to losses in recent years. Minor quantities of distillate fuel oil, produced at natural-gasoline plants and entered as "transfers" for the second consecutive year, also gained in 1956.

Imports of distillate fuel oils, relatively small in volume, increased 17 percent in 1956. The larger share came from the Netherland Antilles.

Rail and truck shipments of distillate fuel oils from district 5 to other Western States declined from 631,000 barrels in 1955 to 535,000 in 1956—a 15-percent loss. No distillate fuel oil was moved by tanker from the west coast to the east coast in 1956; however, 113,000 barrels was shipped in this traffic in 1955. Receipts, including imports of distillate fuel oils, in district 5 were 5.5 million barrels in 1956 compared with 3.8 million in 1955. These light fuel oils from outside sources made up 8 percent of the available supply of the area in 1956 and 6 percent in 1955.

Distillate fuel oils moved from the Gulf coast to east coast ports increased from 169.4 million barrels in 1955 to 191.7 million in 1956—a 13-percent gain, according to statistics published by the Office of Oil and Gas, United States Department of the Interior. Quantities in this movement credited to Texas increased from 137.9 million barrels in 1955 to 152.4 million in 1956, while those from Louisiana were 31.5 million in 1955 and 39.3 million in 1956.

TABLE 64.—Sales of distillate fuel oil [1] in the United States, 1952–56, by districts and States

(Thousand barrels)

District [2] and State	1952	1953	1954	1955	1956
District 1:					
Connecticut	12,286	12,520	14,928	16,071	18,490
Delaware	1,702	1,861	2,365	2,677	3,235
District of Columbia	3,368	3,458	3,728	3,907	4,139
Florida	6,863	7,176	8,441	9,613	10,169
Georgia	4,262	4,119	4,225	4,560	4,914
Maine	4,276	4,514	5,309	5,703	6,425
Maryland	11,189	11,731	14,468	16,009	17,916
Massachusetts	28,064	27,925	31,306	34,036	35,859
New Hampshire	3,442	3,370	4,220	4,498	5,123
New Jersey	33,028	33,124	35,733	38,971	41,335
New York	59,373	59,604	64,262	[3] 70,276	72,606
North Carolina	6,360	7,381	7,860	8,982	9,279
Pennsylvania	35,827	36,513	40,288	44,286	45,734
Rhode Island	4,343	4,482	4,484	4,762	5,513
South Carolina	2,491	3,004	2,990	3,259	3,445
Vermont	1,212	1,321	1,415	1,726	1,937
Virginia	9,800	9,442	10,888	13,242	14,293
West Virginia	1,188	1,331	1,307	1,500	2,095
Total	229,074	232,876	258,217	[3] 284,078	302,507
District 2:					
Illinois	29,061	29,021	30,388	33,371	35,290
Indiana	13,968	15,166	16,294	18,962	20,441
Iowa	10,204	10,488	10,399	11,417	12,543
Kansas	5,695	5,938	5,897	6,493	6,388
Kentucky	3,250	3,359	3,291	4,126	4,476
Michigan	22,268	22,351	24,625	27,402	29,071
Minnesota	15,478	15,784	16,218	17,409	18,765
Missouri	10,224	10,854	11,283	12,137	12,306
Nebraska	4,071	4,378	4,723	5,229	5,561
North Dakota	2,456	2,425	2,600	3,151	3,740
Ohio	15,953	16,542	18,150	20,184	21,937
Oklahoma	2,192	2,436	2,368	2,493	2,454
South Dakota	2,399	2,626	2,756	3,298	3,556
Tennessee	3,487	3,628	3,529	3,845	3,767
Wisconsin	11,803	11,877	13,648	16,089	17,099
Total	152,509	156,873	166,169	185,606	197,394
District 3:					
Alabama	3,073	3,186	3,508	3,914	4,277
Arkansas	2,325	2,222	2,136	2,357	2,558
Louisiana	5,840	6,212	6,242	7,385	7,653
Mississippi	1,502	1,774	1,619	1,808	1,840
New Mexico	1,224	1,309	1,457	1,991	2,167
Texas	19,022	19,046	18,913	20,728	22,258
Total	32,986	33,749	33,875	38,183	40,753
District 4:					
Colorado	2,503	2,732	3,108	3,371	3,532
Idaho	2,457	2,595	3,080	3,706	3,837
Montana	3,063	3,553	3,755	3,980	4,219
Utah	3,263	3,542	3,574	3,994	4,235
Wyoming	2,103	2,294	2,624	2,829	3,092
Total	13,389	14,716	16,141	17,880	18,915
District 5:					
Arizona	1,341	1,329	1,279	1,073	1,716
California	23,875	24,063	23,812	23,873	24,643
Nevada	2,158	2,281	2,375	1,686	1,748
Oregon	8,974	8,680	8,939	10,981	10,862
Washington	14,904	14,277	15,438	17,767	17,237
Total	51,252	50,630	51,843	55,380	56,206
Total United States	479,210	488,844	526,245	[3] 581,127	615,775

[1] Includes diesel fuel oil.
[2] States are grouped according to petroleum-marketing districts rather than conventional geographic regions.
[3] Revised.

TABLE 65.—Monthly average prices of distillate fuel oil and diesel fuel in the United States, 1955–56

[Platt's Oil Price Handbook]

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1955													
No. 2 fuel oil at refineries, Oklahoma..cents per gallon	8.87	8.88	8.88	8.88	8.88	8.68	8.46	8.31	8.25	8.33	8.50	8.69	8.63
No. 2 fuel oil at New York Harbor....do	10.20	10.20	10.20	10.14	10.05	10.05	10.05	10.20	10.30	10.05	10.10	10.30	10.15
Diesel oil, shore plants, New York Harbor....do	10.60	10.60	10.60	10.54	10.45	10.45	10.45	10.60	10.70	10.45	10.50	10.70	10.55
Diesel oil for ships:													
New York....dollars per barrel	4.30	4.30	4.30	4.30	4.24	4.24	4.24	4.30	4.34	4.34	4.34	4.34	4.30
New Orleans....do	3.95	3.95	3.95	3.95	3.95	3.95	3.95	4.00	4.03	4.03	4.03	4.03	3.98
San Pedro....do	4.20	4.20	4.20	4.21	4.30	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.29
1956													
No. 2 fuel oil at refineries, Oklahoma..cents per gallon	9.11	9.37	9.38	9.27	9.22	9.19	9.19	9.19	9.19	9.19	9.19	9.27	9.23
No. 2 fuel oil at New York Harbor....do	10.54	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.90	10.90	10.90	10.67
Diesel oil, shore plants, New York Harbor....do	10.94	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.31	11.30	11.30	11.07
Diesel oil for ships:													
New York....dollars per barrel	4.44	4.47	4.47	4.47	4.47	4.47	4.47	4.47	4.47	4.61	4.60	4.60	4.50
New Orleans....do	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03
San Pedro....do	4.33	4.35	4.80	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.93	5.04	4.77

Barge shipments of distillate fuel oils from the Gulf coast and Arkansas to inland terminals on the Mississippi River and its tributaries increased from 8.9 million barrels in 1955 to 13.5 million in 1956—a 52-percent gain compared with a 14-percent increase in 1955. The quantity from Texas increased from 1.4 million barrels in 1955 to 2.4 million in 1956; that from Louisiana from 3.5 million in 1955 to 5.0 million in 1956; and the portion from Arkansas and Mississippi was up from 4.0 million in 1955 to 6.1 million in 1956. The distillate fuel oils moved in this river traffic and unloaded in district 2 increased over 50 percent—from 8.0 million barrels in 1955 to 12.4 million in 1956, while those reaching district 1 went up from 0.9 million in 1955 to 1.1 million in 1956.

Further advances in the freight tanker rate for No. 2 distillate fuel oil on the Gulf coast—New York Harbor run brought the average charge from 44.9 cents a barrel in 1955 to 59.2 cents in 1956. A charge of 64.7 cents a barrel in January 1956 dropped to the "low" of the year of 37.4 cents a barrel in March. A number of subsequent changes brought the charge to $1.256 a barrel in December—the "high" of the year.

RESIDUAL FUEL OIL

The total supply of residual fuel oil in 1956 from all sources showed little change from 1955 (a gain of less than 1 percent). The petroleum refineries produced 72 percent of the supply and imports (higher by 7 percent), 27 percent. A small part of the supply, about 1 percent, known as "transfers," represents heavy crude used as fuel on leases or for industrial purposes.

The total demand for residual fuel oils in 1956 remained virtually the same as in 1955. However, domestic requirements (which made up about 95 percent of the total) showed a minor gain of 1 percent in 1956, compared with 7 percent in 1955, while exports (lower by 17 percent) contrasted with a 26-percent gain in 1955.

The domestic demand for residual fuel oils made small percentage gains in the first two quarters of 1956 but experienced minor losses in the final quarters. The small increase in domestic requirements in 1956 was due to the declining amount used by class I railroads (down 28 percent) and to a 3-percent shrinkage in the quantity consumed by electric powerplants.

The small percentage gain in the sales of heavy fuel oils for heating in 1956 was due largely to the warmer weather prevailing during the year. Sales of residual bunker oil to vessels in 1956 also gained only slightly. The quantity credited to vessels engaged in overseas traffic increased 3 percent—from 67.6 million barrels in 1955 to 69.5 million in 1956—while the indicated demand by vessels using coastal and inland waterways showed little change—46.0 million barrels in 1956 compared with 45.9 million in 1955. The higher percentage gain (8 percent in 1956 compared with 6 percent in 1955) in sales of residual fuel oils to the military services may be due partly to the revised 1956 instructions. The Bureau of Mines requested that oil companies show as sales for military uses in the 1956 survey the same quantity reported to the Petroleum Logistics Division, Department of Defense. This covered all oils sold to military services regardless of ultimate use,

TABLE 66.—Salient statistics of residual fuel oil in the United States, 1955–56, by months and districts

(Thousand barrels)

Month and district	Production		Yield (percent)		Transfers [1] East of California		Transfers [1] California		Imports		Exports		Domestic demand		Stocks, end of period	
	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]
Month:																
January	38,276	41,674	16.5	16.5	322	351	121	147	17,389	18,270	3,260	1,696	55,496	59,673	49,457	38,247
February	34,683	37,291	16.2	16.0	258	334	142	84	16,420	15,745	3,423	1,616	51,495	54,412	46,042	35,673
March	36,722	37,618	16.0	15.4	258	362	150	227	16,021	13,502	2,764	1,905	51,459	52,493	44,970	32,984
April	33,288	33,892	15.7	15.1	276	408	160	243	12,076	13,874	3,058	2,191	43,874	46,470	43,838	32,740
May	34,426	35,609	15.3	14.8	308	399	184	252	11,167	13,425	2,914	2,313	41,926	43,505	45,083	36,607
June	32,392	32,951	14.4	13.8	299	346	132	164	10,270	11,359	2,998	2,465	40,780	39,889	44,398	39,073
July	33,823	33,037	14.4	13.4	294	371	175	200	7,564	10,172	2,412	2,751	38,948	36,144	44,894	43,958
August	33,794	33,823	14.3	13.4	292	327	190	217	11,158	10,376	3,384	2,662	41,464	39,422	45,480	46,617
September	31,815	31,868	14.2	13.2	277	325	160	192	9,227	9,864	2,607	2,072	38,085	39,452	46,267	47,342
October	34,821	33,543	14.9	14.0	301	330	159	120	9,688	14,564	2,446	2,038	41,750	45,461	47,040	48,400
November	36,412	35,471	15.8	14.9	249	336	160	150	13,263	13,314	1,966	2,692	51,087	50,389	44,071	44,590
December	39,879	39,922	16.3	15.6	282	384	410	170	17,792	17,381	2,567	3,575	60,693	54,381	39,174	44,491
Total	420,331	426,699	15.3	14.7	3,416	4,273	2,143	2,166	152,035	161,846	33,799	27,976	557,057	561,691	39,174	44,491
District:																
East Coast	76,198	75,801	19.3	18.0	------	------	------	------							11,063	12,594
Appalachian	7,276	7,497	10.1	10.0	------	------	------	------							826	645
Indiana, Illinois, Kentucky, etc	63,421	64,791	12.7	12.6	610	1,055	------	------							3,803	5,817
Minnesota, Wisconsin, etc	(3)	2,615	(3)	8.3	(3)	36	------	------							(3)	387
Oklahoma, Kansas, etc	12,413	12,116	5.1	4.8	184	381	------	------							1,261	1,499
Texas inland	7,919	8,999	8.6	9.1	593	714	------	------	(3)	(3)	(3)	(3)	(3)	(3)	1,342	1,947
Texas Gulf Coast	88,977	91,913	13.4	13.0	254	606	------	------							6,896	5,544
Louisiana Gulf Coast	16,376	19,089	6.7	7.4	695	700	------	------							1,371	1,757
Arkansas, Louisiana Inland, etc	2,257	2,164	6.6	6.2	347	300	------	------							66	266
Rocky Mountain	14,689	14,368	14.6	13.4	733	481	------	------							736	956
California	130,805	127,346	32.9	31.1	------	------	2,143	2,166							11,810	13,079
Total	420,331	426,699	15.3	14.7	3,416	4,273	2,143	2,166	152,035	161,846	33,799	27,976	557,057	561,691	39,174	44,491

[1] Represents crude oil used as fuel on leases and for general industrial purposes.
[2] Preliminary figures.
[3] Figures not available.

TABLE 67.—Sales of residual fuel oil [1] in the United States, 1952–56, by uses

(Thousand barrels)

Uses	1952	1953	1954	1955	1956	Change in percent
Railroads	40,489	28,477	16,122	15,018	10,575	−29.6
Vessels (including tankers)	110,412	114,324	108,790	115,128	117,445	2.0
Gas and electric power plants	70,497	85,352	70,749	75,966	73,962	−2.6
Smelters, mines, and manufacturing industries	158,373	166,748	160,121	173,030	177,807	2.8
Heating oils	79,151	81,824	78,845	86,282	87,601	1.5
U. S. Army, Navy, Air Force, and Coast Guard	37,185	30,435	26,887	[2] 28,368	30,546	7.7
Oil-company fuel	54,421	51,243	52,165	53,387	53,271	−0.2
Miscellaneous uses	5,745	6,326	7,035	9,804	10,331	5.4
Total United States	556,273	564,729	520,714	[2] 556,983	561,538	0.8

[1] Includes Navy grade and crude oil burned as fuel.
[2] Revised.

including fuel oil intended for heating Government buildings, which previously was reported under the heating item.

The fractional percentage gain in sales of residual fuel oils in 1956 was due largely to the 30-percent decline in railroad requirements, to the smaller quantities credited to gas and electric-power companies, and to the slightly lower use of heavy oils for fuel by oil companies. Railroads, in their shift to diesel fuel in recent years, have lowered their purchases of residual fuel oils from a peak of over 116,000,000 barrels in 1943 to less than 11,000,000 in 1956. Lower sales of heavy fuel oils to gas and electric powerplants in 1956 contrast with a 7-percent gain in 1955. Residual fuel oil consumed by electric powerplants declined 3 percent—from 70.9 million barrels in 1955 to 68.5 million in 1956, according to the Federal Power Commission—while the quantity used by manufactured-gas companies was 26 percent lower, dropping from 5.7 million barrels in 1955 to 4.2 million in 1956, according to data released by the American Gas Association. The heavy fuel oil used by the petroleum industry in 1956 was slightly below that consumed in 1955. Increased use of natural gas and electric power at petroleum refineries in 1956 was the principal factor that brought about the lower consumption of residual fuel oils by petroleum companies during the year.

The sharp drop in exports of residual fuel oils in 1956 was the net result of lower shipments to Netherland Antilles (2.3 million barrels in 1955 and none in 1956); Chile (2.2 million in 1955 and 0.9 million in 1956); and Japan (9.1 million in 1955 and 4.9 million in 1956). Exports of residual fuel oils to Canada, Mexico, Cuba, and the United Kingdom gained slightly in 1956.

A 6-percent increase in crude runs in 1956 was offset by a lower percentage yield (14.7 percent in 1956 compared with 15.3 percent in 1955); consequently, the production increased less than 2 percent.

The supply of residual fuel oils in 1956 was enough to satisfy domestic and export requirements and to provide an additional 5.3 million barrels to stocks in contrast to a withdrawal of 12.9 million in 1955. Consequently, stocks of residual fuel oils gained 14 percent in 1956 compared with a 25-percent shrinkage in 1955.

TABLE 68.—Sales of residual fuel oil [1] in the United States, 1952–56, by districts and States

(Thousand barrels)

District [2] and State	1952	1953	1954	1955	1956
District 1:					
Connecticut	13,475	14,377	12,897	13,108	13,219
Delaware	2,501	2,558	2,228	2,907	2,956
District of Columbia	1,915	2,035	1,963	2,152	2,106
Florida	24,789	27,343	28,909	32,236	34,910
Georgia	5,816	6,573	5,590	6,118	5,955
Maine	4,032	4,228	3,481	4,443	4,872
Maryland	14,852	15,323	14,031	15,466	15,770
Massachusetts	30,003	32,763	30,500	30,496	29,574
New Hampshire	2,295	2,467	2,129	2,377	2,107
New Jersey	44,153	47,667	43,339	46,154	44,587
New York	50,966	53,437	50,809	[3] 51,912	51,737
North Carolina	1,257	1,439	1,809	2,377	2,558
Pennsylvania	42,491	42,951	42,734	45,176	45,325
Rhode Island	9,756	10,993	9,473	11,215	11,303
South Carolina	5,230	5,332	3,985	4,291	4,389
Vermont	300	475	409	424	402
Virginia	20,294	15,523	12,998	16,556	17,452
West Virginia	1,337	1,526	1,269	1,355	1,317
Total	275,462	287,010	268,553	[3] 288,763	290,539
District 2:					
Illinois	20,455	20,823	20,499	22,227	22,571
Indiana	17,230	17,679	14,234	14,588	15,206
Iowa	1,217	1,051	884	994	1,165
Kansas	6,071	5,247	4,020	4,179	3,827
Kentucky	738	913	949	1,013	1,062
Michigan	14,153	14,809	14,675	15,387	16,008
Minnesota	2,430	2,370	2,352	2,700	2,987
Missouri	5,146	5,140	4,837	5,863	6,126
Nebraska	334	351	313	363	377
North Dakota	120	124	179	515	870
Ohio	17,670	18,698	18,118	18,915	19,260
Oklahoma	3,011	2,351	1,479	1,783	1,857
South Dakota	239	232	165	176	211
Tennessee	1,097	1,257	652	930	879
Wisconsin	2,042	2,118	2,109	2,168	2,290
Total	91,953	93,163	85,465	91,801	94,696
District 3:					
Alabama	2,677	3,873	3,123	3,907	4,162
Arkansas	1,497	1,006	415	419	545
Louisiana	10,422	9,929	9,710	10,601	10,804
Mississippi	173	163	160	179	219
New Mexico	831	696	262	283	505
Texas	46,508	41,978	36,312	38,108	37,883
Total	62,108	57,645	49,982	53,497	54,118
District 4:					
Colorado	1,203	1,124	1,326	1,363	1,434
Idaho	1,029	1,067	1,115	1,421	1,256
Montana	4,220	3,276	1,751	1,692	1,646
Utah	5,351	5,044	4,321	4,392	4,478
Wyoming	2,819	2,762	2,076	2,118	2,156
Total	14,622	13,273	10,589	10,986	10,970
District 5:					
Arizona	542	206	45	61	35
California	79,127	85,870	79,973	83,959	84,421
Nevada	2,266	2,048	1,353	1,359	383
Oregon	13,168	11,186	9,776	10,152	9,401
Washington	17,025	14,328	14,978	16,405	16,975
Total	112,128	113,638	106,125	111,936	111,215
Total United States	556,273	564,729	520,714	[3] 556,983	561,538

[1] Includes some crude oil burned as fuel.
[2] States are grouped according to petroleum-marketing districts rather than conventional geographic regions.
[3] Revised.

TABLE 69.—Monthly average prices of residual fuel oil in the United States, 1955–56, in dollars per barrel

[Platt's Oil Price Handbook]

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1955													
No. 6 fuel oil at refineries, Oklahoma	1.57	1.58	1.58	1.59	1.65	1.79	1.83	1.83	1.83	1.83	1.83	1.96	1.74
No. 5 fuel oil at New York Harbor	2.87	2.87	2.87	2.87	2.87	2.87	2.94	3.06	3.08	3.08	3.10	3.13	2.97
Bunker "C" for ships:													
New York	2.35	2.35	2.35	2.35	2.35	2.35	2.44	2.61	2.65	2.65	2.65	2.65	2.48
New Orleans	1.95	2.05	2.05	2.05	2.05	2.05	2.12	2.20	2.20	2.20	2.20	2.20	2.11
San Pedro	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.87	1.95	1.99	1.83
1956													
No. 6 fuel oil at refineries, Oklahoma	2.14	2.15	2.12	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.14	2.39	2.14
No. 5 fuel oil at New York Harbor	3.17	3.18	3.18	3.18	3.18	3.22	3.30	3.30	3.30	3.30	3.42	3.53	3.27
Bunker "C" for ships:													
New York	2.65	2.65	2.65	2.65	2.65	2.69	2.80	2.80	2.80	2.80	2.93	3.05	2.76
New Orleans	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.30	2.48	2.23
San Pedro	2.08	2.11	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.33	2.50	2.18

Residual fuel oils stored at refineries at the close of 1956 represented 77 percent of the total—a 17-percent gain for the year—while those at bulk terminals and in pipelines were higher by only 2 percent. The 1956 year-end inventory of heavy fuel oil represented a 23-day supply at the January 1957 daily rate of demand, compared with a 20-day supply at the close of 1955.

Shipments of residual fuel oils out of district 5 totaled 18.4 million barrels in 1956—a 54-percent decline compared with a 83-percent gain in 1955. Exports from the West Coast refinery district were 11.5 million barrels in 1956, or about half the 1955 total. Shipments to Alaska and Hawaii were slightly higher than in 1955. The shipments of heavy fuel oils by tanker from the west coast to the east coast, which occurred in 1955 when marketing conditions on the east coast were more favorable, stopped in January 1956. Rail and truck shipments of residual fuel oils from district 5 to other Western States showed no change in volume, remaining at 0.4 million barrels in both 1955 and 1956. Receipts of residual fuel oils, including imports, in district 5 declined from 1.3 million barrels in 1955 to 0.8 million in 1956.

Residual fuel oils moved by tanker and barge from the Gulf coast to Atlantic coast ports increased from 51.8 million barrels in 1955 to 55.7 million in 1956—an 8-percent gain compared with a 10-percent decline in 1955. The fuel oil in this traffic shipped from Texas increased from 48.5 million barrels in 1955 to 51.6 million in 1956; quantities loaded in Louisiana were 3.3 million in 1955 and 4.2 million in 1956.

There was a small decline (from 6.7 million barrels in 1955 to 6.3 million in 1956) in the residual fuel oil shipped by barge from the Gulf coast and Arkansas to inland ports on the Mississippi River and its tributaries. Most of the heavy fuel oil handled in this river traffic was loaded in Texas; this State was credited with 5.2 million barrels in 1955 and 4.6 million in 1956; that from Louisiana increased slightly—from 1.5 million in 1955 to 1.6 million in 1956. Minor quantities also came from Arkansas and Mississippi (30,000 barrels in 1955 and 62,000 in 1956). The residual fuel oil in this barge movement unloaded in district 2 increased from 3.4 million barrels in 1955 to 3.6 million in 1956, while the quantities reaching district 1 were 3.3 million in 1955 and 2.7 million in 1956.

The tanker freight rate for Bunker "C" fuel oil on the Gulf coast-New York Harbor run in 1956 followed the same pattern as kerosine and No. 2 distillate fuel oil, with a "low" of 43.8 cents a barrel in March and a "high" of $1.407 a barrel at the year end. The yearly average price for this heavy grade of fuel oil rose from 43.2 cents a barrel in 1955 to 74.2 cents in 1956.

LUBRICANTS

The total demand for lubricants varies with the number of motor vehicles, industrial activity, and export demand. The improved quality of motor-vehicle lubricants has resulted in ability of the oil to withstand longer use, requiring less frequent oil changes and greasing. Export demand for lubricants continued to decline as refineries abroad installed facilities to supply their markets.

The total demand for lubricants amounted to 57.8 million barrels in 1956, which included exports of 13.9 million barrels and a domestic demand of 43.9 million barrels. Domestic demand increased 3.4 percent for the year.

The 1956 production of lubricants increased in all refining districts except Texas Inland and Arkansas-Louisiana Inland. The East Coast district, which had shown declining production for the past 2 years, produced 1.1 million barrels more lubricants in 1956.

TABLE 70.—Salient statistics of lubricants in the United States, 1955–56, by months and districts

Month and district	Production (thousand barrels)		Yield (percent)		Domestic demand (thousand barrels)		Stocks, end of period (thousand barrels)	
	1955	1956 [1]	1955	1956 [1]	1955	1956 [1]	1955	1956 [1]
By months:								
January	4,565	4,985	1.6	2.0	3,157	3,512	10,162	9,167
February	3,992	4,536	1.7	1.9	2,925	3,415	10,087	9,309
March	4,602	4,996	1.8	2.1	3,665	3,478	9,779	9,646
April	4,691	5,108	2.4	2.3	3,587	3,767	9,615	9,725
May	4,740	5,164	2.2	2.1	3,769	3,981	9,430	9,542
June	4,818	5,010	2.1	2.1	3,745	3,599	9,233	9,754
July	4,557	4,749	1.9	1.9	3,493	3,717	8,947	9,694
August	4,871	5,005	2.0	2.0	3,986	3,855	8,547	9,547
September	4,526	4,706	1.9	2.0	3,567	3,495	8,291	9,664
October	4,666	5,112	2.0	2.1	3,726	4,118	8,108	9,536
November	5,115	4,970	2.3	2.1	3,708	3,506	8,433	10,060
December	4,693	4,870	1.9	1.9	3,149	3,491	8,763	10,182
Total	55,836	59,211	2.0	2.0	42,477	43,934	8,763	10,182
By districts:								
East Coast	7,786	8,911	2.0	2.1	(2)	(2)	1,970	2,288
Appalachian	4,765	4,897	6.6	6.7			706	725
Indiana, Illinois, Kentucky, etc	4,763	5,193	1.0	1.0			986	1,255
Oklahoma, Kansas, etc	4,390	4,859	1.8	1.9			436	556
Texas Inland	144	65	.2	.1			9	4
Texas Gulf Coast	21,163	21,929	3.2	3.1			3,134	3,692
Louisiana Gulf Coast	5,771	6,295	2.4	2.4			667	897
Arkansas, Louisiana Inland, etc	1,904	1,852	5.6	5.3			127	97
Rocky Mountain	188	199	.2	.2			91	86
West Coast	4,962	5,011	1.3	1.2			637	582
Total	55,836	59,211	2.0	2.0	--------	--------	8,763	10,182

[1] Preliminary figures.
[2] Figures not available.

LIQUEFIED GASES

Liquefied gases are derived from two sources. Those produced at refineries are called liquefied refinery gases to distinguish from those extracted from natural gas and called liquefied petroleum gases. The liquefied petroleum gases are all saturated (that is, propane, butane, etc.). The liquefied refinery gases may contain unsaturated compounds or olefins (that is, propylene, butylene, etc.). The olefins are used as feed stock for chemical plants. The saturated gases may be used as chemical raw material or as fuel. Liquefied gases are also used in producing gasoline, and are reported in this chapter as natural-gas liquids used at refineries or as gasoline.

The domestic demand for liquefied gases increased 6.5 percent. Petroleum refineries increased the output of liquefied refinery gases from 43.6 million barrels in 1955 to 52.0 million barrels in 1956.

TABLE 71.—Average monthly refinery prices of five selected grades of lubricating oil in the United States, 1955–56, in cents per gallon

[Platt's Oil Price Handbook]

Year and grade	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average for year
1955													
Oklahoma:													
200 viscosity, No. 3 color, neutral	13.25	13.25	13.25	13.25	13.25	13.25	13.25	12.48	14.25	14.60	15.25	15.64	13.75
150–160 viscosity at 210° bright stock, 10–25 pour test	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.73	18.50	18.85	19.50	19.89	18.08
Pennsylvania:													
200 viscosity, No. 3 color, neutral 420–425 flash, 25 pour test	17.09	17.50	17.50	17.50	17.50	17.50	17.81	18.17	19.08	19.29	19.50	19.89	18.19
600 steam-refined, cylinder stock, filterable	10.50	10.50	10.75	10.75	10.75	10.75	10.85	11.76	13.18	13.94	15.27	15.25	12.02
South Texas: 500 viscosity, No. 2½–3½ color, neutral	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75
1956													
Oklahoma:													
200 viscosity, No. 3 color, neutral	16.25	16.25	17.09	17.25	17.25	17.25	17.25	17.25	17.25	17.25	17.25	17.25	17.07
150–160 viscosity at 210° bright stock, 10–25 pour test	20.50	20.50	21.34	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.32
Pennsylvania:													
200 viscosity, No. 3 color, neutral, 420–425 flash, 25 pour test	20.26	20.50	20.66	21.00	21.52	22.82	23.60	24.87	25.00	25.00	25.00	25.00	22.94
600 steam-refined, cylinder stock, filterable	15.79	16.36	16.96	17.75	18.63	19.50	19.87	20.50	20.50	20.50	20.50	20.50	18.95
South Texas: 500 viscosity, No. 2½–3½ color, neutral	14.75	14.75	14.75	14.75	14.75	14.75	14.75	15.22	15.75	15.75	15.75	15.75	15.12

JET FUELS

At present jet fuel is used primarily by the military forces in combat planes or by aircraft manufacturers for engine-testing purposes. Commercial planes with turboprop engines use kerosine as fuel. Jet fuel is a blend of gasoline, kerosine, and distillate fuel oil. Since 1952, when separate data were first compiled, the trend has shown increased use of low-grade gasoline and smaller amounts of kerosine and distillate. In 1956 the average jet fuel produced contained 77.5 percent gasoline, 16.7 percent kerosine, and 5.8 percent distillate fuel oil.

The domestic demand for jet fuel in 1956 was 70.0 million barrels. To compare the demand with previous years, imports of 5.6 million should be omitted. These imports formerly were included in the gasoline imports. The United States Department of Commerce does not have a separate classification for jet fuel as such and includes these imports under motor fuel. A check with the military establishment indicated that imports by the United States Department of Defense, shown in the data released by the Commerce Department as gasoline, were actually jet fuel. Until such time as a separate classification can be established for jet fuel, permission has been granted the Bureau of Mines to break down the gasoline imports between gasoline and jet fuel and to publish the information separately.

OTHER PRODUCTS

Wax.—Wax is used principally for waterproofing paper products and for candles. The petroleum industry supplies approximately 94 percent of the total wax output. In 1956 the total demand for wax of petroleum origin was 5.3 million barrels (converted at the rate of 280 pounds per barrel)—the same as in 1955.

Coke.—Petroleum coke is formed in cracking operations. In catalytic cracking plants the coke is formed on the catalyst and must be burned off at the plant. This coke is not marketable, but the heat generated in burning it from the catalyst is utilized as refinery fuel. Coke produced at thermal cracking units is recoverable and can be marketed. In recent years several refineries having an excess of residual fuel oils have installed coking facilities to crack the heavier fuel oils and recover the more profitable products and produce a marketable grade of coke. Much of this coke is made into electrodes employed in electrolytic production of aluminum.

In 1956 the total demand for petroleum coke was 31.3 million barrels, including exports of 6.4 million barrels (converted at the rate of 5 barrels to the short ton). Refineries used 13.4 million barrels for fuel, most of which was catalyst coke.

Still Gas.—The production of still gas increased from 116.5 million barrels in 1955 to 122.0 million barrels in 1956 or from 593 to 648 billion cubic feet. The conversion from cubic feet to barrels is in terms of the crude-oil equivalent to balance the refinery input and output and not on the basis of heating value. Most of the still gas is consumed as refinery fuel.

TABLE 72.—Salient statistics of wax in the United States, 1955–56, by types, months, and districts

(Thousand barrels) [1]

	Production						Domestic demand (all types)		Exports (all types)		Stocks, end of period					
	1955			1956 [2]							1955			1956 [2]		
	Micro-crystalline	Fully refined	Other	Micro-crystalline	Fully refined	Other	1955	1956 [2]	1955	1956 [2]	Micro-crystalline	Fully refined	Other	Micro-crystalline	Fully refined	Other
By months:																
January	46	239	148	56	217	171	335	376	81	81	102	248	229	92	238	208
February	44	201	182	48	261	135	320	340	108	76	102	235	241	89	258	219
March	51	246	169	56	278	145	365	442	137	86	98	213	231	79	235	203
April	40	248	153	49	258	81	318	322	113	81	87	220	245	84	251	167
May	59	244	120	54	262	169	326	362	95	75	88	237	229	93	276	181
June	59	268	137	57	219	172	349	370	79	62	93	255	242	97	282	187
July	54	241	138	50	198	151	311	333	110	66	101	255	246	97	267	202
August	46	220	142	54	246	166	326	380	111	75	98	246	229	105	265	207
September	50	229	137	102	190	149	334	341	94	69	94	230	237	109	278	221
October	57	262	126	100	200	150	356	369	115	84	91	238	206	107	265	233
November	60	259	163	95	201	150	379	376	102	64	94	239	203	118	255	238
December	65	229	161	112	213	152	337	328	103	102	99	238	214	118	287	253
Total	631	2,886	1,776	833	2,743	1,791	4,056	4,339	1,248	921	99	238	214	118	287	253
By districts:																
East Coast	227	1,173	292	414	1,048	373					29	44	30	35	67	29
Appalachian	22	82	320	12	96	332					9	31	17	20	37	14
Indiana, Illinois, Kentucky, etc.	13	186	20	17	184	31					1	20	27	1	11	26
Oklahoma, Kansas, etc.	177	117	145	205	136	182	(3)	(3)	(3)	(3)	23	5	7	27	4	16
Texas Inland	56			43							7			4		
Texas Gulf Coast	97	694	384	102	689	283					23	27	76	26	32	103
Louisiana Gulf Coast	32	101	608	38	58	576					6	4	35	4	11	50
Rocky Mountain	7	71	7	2	61	14					1	10	22	1	10	15
West Coast		462			471							97			115	
Total	631	2,886	1,776	833	2,743	1,791					99	238	214	118	287	253

[1] Conversion factor: 280 pounds to the barrel.
[2] Preliminary figures.
[3] Figures not available.

TABLE 73.—Average monthly refinery prices of 124°–126° white crude scale wax at Pennsylvania refineries, 1952–56, in cents per pound

[Platt's Oil Price Handbook]

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average for year
1952	4.83	4.73	4.40	4.38	4.35	4.25	4.14	4.12	3.93	3.88	3.82	3.81	4.22
1953	3.81	3.81	3.90	4.34	4.56	4.85	5.00	5.00	5.00	5.00	5.00	5.00	4.61
1954	5.00	5.00	5.05	5.13	5.16	5.44	5.45	5.45	5.45	5.45	5.45	5.45	5.29
1955	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.65	5.47
1956	5.91	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.03	6.25	6.02

TABLE 74.—Salient statistics of petroleum coke in the United States, 1955–56, by months and districts [1]

	Production (thousand barrels)		Yields (percent)		Domestic demand (thousand barrels)		Stocks, end of period (thousand barrels)	
	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]	1955	1956 [2]
By months:								
January	2,285	2,657	1.0	1.1	1,931	2,229	2,245	1,607
February	2,181	2,497	1.0	1.1	1,765	1,952	2,369	1,666
March	2,428	2,616	1.1	1.1	2,055	2,194	2,380	1,720
April	2,190	2,268	1.0	1.0	1,705	1,686	2,491	1,734
May	2,381	2,477	1.1	1.0	2,192	1,844	2,363	1,719
June	2,396	2,689	1.1	1.1	2,079	2,269	2,198	1,712
July	2,412	2,759	1.0	1.1	1,915	2,152	2,184	1,777
August	2,335	2,674	1.0	1.1	2,061	2,018	2,012	1,704
September	2,086	2,593	.9	1.1	2,003	2,005	1,806	1,681
October	2,366	2,523	1.0	1.0	2,028	1,936	1,648	1,540
November	2,597	2,596	1.1	1.1	2,364	2,001	1,536	1,558
December	2,680	2,746	1.1	1.1	2,305	2,588	1,524	1,319
Total	28,337	31,095	1.0	1.1	24,403	24,874	1,524	1,319
By districts:								
East Coast	1,611	1,977	.4	.5			8	31
Appalachian	357	445	.5	1.1				
Indiana, Illinois, Kentucky, etc.	10,606	10,585	2.1	2.1			366	288
Minnesota, Wisconsin, etc.	(3)	1,078	(3)	3.4			(3)	143
Oklahoma, Kansas, etc.	4,247	5,096	1.7	2.0			270	68
Texas Inland	938	708	1.0	.7	(4)	(4)	69	55
Texas Gulf Coast	2,767	2,856	.4	.4				
Louisiana Gulf Coast	2,670	2,853	1.1	1.1			12	7
Arkansas, Louisiana Inland, etc.	801	822	2.4	2.4			1	27
Rocky Mountain	1,087	1,294	1.1	1.3			171	70
West Coast	3,253	3,381	.8	.8			627	630
Total	28,337	31,095	1.0	1.1			1,524	1,319

[1] Conversion factor: 5.0 barrels to the short ton.
[2] Preliminary figures.
[3] Included with Indiana, Illinois, Kentucky, etc.
[4] Figures not available.

Asphalt and Road Oil.—The domestic demand for asphalt continued the upward trend and showed an 8.7-percent increase over 1955. The primary uses of asphalt are for building and highway construction; both were active throughout the year. Road-oil use declined 0.3 million barrels in 1956.

Sales of asphalt and road oil by States and uses are shown in the Petroleum Asphalt chapter of the Minerals Yearbook.

Miscellaneous Oils.—The demand for miscellaneous finished oils increased 1.4 million barrels in 1956 or 9.7 percent. "Specialties and other" showed the largest increase in production. These categories include the products usually termed petrochemicals.

Unfinished Oils.—Unfinished oils include all oils requiring cracking or further distillation, except the unfinished gasoline portion of naphtha distillate. Unfinished oils ordinarily are rerun and become finished products.

TABLE 75.—Production of still gas in the United States, 1954–56, by districts [1]

	1954		1955		1956 [2]	
	Million cubic feet	Equivalent in thousand barrels	Million cubic feet	Equivalent in thousand barrels	Million cubic feet	Equivalent in thousand barrels
East Coast	60,464	12,694	72,093	14,080	73,636	14,269
Appalachian	14,235	3,679	14,889	3,848	16,835	3,997
Indiana, Illinois, Kentucky, etc	98,370	21,891	118,306	24,506	128,691	25,479
Minnesota, Wisconsin, North Dakota, and South Dakota	(3)	(3)	(3)	(3)	3,952	868
Oklahoma, Kansas, etc	31,631	7,313	40,179	8,890	48,051	9,648
Texas Inland	20,411	4,647	23,498	5,031	27,337	5,529
Texas Gulf Coast	135,923	26,425	154,141	28,153	169,209	29,357
Louisiana Gulf Coast	35,030	6,251	48,353	9,147	51,783	9,105
Arkansas, Louisiana Inland, etc	6,220	1,402	5,798	1,337	5,709	1,192
New Mexico	(4)	[5] 80	(4)	[5] 67	(4)	134
Rocky Mountain	15,503	3,467	17,433	3,668	20,065	4,106
West Coast	76,703	14,703	98,137	17,779	102,277	18,309
Total	494,490	102,552	592,827	116,506	647,545	121,993

[1] Preliminary figures.
[2] Conversion factor: 3,600 cubic feet to the barrel.
[3] Formerly included with Indiana, Illinois, Kentucky, etc.
[4] Included with Rocky Mountain.
[5] Formerly included with Rocky Mountain.

TABLE 76.—Production of miscellaneous finished oils in the United States in 1956, by districts and classes [1]

(Thousand barrels)

District	Petrolatum	Medicinal oil	Absorption oil	Specialties oil	Solvents	Other	Total [2]
East Coast	----------	37	----------	1,851	137	----------	2,025
Appalachian	172	12	----------	35	----------	----------	219
Indiana, Illinois, Kentucky, etc	18	----------	----------	1,100	40	356	1,514
Minnesota, Wisconsin, North and South Dakota	----------	----------	----------	----------	----------	29	29
Oklahoma, Kansas, etc	453	----------	156	240	----------	8	857
Texas Inland	----------	----------	1,161	----------	----------	356	1,517
Texas Gulf Coast	112	----------	76	225	----------	1,945	2,358
Louisiana Gulf Coast	3	----------	196	1,595	----------	1	1,795
Arkansas-Louisiana Inland	----------	----------	913	----------	60	28	1,001
Rocky Mountain and New Mexico	----------	----------	5	35	----------	92	132
West Coast	----------	40	21	546	157	2,629	3,393
Total	758	89	2,528	5,627	394	5,444	14,840

[1] Includes production at natural-gasoline and cycling plants.
[2] Conversion factor: 300 pounds to the barrel.

INTERCOASTAL SHIPMENTS

Crude oil and products moved from Gulf coast ports to east coast ports constitute the major portion of intercoastal shipments. Some products are moved from California to the east coast and from the Gulf coast to California, but the volume of these shipments is small.

Total shipments from the Gulf coast to the east coast amounted to 711 million barrels in 1956, up 48 million from the 1955 total. Except for lubricating oils, which declined slightly, the movement for all products and crude oil was above that in the previous year.

TABLE 77.—Petroleum oils, crude and refined, shipped commercially from Gulf coast to east coast ports of the United States, 1955–56, by classes [1]

(Thousand barrels)

Year and class	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1955													
Crude petroleum	15, 402	12, 536	14, 485	12, 073	13, 053	11, 377	13, 870	12, 526	13, 144	13, 845	12, 792	14, 389	159, 492
Gasoline	16, 266	15, 546	19, 654	18, 259	20, 830	18, 464	18, 801	18, 381	18, 534	19, 212	18, 158	17, 305	219, 410
Kerosine	5, 336	4, 827	3, 832	3, 205	2, 676	2, 197	3, 236	3, 304	2, 767	3, 771	3, 799	4, 895	43, 845
Distillate fuel oil	20, 770	18, 116	16, 782	10, 822	11, 513	10, 126	11, 549	12, 435	11, 923	12, 561	13, 956	18, 844	169, 397
Residual fuel oil	4, 323	3, 807	4, 561	4, 268	4, 459	3, 741	4, 141	3, 798	4, 426	4, 686	4, 241	5, 393	51, 844
Lubricating oils	1, 214	636	806	680	1, 028	697	808	818	780	792	724	721	9, 704
Miscellaneous oils	592	581	741	795	663	885	623	818	709	689	865	896	8, 857
Total	63, 903	56, 049	60, 861	50, 102	54, 222	47, 487	53, 028	52, 080	52, 283	55, 556	54, 535	62, 443	662, 549
1956													
Crude petroleum	15, 019	15, 362	15, 074	12, 421	11, 223	11, 965	12, 961	14, 424	13, 363	13, 686	15, 330	17, 965	168, 793
Gasoline	16, 123	17, 012	20, 904	18, 816	21, 770	19, 765	20, 738	21, 097	18, 491	18, 546	17, 677	16, 999	227, 938
Kerosine	5, 726	4, 668	3, 376	3, 006	2, 709	2, 899	3, 464	3, 528	3, 437	4, 361	3, 502	4, 947	45, 623
Distillate fuel oil	24, 037	21, 712	16, 410	13, 470	12, 641	12, 558	13, 798	14, 509	13, 576	16, 089	14, 800	18, 106	191, 706
Residual fuel oil	5, 497	5, 285	5, 513	4, 084	5, 159	4, 823	4, 233	4, 945	3, 741	4, 290	4, 098	4, 060	55, 728
Lubricating oils	767	945	717	797	722	678	731	552	707	832	641	660	8, 749
Miscellaneous oils	1, 233	1, 007	1, 099	604	1, 343	874	778	627	1, 110	1, 201	1, 440	914	12, 230
Total	68, 402	65, 991	63, 093	53, 198	55, 567	53, 562	56, 703	59, 682	54, 425	59, 005	57, 488	63, 651	710, 767

[1] Office of Oil and Gas, U. S. Department of the Interior.

FOREIGN TRADE

Foreign trade statistics in this section, as reported by the United States Department of Commerce, differ slightly from those used in other sections of this chapter. Bureau of Mines petroleum-import statistics pertain to continental United States only, and its export statistics include not only foreign countries but also shipments to Territories. Data on imports of crude petroleum and unfinished oils (table 78) are obtained by the Bureau of Mines from petroleum companies to balance refinery reports and therefore differ from the totals reported by the United States Department of Commerce.

Imports.—Petroleum imports into continental United States continued to increase and were 14.3 percent above those in 1955, averaging 1.4 million barrels per day. Imports accounted for 15.4 percent of the total supply compared with 14.4 percent in 1955. Crude oil and residual fuel oil were the principal oils imported, crude oil composing 65 percent and residual fuel oil 31 percent of the total. Net imports (imports minus exports) into continental United States averaged 1,016,000 barrels daily in 1956, compared with 900,000 barrels in 1955.

According to the United States Department of Commerce, crude-petroleum imports averaged 944,000 barrels daily, an 18-percent increase over 1955. Venezuela supplied 51 percent of the crude-oil imports. Receipts from Canada by pipeline more than doubled in 1956, as refineries in the Minnesota-Wisconsin district and the West Coast district increased the use of this crude oil.

Residual-fuel-oil imports, mostly of Venezuelan or Netherland Antilles origin, were 10 million barrels higher than in 1955.

Exports.—Crude-petroleum and refined-product exports from the United States were below the 1955 average for the first 10 months of 1956. Then the Egyptian Government closed the Suez Canal, and emergency shipments to relieve the petroleum shortage in Europe caused exports to exceed those in 1955. These emergency shipments were, for the most part, crude oil, gasoline, and distillate fuel oil. Exports from continental United States averaged 429,000 barrels daily in 1956, with shipments for the last 2 months averaging 856,000 barrels per day.

TABLE 78.—Petroleum oils, crude and refined, imported into continental United States, 1955–56, by months[1]

(Thousand barrels)

Year and class	January	February	March	April	May	June	July	August	September	October	November	December	Total
1955													
Crude petroleum	22,922	21,033	22,989	20,907	23,017	22,934	25,788	23,406	24,882	25,439	24,685	27,419	285,421
Refined products:													
Gasoline	307	534	575	125	310	297	384	258	1,063	206	537	213	4,809
Distillate fuel oil	271	344	290	145	294	559	326	413	525	323	430	493	4,413
Residual fuel oil	17,389	16,420	16,021	12,076	11,167	10,270	7,564	11,158	9,227	9,688	13,263	17,792	152,035
Asphalt	165	209	249	302	227	269	496	279	349	323	175	282	3,325
Unfinished oils	357	172	463	477	302	523	492	557	685	585	427	521	5,561
Total	41,411	38,712	40,587	34,032	35,317	34,852	35,050	36,071	36,731	36,564	39,517	46,720	455,564
1956[2]													
Crude petroleum	24,944	24,584	28,942	24,462	29,074	29,606	33,593	31,029	31,281	31,123	26,124	27,071	341,833
Refined products:													
Gasoline (excludes jet)	11	111	84	5	139	500	338	188	76	235	31	27	1,745
Kerosine									9		1		10
Distillate fuel oil	386	455	604	387	391	423	441	390	405	518	372	395	5,167
Residual fuel oil	18,270	15,745	13,502	13,874	13,425	11,359	10,172	10,376	9,864	14,564	13,314	17,381	161,846
Jet fuel[3]	123	83	716		554	575	535	360	1,117	929	523	119	5,634
Asphalt	191	117	238	236	282	226	364	837	429	349	237	341	3,847
Unfinished oils	156	107	80	193	109	213	253	317	455	279	244	263	2,669
Total	44,081	41,202	44,166	39,157	43,974	42,902	45,696	43,497	43,636	47,997	40,846	45,597	522,751

[1] Imports of crude reported to the Bureau of Mines; imports of refined products compiled from records of U. S. Department of Commerce; figures may differ slightly from those used in other sections of this chapter.

[2] Preliminary figures.

[3] Formerly included with gasoline.

TABLE 79.—Crude petroleum and petroleum products imported for consumption into continental United States, 1955–56, by countries,[1] thousand barrels

[Bureau of the Census]

Country	Crude petroleum	Gasoline [2]	Kerosine	Distillate oil [3]	Residual oil [3]	Asphalt	Unfinished oil	Miscellaneous oils [4]	Total
1955									
North America:									
Canada	16,395	390	------	37	282	(5)	------	(5)	17,104
Mexico	6,159	------	------	------	13,789	------	2,752	------	22,700
Netherland Antilles	182	[6] 4,748	44	4,320	[6] 86,266	3,314	------	------	[6] 98,874
Trinidad and Tobago	------	105	------	------	416	25	------	------	546
Total	22,736	[6] 5,243	44	4,357	[6] 100,753	3,339	2,752	(5)	[6] 139,224
South America:									
Colombia	8,143	------	------	1	------	------	------	------	8,144
Ecuador	409	------	------	------	------	------	------	------	409
Peru	856	------	------	------	------	------	------	------	856
Venezuela	[6] 148,755	10	------	159	[6] 54,703	12	3,864	------	[6] 207,503
Total	[6] 158,163	10	------	160	[6] 54,703	12	3,864	------	[6] 216,912
Europe:									
France	------	------	------	1	2	------	------	------	3
Germany, West	------	------	(5)	------	------	------	------	(5)	(5)
Italy	------	(5)	------	------	------	------	------	------	(5)
Netherlands	------	------	------	------	------	(5)	------	(5)	(5)
Sweden	------	------	------	------	------	------	------	(5)	(5)
Trieste	------	95	------	------	------	------	------	------	95
United Kingdom	------	------	------	(5)	------	(5)	------	(5)	(5)
Total	------	95	(5)	1	2	(5)	------	(5)	98
Asia:									
Bahrein	------	------	------	114	------	------	------	------	114
Indonesia	11,778	------	------	------	------	------	------	------	11,778
Iran	3,075	------	------	------	------	------	------	------	3,075
Iraq	7,012	------	------	------	------	------	------	------	7,012
Kuwait	56,276	------	------	------	------	------	------	------	56,276
Qatar [7]	5,447	------	------	------	------	------	------	------	5,447
Saudi Arabia	29,609	------	------	457	------	------	------	------	30,066
Total	113,197	------	------	571	------	------	------	------	113,768
Grand total	[6] 294,096	[6] 5,348	44	5,089	[6] 155,458	3,351	6,616	(5)	[6] 470,002
Imports into United States Territories and possessions from foreign countries:									
Alaska	------	7	------	------	------	------	------	------	7
Hawaii	------	------	------	570	92	------	------	------	662
Puerto Rico	2,726	265	44	106	3,257	26	126	------	6,550
Total	2,726	272	44	676	3,349	26	126	------	7,219
Total net imports into continental United States	[6] 291,370	[6] 5,076	(5)	4,413	[6] 152,109	3,325	6,490	(5)	[6] 462,783
1956									
North America:									
Canada	43,227	1,584	1	95	602	6	------	(5)	45,515
Mexico	6,094	------	------	(5)	16,042	------	81	(5)	22,217
Netherland Antilles	791	6,676	230	4,726	86,111	2,875	------	(5)	101,409
Trinidad and Tobago	431	406	------	------	572	14	280	------	1,703
Other North America	------	------	------	------	------	1	------	------	1
Total	50,543	8,666	231	4,821	103,327	2,896	361	(5)	170,845

See footnotes at end of table.

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TABLE 79.—Crude petroleum and petroleum products imported for consumption into continental United States, 1955–56, by countries,[1] thousand barrels—Con.

[Bureau of the Census]

Country	Crude petroleum	Gasoline [2]	Kerosine	Distillate oil [3]	Residual oil [3]	Asphalt	Unfinished oil	Miscellaneous oils [4]	Total
1956									
South America:									
Colombia	9,176				2				9,178
Ecuador	431								431
Peru	614								614
Venezuela	177,199	645		513	60,735	728	3,675		243,495
Other South America	(5)					(5)	(5)		(5)
Total	187,420	645		513	60,737	728	3,675		253,718
Europe:									
Germany, West		(5)	(5)	38				(5)	38
Other Europe		(5)				1		(5)	1
Total		(5)	(5)	38		1		(5)	39
Asia:									
Bahrein					614		525		1,139
Indonesia	13,213								13,213
Iran	6,156								6,156
Iraq	9,880								9,880
Kuwait	52,298								52,298
Qatar [7]	5,995								5,995
Saudi Arabia	29,222		(5)	199	1,083				30,504
Total	116,764		(5)	199	1,697		525		119,185
Oceania: Australia	(5)			1					1
Grand total	354,727	9,311	231	5,572	165,761	3,625	4,561	(5)	543,788
Imports into United States Territories and possessions from foreign countries:									
Alaska		418							418
Hawaii		136		199	1,199				1,534
Puerto Rico	9,257	273	230	212	2,214	18	759	(5)	12,963
Total	9,257	827	230	411	3,413	18	759	(5)	14,915
Total net imports into continental United States	345,470	8,484	1	5,161	162,348	3,607	3,802	(5)	528,873

[1] Compiled by M. B. Price and E. D. Page, of the Bureau of Mines, from records of the Bureau of the Census.
[2] Includes naphtha but excludes benzol (thousand barrels: 1955—764; 1956—1,656).
[3] Includes quantities imported free for manufacture in bond and export, and for supplies of vessels and aircraft.
[4] Includes quantities imported free of duty for supplies of vessels and aircraft.
[5] Less than 1,000 barrels.
[6] Revised figure.
[7] Assumed source; classified in import statistics under "Arabia Peninsular States, n. e. c."

TABLE 80.—Petroleum oils, crude and refined, shipped from continental United States, including shipments to Territories and possessions, 1955–56, by classes and months [1]

(Thousand barrels)

Year and class	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1955													
Crude petroleum	381	976	833	1, 431	1, 166	1, 053	887	1, 191	870	871	872	1, 040	11, 571
Refined products:													
Gasoline [2]	2, 829	2, 280	2, 452	2, 376	3, 077	2, 874	3, 486	3, 199	3, 027	3, 216	2, 686	3, 019	34, 521
Kerosine	232	392	234	309	341	309	442	420	187	175	148	146	3, 335
Distillate fuel oil	1, 993	1, 051	1, 761	1, 632	2, 319	2, 469	2, 379	2, 519	2, 344	2, 603	1, 650	1, 885	24, 605
Residual fuel oil	3, 260	3, 423	2, 764	3, 058	2, 914	2, 998	2, 412	3, 384	2, 607	2, 446	1, 966	2, 567	33, 799
Jet fuel						35	1	44		40			120
Lubricants	948	1, 142	1, 245	1, 268	1, 156	1, 270	1, 350	1, 285	1, 215	1, 123	1, 082	1, 214	14, 298
Paraffin wax	81	108	137	113	95	79	110	111	94	115	102	103	1, 248
Coke	216	292	362	374	317	482	511	446	289	496	345	387	4, 517
Asphalt	89	93	120	97	218	89	136	141	187	144	94	159	1, 567
Liquefied gases	402	357	399	328	366	332	308	347	334	419	390	295	4, 277
Miscellaneous oils	26	34	39	25	22	20	21	30	24	28	28	33	330
Total refined	10, 076	9, 172	9, 513	9, 580	10, 825	10, 957	11, 156	11, 926	10, 308	10, 805	8, 491	9, 808	122, 617
Total crude and refined	10, 457	10, 148	10, 346	11, 011	11, 991	12, 010	12, 043	13, 117	11, 178	11, 676	9, 363	10, 848	134, 188
1956 [3]													
Crude petroleum	994	501	1, 155	610	1, 236	866	748	1, 179	805	1, 444	8, 332	10, 544	28, 414
Refined products:													
Gasoline [2]	2, 753	1, 673	2, 765	2, 735	2, 770	2, 389	3, 321	2, 951	3, 118	2, 946	3, 306	4, 667	35, 394
Kerosine	219	106	94	209	370	217	213	138	84	395	594	681	3, 320
Distillate fuel oil	1, 684	1, 876	1, 737	2, 620	1, 571	1, 937	1, 885	2, 420	2, 330	2, 899	5, 291	8, 142	34, 392
Residual fuel oil	1, 696	1, 616	1, 905	2, 191	2, 313	2, 465	2, 751	2, 662	2, 072	2, 038	2, 692	3, 575	27, 976
Jet fuel				2	15			1	66		2	100	186
Lubricants	1, 069	979	1, 181	1, 262	1, 366	1, 199	1, 092	1, 297	1, 094	1, 122	940	1, 257	13, 858
Paraffin wax	81	76	86	81	75	62	66	75	69	84	64	102	921
Coke	345	486	368	568	648	427	542	729	611	728	577	397	6, 426
Asphalt	65	203	194	125	113	51	248	72	95	116	87	109	1, 478
Liquefied gases	443	337	355	271	288	332	382	418	297	460	337	354	4, 274
Miscellaneous oils	22	26	22	28	27	21	19	31	25	26	21	38	306
Total refined	8, 377	7, 378	8, 707	10, 092	9, 556	9, 100	10, 519	10, 794	9, 861	10, 814	13, 911	19, 422	128, 531
Total crude and refined	9, 371	7, 879	9, 862	10, 702	10, 792	9, 966	11, 267	11, 973	10, 666	12, 258	22, 243	29, 966	156, 945

[1] Compiled from records of the U. S. Department of Commerce, except Alaska and Hawaii, which are Bureau of Mines data; figures may differ slightly from those used in other sections of this chapter.

[2] Includes benzol, naphtha, natural gasoline, and antiknock compounds.

[3] Preliminary figures.

TABLE 81.—Crude petroleum and petroleum products exported from continental United States, 1955–56, by country of destination and shipments to and exports from Territories and possessions[1] in thousand barrels

[Bureau of the Census]

Country	Crude petroleum	Gasoline [2] [3]	Kerosine	Distillate oil	Residual oil	Lubricating oil [2]	Asphalt	Liquefied petroleum gases	Wax	Coke	Petrolatum	Miscellaneous products [2]	Total
1955													
North America:													
Canada	6,501	[4] 2,005	299	7,206	[4] 5,809	804	209	1,353	128	2,448	13	55	[4] 26,830
Canal Zone		173	55	65	223	5	5		(5)		(5)	(5)	526
Cuba	3,136	29	(5)	61	1,564	95	7	153	28		2	15	5,090
El Salvador		241		7	190	6	4	8	5		(5)	2	463
Mexico	(5)	5,826	478	3,879	2,952	167	146	2,271	280	(5)	26	37	16,062
Netherland Antilles		602		849	2,258	10	1				(5)	1	3,721
Other North America		[4] 118	20	149	515	66	43	67	50		4	17	[4] 1,049
Total	9,637	[4] 8,994	852	12,216	[4] 13,511	1,153	415	3,852	491	2,448	45	127	[4] 53,741
South America:													
Argentina	236	(5)	1,060	880		316	1	(5)	2		(5)	1	2,496
Brazil		21	7	90		524	12	326	11	7	5	3	1,006
Chile		4	(5)	6	2,150	69	19	(5)	19		(5)	8	2,275
Colombia		1	1			44	41	6	175		3	14	285
Peru		6				17	1	(5)	28	(5)	1	5	58
Venezuela		7	3			46	5	4	20	(5)	1	24	110
Other South America		10	4	4	188	33	150	1	29		2	11	432
Total	236	49	1,075	980	2,338	1,049	229	337	284	7	12	66	6,662
Europe:													
Belgium-Luxembourg		36	2	82	68	792	4	1	16	56	8	8	1,073
France	546	45		1		65	(5)	2	37	306	6	5	1,013
Germany, West		26	2	356	231	251	(5)	8	21	137	14	6	1,052
Italy	104	138	(5)		3	132	2	1	68	214	10	50	722
Netherlands		23	2	978	[4] 685	350		(5)	25	45	13	21	[4] 2,142
Sweden		56	1	180		282	1	(5)	6	33	2	11	572
United Kingdom	[4] 532	226	289	[4] 5,736	1,018	1,394	(5)	2	67	61	82	(5)	[4] 9,407
Other Europe		79	57	187	39	585	23	(5)	61	393	13	24	1,461
Total	[4] 1,182	629	353	[4] 7,520	[4] 2,044	3,851	30	14	301	1,245	148	125	[4] 17,442

Asia:													
India		56	2	(5)		553	206		1	11	13	12	854
Japan-Nansei and Nanpo Islands	[4] 515	128	(5)	946	9,097	110	9	11	20	732	15	214	[4] 11,797
Malaya		20			300	52	8		(5)		7	4	391
Philippines		5	(5)		47	184	159	10	42	1	10	15	473
Turkey		203	27	21	4	152	3		8		1	10	429
Other Asia		20	(5)	5	145	431	213	(5)	86	19	40	51	1,010
Total	[4] 515	432	29	972	9,593	1,482	598	21	157	763	86	306	[4] 14,954
Africa:													
Belgian Congo		20	1	7	14	52	34		(5)		(5)	11	139
Egypt		(5)	100	(5)		181		(5)	1		4	4	290
French West Africa		6	30	25	97	2	2				(5)	2	164
Union of South Africa		191	1			277	100	3	7	(5)	21	31	631
Other Africa		(5)	25		121	161	60	1	2		5	37	412
Total Africa		217	157	32	232	673	196	4	10	(5)	30	85	1,636
Oceania:													
Australia		338	22	98		527	1	(5)	4		6	1	997
New Zealand		10	1			99	6	3	1		3	(5)	123
Other Oceania		33	8	36	7	(5)	2	(5)			(5)	(5)	86
Total		381	31	134	7	626	9	3	5		9	1	1,206
Grand Total	[4] 11,570	[4] 25,992	2,497	[4] 21,854	[4] 27,725	13,663	1,477	4,231	1,248	4,463	330	830	[4] 115,880
Shipments from continental United States to Territories and possessions:													
Alaska and Hawaii [6]		5,308	144	2,523	5,799	118	20	46	(7)	54	(7)		14,012
Puerto Rico	(7)	2,631	687	389	(7)	73	65	(7)	(7)	(7)	(7)	5	3,850
Wake	(7)	604	(5)	20	(7)	(5)		(7)	(7)	(7)	(7)	(5)	624
Other	(7)	104	13	41	(7)	4	5	(7)	(7)	(7)	(7)	(5)	167
Total		8,647	844	2,973	5,799	195	90	46	(7)	54	(7)	5	18,653
Exports from noncontiguous Territories and possessions to foreign countries:													
Alaska		111	4	218		(5)						(5)	333
Other		8	2	4	1	(5)					(5)	(5)	15
Total		119	6	222	1	(5)					(5)	(5)	348
Total net shipments from continental United States	[4] 11,570	[4] 34,520	3,335	[4] 24,605	[4] 33,523	13,858	1,567	4,277	1,248	4,517	330	835	[4] 134,185

See footnotes at end of table.

TABLE 81.—Crude petroleum and petroleum products exported from continental United States, 1955–56, by country of destination, and shipments to and exports from Territories and possessions [1] in thousand barrels—Continued

Country	Crude petroleum	Gasoline [2] [3]	Kerosine	Distillate oil	Residual oil	Lubricating oil [2]	Asphalt	Liquefied petroleum gases	Wax	Coke	Petrolatum	Miscellaneous products [2]	Total
1956													
North America:													
Canada	5,570	1,602	573	6,554	6,573	851	263	1,316	137	2,606	12	61	26,118
Cuba	3,262	105	2	344	1,673	92	17	200	31		1	16	5,743
El Salvador		214		14	110	6	11	22	6		(5)	3	386
Mexico		6,014	844	3,938	3,090	127	172	2,114	108		28	50	16,485
Netherland Antilles		2,857		2,976		36	1				(5)	(5)	5,870
Other North America		105	28	203	553	80	79	123	52	(5)	4	15	1,242
Total	8,832	10,897	1,447	14,029	11,999	1,192	543	3,775	334	2,606	45	145	55,844
South America:													
Argentina		(5)	473	739	323	297	5	25	2	31		2	1,897
Brazil		7	29	79	321	558	4	442	14	17	8	7	1,486
Chile		3	1	15	865	67	21	2	27		7	8	1,016
Colombia		3	(5)			35	25	4	156		2	9	234
Peru		12				16	(5)	(5)	15		1	6	50
Venezuela		61	(5)	(5)		58	5	2	28		2	27	183
Other South America		9	6	2		30	53	(5)	31	(5)	1	9	141
Total		95	509	835	1,509	1,061	113	475	273	48	21	68	5,007
Europe:													
Belgium-Luxembourg	1,020	199	1	673	402	735	3	(5)	12	735	7	10	3,797
France	6,787	483	2	378	485	65	(5)	1	40	296	7	4	8,548
Germany, West	2,151	61	3	206	263	312	(5)	(5)	19	319	11	7	3,352
Italy	1,038	251	(5)	57	216	118	1	3	10	216	10	43	1,963
Netherlands	1,824	143	117	2,463	198	302	(5)	1	26	56	9	14	5,153
Sweden	199	155	90	969	92	375	1	(5)	7	46	1	10	1,945
United Kingdom	5,238	489	282	7,069	1,412	1,308		1	57	51	67	1	15,975
Other Europe	249	243	59	1,008	306	498	43	1	32	605	6	20	3,070
Total	18,506	2,024	554	12,823	3,374	3,713	48	7	203	2,324	118	109	43,803
Asia:													
India		7	1			527	14		2	11	12	9	583
Japan-Nansei and Nanpo Islands	1,055	213	(5)	2,987	4,812	239	7	7	22	1,282	26	195	10,845
Malaya		145				68	10		1		4	4	232
Philippines		14	(5)	41		200	99		22		9	18	403

Turkey		227	204	280		206			1		[5]	11	929
Other Asia		62	75	148	60	428	196	2	37	76	36	50	1,170
Total	1,055	668	280	3,456	4,872	1,668	326	9	85	1,369	87	287	14,162
Africa:													
Belgian Congo		6	1		14	39	50		[5]		1	8	119
Egypt		3				168			[5]			4	175
French West Africa		63	29	59	121	3	2					2	279
Union of South Africa		56	[5]	6		228	111	7	17		23	27	475
Other Africa	122	97	45	507	249	104	82	[5]	1		3	18	1,228
Total	122	225	75	572	384	542	245	7	18		27	59	2,276
Oceania:													
Australia		19	1	67		635	[5]	[5]	5	29	6	1	763
French Pacific Islands		22	8	38	9	[5]	1	[5]				[5]	78
New Zealand		13	1			102	18	1	2		3	[5]	140
Other Oceania		10	1	[5]							[5]		11
Total		64	11	105	9	737	19	1	7	29	9	1	992
Grand total	28,515	28,202	2,876	31,820	22,147	13,217	1,294	4,274	920	6,376	307	851	140,799
Shipments from continental United States to Territories and possessions:													
Alaska and Hawaii [6]		5,247	139	2,667	6,276	129	80		[7]	46	[7]	3	14,587
Puerto Rico	[7]	1,482	268	187	[7]	75	121	[7]	[7]	[7]	[7]	5	2,138
Wake	[7]	697	[5]	26	[7]	[5]	7	[7]	[7]	[7]	[5]	[5]	730
Other	[7]	99	15	72	[7]	9	12	[7]	[7]	[7]	[7]	[5]	207
Total		7,525	422	2,952	6,276	213	220	[7]	[7]	46	[7]	8	17,662
Reports from noncontiguous Territories and possessions to foreign countries:													
Alaska		111	[5]	337	[5]	[5]						1	449
Other		25	2	2	791	[5]	[5]	3			[5]		823
Total		136	2	339	791	[5]	[5]	3			[5]	1	1,272
Total net shipments from continental United States	28,515	35,591	3,296	34,433	27,632	13,430	1,514	4,271	920	6,422	307	858	157,189

[1] Compiled by M. B. Price and E. D. Page, of the Bureau of Mines, from records of the Bureau of the Census.

[2] Country and continent totals exclude, but grand totals include: 1955—15,290 (revised figure); 1956—14,229 thousand barrels of aviation gasoline; 1955—4,829 (revised figure); 1956—4,304 thousand barrels of lubricating oils; and 1955—120, 1956—182 thousand barrels of jet fuel for which country breakdown may not be published for security reasons.

[3] Includes naphtha but excludes benzol (thousand barrels): 1955—59; 1956—65.

[4] Revised figure.

[5] Less than 1,000 barrels.

[6] Figures represent shipments from refining companies to Alaska and Hawaii through Pacific coast ports as reported to Bureau of Mines by shippers.

[7] Not separately classified.

WORLD PRODUCTION[2]

In 1956 world production of crude petroleum reached 6.1 billion barrels (16.7 million barrels daily), compared with 5.6 billion in 1955.

With respect to the Free World, the major producing countries (United States, Venezuela, Kuwait, Iraq, Saudi Arabia, and Iran) produced 4.7 billion barrels as against 4.4 billion in 1955. The 1956 production of this major group represented 76.9 percent of the world output during the year—a slight drop from 1955 occasioned primarily by gains in other areas.

Total Middle East (Bahrain, Egypt, Iran, Iraq, Israel, Kuwait, Neutral Zone, Qatar, Saudi Arabia, and Turkey) production was 1.3 billion barrels in 1956—a 6.3-percent gain, despite the drop in production in several countries in the last quarter of 1956 resulting from the hostilities in Egypt. Middle East production represented 20.8 percent of world output in 1956, compared with 21.3 during 1955.

With respect to individual countries in the various broad regional groups, in the Western Hemisphere the United States increased production 5.3 percent to 2.6 billion barrels in 1956. Output in Canada rose 33.0 percent to 172 million barrels, reflecting increased production in the western part of the country. Mexico showed a fairly small gain. Argentina produced 31 million barrels—a slight gain over 1955. Y. P. F.—the Government oil agency—showed a small increase, compared with a negligible decline in production by other operators. Venezuela increased production 14.0 percent in 1956 to 899 million barrels. An important development during the year in Venezuela was the granting of new concessions, totaling 745,500 acres.

In western Europe Germany continued during 1956 as the largest producer, output amounting to 25 million barrels, an increase of 13.3 percent. Output in Austria—the next largest producer—dropped slightly to 24 million barrels. Production in France reached 9 million barrels (a 50-percent gain) which primarily reflected the continuing climb of output of Esso-Standard's Parentis field. Italy's production almost trebled to reach 4 million barrels, as Gulf Italia continued development of its Ragusa field in Sicily.

Production in eastern Europe, based on data derived almost entirely on statements from government agencies in that region, amounted to 710 million barrels in 1956, an increase of approximately 17.0 percent. The term "eastern Europe" comprises U. S. S. R., Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Rumania, and Yugoslavia. Production in U. S. S. R. increased 20.0 percent to 612 million barrels, representing 86.0 percent of the eastern Europe group. Outside the U. S. S. R., production during 1956 in the various countries showed no significant changes, except that production in Hungary declined 25.0 percent.

In the Middle East production in Iraq (233 million barrels) declined 7.3 percent, reflecting fighting in Egypt in the last quarter of the year and the sabotage in Syria of several pumping stations which had been delivering crude from the Kirkuk field to the Mediterranean. Iranian production rose to 197 million barrels. A major discovery occurred in central Iran near Qum when an exploratory well drilled

[2] By J. V. Hightower.

TABLE 82.—World production of crude petroleum, by countries, 1952–56,[1] in thousand barrels

[Compiled by Pearl J. Thompson]

Country	1952	1953	1954	1955	1956 [2]
North America:					
Canada	61,237	80,899	96,080	129,440	172,005
Cuba [3]	36	17	25	375	543
Mexico	77,275	72,440	83,653	89,406	90,660
Trinidad	21,258	22,346	23,629	24,896	28,929
United States	2,289,836	2,357,082	2,314,988	2,484,428	2,617,432
Total	2,449,642	2,532,784	2,518,375	2,728,545	2,909,569
South America:					
Argentina	24,588	28,501	29,573	30,501	31,024
Bolivia	526	601	1,695	2,693	3,196
Brazil	750	916	993	2,022	4,059
Chile	910	1,258	1,736	2,577	3,542
Colombia	38,683	39,431	39,981	39,711	44,968
Ecuador	2,839	3,040	3,146	3,599	3,420
Peru	16,403	15,999	17,162	17,242	18,383
Venezuela	660,254	644,243	691,810	787,409	899,212
Total	744,953	733,989	786,096	885,754	1,007,804
Europe:					
Albania	994	994	1,168	1,388	1,935
Austria	18,760	21,860	23,400	24,886	23,619
Bulgaria	----	----	----	1,103	1,691
Czechoslovakia	[4] 1,228	[4] 1,329	[4] 1,100	950	949
France	2,377	2,555	3,616	6,224	9,346
Germany, West	12,435	15,505	19,008	22,435	25,408
Hungary	4,563	6,455	9,286	12,216	9,172
Italy	488	655	535	1,519	4,208
Netherlands	4,975	5,701	6,535	7,126	7,652
Poland	[4] 1,600	1,400	1,363	1,334	1,363
Rumania	[4] 58,900	[4] 67,800	[4] 73,000	79,002	81,238
U. S. S. R.[5]	340,560	380,160	426,960	509,760	611,740
United Kingdom	407	410	450	408	496
Yugoslavia	1,091	1,236	1,557	2,027	2,076
Total [5]	[4] 448,378	[4] 506,060	[4] 567,978	670,378	780,893
Asia:					
Bahrein	11,004	10,978	10,992	10,982	11,016
Burma	869	1,051	1,345	1,592	1,420
China [4]	1,000	1,500	3,000	3,500	4,700
India	1,900	2,215	2,235	2,526	2,876
Indonesia	62,495	75,626	79,586	87,083	93,820
Iran	7,800	9,400	21,500	120,562	197,148
Iraq	141,100	210,268	228,432	251,206	233,302
Israel	----	----	----	----	146
Japan	2,134	2,101	2,124	2,229	2,169
Kuwait	273,433	314,592	347,319	398,493	399,874
Kuwait-Neutral Zone	----	----	5,995	8,848	11,684
Pakistan	1,580	1,762	1,945	2,068	2,118
Qatar	25,255	31,025	36,450	41,983	45,300
Sarawak and Brunei	38,251	36,848	36,315	39,751	42,983
Saudi Arabia	301,861	308,294	347,845	352,240	360,923
Taiwan (Formosa)	18	17	35	24	21
Turkey	146	179	399	1,205	2,075
Total [5]	868,846	1,005,856	1,125,517	1,324,292	1,411,574
Africa:					
Algeria	348	638	570	438	253
Angola	----	----	----	----	52
Egypt	16,464	16,501	13,774	12,634	11,929
French Morocco	749	761	881	765	734
Total	17,561	17,900	15,225	13,837	12,968
Oceania:					
New Guinea	1,725	1,751	4,045	3,413	2,610
New Zealand	9	8	7	6	7
Total	1,734	1,759	4,052	3,419	2,617
World total (estimate)	4,531,114	4,798,348	5,017,243	5,626,225	6,125,425

[1] This table incorporates a number of revisions of data published in previous Petroleum chapters.
[2] Preliminary figures.
[3] Natural naphtha and gas oil.
[4] Estimate.
[5] U. S. S. R. in Asia (including Sakhalin) included with U. S. S. R. in Europe.

by National Iranian Oil Co. blew out in August at an estimated rate of around 90,000 barrels daily and remained uncontrolled until November. First commercial production—146,000 barrels—occurred in Israel during 1956 as result of discovery of the Heletz field in 1955. Twelve development wells (seven of them producers) were completed during 1956. Production in Saudi Arabia gained 21,000 barrels daily. A prolific new field was discovered on the Persian Gulf about 40 miles north of Ras Tanura.

New productive areas were disclosed in Africa during the year. In the Algerian Sahara region discoveries of light crude in commercial quantities were made in several localities. Angola became a producing country for the first time through production from the Benfica field. A new field was established at Luanda in the same country. Two commercial fields in the coastal salt-dome area of Gabon were developed in French Equatorial Africa. Fourteen development wells were completed—10 of them as producers. Crude was accumulated for the first shipment to France early in 1957. Production in Egypt—12 million barrels—declined 5.6 percent in 1956 following the outbreak of fighting near the end of the year. The Belayim area was established as a major field.

Production in the Far East increased moderately. Indonesia increased its output 7.8 percent to 94 million barrels, largely due to a 45.0-percent rise in the Caltex Minas field in central Sumatra. British Borneo production—43 million barrels—rose 8.1 percent during the year. Drilling offshore near the Seria field indicated the probability of appreciable productiveness in the area. Production in New Guinea dropped 25.0 percent. Eight exploratory wells drilled during 1956 failed to yield encouraging results. Production in India increased 13.8 percent to about 3 million barrels. Considerable exploratory work was under way during the year, including surveys in the Bengal alluvial basin.

PETROLEUM TECHNOLOGY[3]

EXPLORATION FOR NEW RESERVES

Activities of the oil industry in exploration and development of petroleum reserves in the United States reached record levels in 1956. These activities have increased despite the necessity, over the long term, to drill deeper in a constantly diminishing unexplored area. In 1956 the successful well percentage in new field exploration was slightly less (9.97 percent) than for 1955 (11.32 percent). The average percentage for the 13-year period 1944–56, inclusive, was 11.17 percent.[4]

During the year 1956, 16,173 exploratory wells were drilled. Of these, 3,096 were successful producers, and 13,077 were dry. The average depth of exploratory wells was 4,574 feet. Except for 1955, when the average exploratory-well depth was 4,631 feet, a constantly increasing deeper drilling trend each year is evident for the past 10 years, beginning with 3,404 feet in 1947.[5]

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[3] By J. D. Lankford, chemical engineer, staff assistant, Division of Petroleum.
[4] Bull. American Association of Petroleum Geologists, vol. 41, No. 6, June 1957, pp. 989–1005.
[5] American Gas Association and American Petroleum Institute, Proved Reserves of Crude Oil, Natural-Gas Liquids, and Natural Gas, vol. 9, 1954, 22 pp.

The total wells of all types drilled in the Nation were 58,160,[6] an alltime record.

The continued high level of activity and almost constant success percentage in the exploratory effort in great measure has been due to technologic improvements in exploration, drilling, completion, and producing procedures. Significantly, 84 percent of the new field exploratory wells were located on technical advice, including various geological and geophysical techniques.[7] Technologic developments have offset some unfavorable aspects of the exploration effort, such as deeper drilling, fewer attractive unexplored areas, and higher costs of equipment, materials, and labor.

According to data recently published,[8] 150 wells were drilled to a depth exceeding 15,000 feet in 1956 compared with 100 in 1955 and 59 in 1954. By virtue of better drilling equipment, drilling muds, and techniques, the average cost per foot remained within the range $40–$42 per foot. Drilling-time averages diminished from 182 days to 150, and average number of bits used was reduced from 116 in 1954 to 86 in 1955 and 88 in 1956. To the end of 1956 a cumulative total of 401 wells had been completed at depths below 15,000 feet, of which 198 were producers. A deepest well record was set in 1956, when a well was drilled to 22,570 feet on the Louisiana coast.[9] A well, completed as a producer at 21,465 feet, also set a record [10] as the deepest producer, demonstrating that enough porosity and permeability were present to allow movement of oil from sediments under very great overburden.

Improvements in offshore drilling equipment continued throughout 1956. Marine yards engaged in building mobile drilling barges, platforms, and related equipment remained active. The trend has been toward offshore deep-drilling equipment (20,000–25,000 feet) having standardized diesel-electric-drive units with automatic controls for smoother power application and increased flexibility.

Increased penetration rates through the use of jet drilling, high mud-circulation rates, better drilling muds, better bits, drill collars and stabilizers, and stronger steels occurred in 1956. The rate of increase continued to diminish, however, and there was growing awareness of the need for new methods to improve drilling efficiency. One approach that received continued experimental study was the rotary-percussion drill, which imparts both rotative and percussive motion to the drill. Increasing use also was made of gas and air instead of mud for both drilling and coring and diamond bits, especially for hard formations.

The "Turbo-drill," which utilizes a turbine driven by mud at the bottom of the hole, was introduced by one of the equipment companies.[11] This type of drill has been known for many years; but, because of mechanical troubles and the high cost of development, had not received much attention in this country because more profitable ways of improving drilling received the major attention of the industry. Foreign development work, state-financed, reduced many of the

[6] Oil and Gas Journal, vol. 55, No. 4, Jan. 28, 1957, p. 145.
[7] See footnote 4, p. 182.
[8] Petrol. Eng., vol. 29, No. 3, p. B-22.
[9] See footnote 4, p. 182.
[10] See footnote 4, p. 182.
[11] See footnote 4, p. 182.

turbine-driven bit troubles, notably antifriction bearing wear and erosion. Through arrangements with foreign developers the bit was brought to the United States and was adapted to American design and manufacturing practice; initial trials appeared promising. It is claimed that the Turbo-drill is especially suited to hard-rock drilling, where greatly improved penetration rates are obtained.[12]

DISCOVERIES

Discovery of new reserves kept pace with demand in 1956, mainly because of the willingness and ability of the industry to explore for reserves by deep drilling. New fracturing techniques also were employed to develop both shallow and deep production, which formerly was or would have been passed up as noncommercial because of tight formations.

Some of the most significant activities in discovery and exploration in 1956 were: (1) The emergence of the Paradox basin of Utah as a major oil-producing area; (2) the record deep-drilling and deep-production records established in Louisiana; (3) discovery of oil in piercement-type salt domes in East Texas, which previously had been considered barren—these discoveries altered geological theory and opened numbers of other salt-dome areas for reconsideration for exploration; (4) discovery of regional stratigraphic traps in the northwestern New Mexico San Juan basin; (5) expansion of Cretaceous reserves in deep drilling below 10,000 feet and extension of the 50-mile trend in southwest Texas; (6) enlarged exploration activity in the Anadarko basin of Texas, Oklahoma, and Kansas; (7) discovery of oil in the formerly dry area of the Las Animas arch in eastern Colorado; and (8) development of the Citronelle field in Alabama into a major oil producer within 9 months of discovery.

Deep drilling in 1956 was most effective in discovering new reserves in the South Louisiana area and in adjacent offshore operations. The second most favorable place to drill, 1956 records show,[13] was in the Rocky Mountains (the Paradox basin of Utah, where 16 fields were discovered in 1956 accounted for much of this), with Texas third. The least favorable locality for drilling was Illinois. Barrels of oil discovered per foot of hole drilled were: Louisiana 76, Rocky Mountain 40, Texas 28, and Illinois 12. These figures include all operations and are computed on the basis of energy equivalents for wells producing natural gas and gas liquids. Continued improvement in equipment, drilling muds, and offshore drilling platforms and equipment, together with more extensive geologic and seismic surveys, particularly to reappraise old structures, contributed substantially to the success of these operations.

DEVELOPMENTS IN REFINING

Refinery operations in the United States in 1956 were increased to record proportions. Accompanying these operations was the continuing trend to produce greater amounts of distillate materials from the crude. There was a simultaneous trend to produce higher octane gasoline to meet the continuing higher octane requirements in motor

[12] See footnote 4, p. 182.
[13] See footnote 4, p. 182.

gasoline. Indicative of the increasing trend are the national average octane numbers over several years. In the winter of 1951–52 the average research octane number of regular price gasoline was 83.1. This increased to 88.8 in the summer of 1956. For premium-price gasoline the increase was 6.4 octane numbers—from 90 in the winter of 1951 to 96.4 in the summer of 1956.[14] [15]

A greater proportion of crude was converted to distillate materials through use of coking processes and catalytic cracking processes for heavier gas oils and some residual oils. Greater use was made of hydrogenation to desulfurize distillate and residual fractions. Growing interest was shown, and experimental work was carried on in hydrogenation and hydrocracking residual oils, not only for desulfurization but also to prepare upgraded distillates.

In 1956 higher octanes and jet-fuel demands, coupled with technologic developments, caused shifts in gasoline and distillate processing. The largest change in installed capacity, both in percentage and quantity, was catalytic hydrogen treating, which more than doubled during the year from 433 to 879 thousand barrels a day capacity, representing 10 different processes. Three new processes were installed—Sovafining, Gulfining, and Platreating. Catalytic re-forming capacity increased about a one-third from 926 to 1,248 thousand barrels a day, and 2 new processes, Isoplus and Rexforming, were installed. Alkylation capacity was increased only moderately—from 263 to 273 thousand barrels a day.

Catalytic cracking remained at the end of the year as the gasoline process having the greatest installed capacity (3,988 thousand barrels a day)—an increase during 1956 of 279 thousand barrels. Increased interest also was shown in isomerization of pentane, hexane, and heptane fractions. In addition to processes for butane isomerization, at the end of 1956 there were six established processes for isomerizing C_5, C_6, and C_7 stocks. Two of these processes employed platinum catalysts, 1 a nonnoble-metal catalyst, another a nonplatinum noble-metal catalyst, 1 an aluminum chloride hydrocarbon complex, and 1 hydrogen chloride.[16]

A substantial amount of research work and development was carried on in the investigation of catalysts for use in isomerization processes. Isomerization in conjunction with catalytic hydrogen treating, alkylation, and catalytic re-forming adds to the wide variety of processes for converting low- or medium-octane fractions to motor fuel of high octane value.

As examples [17] of the effect of isomerization on a mixture of pentane feed stocks, an increase of 14 octane numbers, from 76.4 to 90.4, F–1 clear, was obtained; with 3 ml. tetraethyl lead (TEI). The increase from 94.5 to 104.2 was 9.3 numbers. Corresponding data on once-through mixed hexane feed stocks were 60 to 75 clear and 83 to 94 with 3 ml. TEL. By recycling low-octane materials from once-through isomerizing a mixed C_5–C_6 feed (70 research octane number, clear) a combined product can be produced having a research octane number with 3 ml. TEL of 101.

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[14] Blade, O. C., National Motor Gasoline Survey, Summer 1956: Bureau of Mines Inf. Circ. 7746, 1956, p. 1.
[15] Blade, O. C., National Motor Gasoline Survey, Winter 1956–57: Bureau of Mines Inf. Circ. 7796, 1957, p. 1.
[16] Oil and Gas Jour., vol. 55, No. 4, Jan. 28, 1957, p. 176.
[17] Oil and Gas Jour., Process Sec., vol. 55, No. 12, Mar. 25, 1957, p. 156.

Upgrading of high-sulfur distillates is readily accomplished by catalytic hydrogen treatment, which grew appreciably during 1956. For example, a Wyoming diesel oil, having 2.1 weight-percent sulfur, after catalytic hydrogen treatment had only 0.14 weight-percent sulfur without substantial change in boiling range. The cetane number was raised from 46 to 52. Such treatment found use in a wide variety of stocks, both straight-run and cracked, from naphthas to 900° F. plus end-point vacuum heavy gas oils.

Catalytic re-forming can be used for upgrading naphthas and also to produce aromatic chemicals. As an example, a West Texas naphtha having a research clear octane number of 52.5, when re-formed by one of the recently developed processes, was converted to a re-formate product having a clear octane number of 98.2—an increase of 45.7. Addition of 3 ml. TEL resulted in a product having an octane number of 103.4. Re-forming this naphtha increased the aromatic content from 9.7 to 64.2 percent by volume.

The foregoing examples demonstrate reasons for the great increases in catalytic re-forming and treating processes during 1956.

Growing demands for jet fuel (14 percent over 1955 and 39 percent over 1954) drew heavily on gasoline and kerosine as blending stocks. Slightly over ¾ of jet fuel base stock came from gasoline-boiling-range materials, about ⅙ from kerosine, and the remainder from other distillates. This utilization placed added emphasis on refiners to prepare proportionately greater amounts of naphtha from crude.

Total daily coking capacity at the end of 1956 (454,000 barrels) was about 23 percent fluid coke equipment. At the beginning of the year the figures were 338 thousand barrels per day and 4.1 percent fluid plants. With greater use of fluidized coking techniques to prepare more distillates from residual oils has been a corresponding increase in the amount of fluidized coke produced. Petroleum coke from delayed coking units long has been used to manufacture electrodes for aluminum reduction. Fluidized coke, in pelletized form, experimentally has been found to be suitable for manufacturing aluminum electrodes in blends with delayed coke containing as much as 30 percent of fluid coke.[18] This and other metallurgical uses under investigation may prove important to producers of byproduct petroleum-coke producers.

Significant in the trend toward production of more distillate materials, higher octane gasoline, diminished production of residual oils, and utilization of lower quality crudes, such as sour Middle East crudes, was a large refinery nearing completion on the east coast. The Tidewater Oil Co. refinery at Delaware City, Del., was virtually completed in 1956. This plant was designed to process 130,000 barrels per day of sour Middle East crude. It was especially significant, because it was the first refinery of this size in which all units were built simultaneously and interrelated to process a particular type of crude and yet incorporate broad latitude in type and quality of fuel product. Flexibility was built in so that, if circumstances warrant, the crude could be converted entirely to two products, gasoline (with a pool octane number nearing 100) and coke. Incorporated in the plant were the latest automation techniques including continuous

[18] Petrol. Refiner, Process Developments Issue, September 1957, p. 214.

stream analysis, integrated process control by use of electronic computers, automatic product transfer, quality control, and tank gaging.

The fluidized coke from this refinery is to be transported directly to an adjacent powerplant for use as boiler fuel. The mode of operation of the refinery, however, can be changed from producing maximum gasoline to the production of a full range of fuels such as residual fuel oil, burner fuels, kerosine, jet fuels, and gasolines of aviation, premium and regular grades to suit market conditions.

RADIATION PROCESSING

Stepped-up interest was shown in 1956 in radiation processing of petroleum, that is, utilization of the radiation to initiate or control hydrocarbon reactions, now difficult or impossible to obtain by heat, pressure, and catalysts. No actual processing plants using radiation were constructed, but considerable work was underway in research laboratories directed toward the possible use of "byproduct" irradiation that might become available from atomic-energy powerplants being constructed or considered. Improvements were made in the use of radioactive isotopes in various process operations, such as in tracers for catalysts, in various process streams, and as markers between products in product pipelines. Radioactive isotopes were also being used more widely in such operations.

LUBRICANTS AND ADDITIVES

Lubricating oils in 1956 exhibited the continuing trend away from straight mineral oils through the use of additives of several types. These include Viscosity Index improvers, over half of which are polymethacrylates and detergents, the bulk of which are about evenly divided between sulfonates and phenates, antioxidants, corrosion inhibitors, defoamers, pour-point depressants, and oiliness and extreme pressure agents. These materials are finding constantly greater acceptance. They have become, in most instances, quite necessary because of the more severe service conditions imposed by engines of high speed and high compression ratio with consequent greater volumetric efficiency, horsepower, closer tolerances between moving parts, heavier bearing pressures and higher operating temperatures.

Although the amounts added to lubricants by percents are small, the total volume of additive chemicals was estimated [19] at about 600 million pounds having a value of about 150 million dollars.

PETROCHEMICALS

Increasing octane requirements for motor gasoline in 1956 drew heavily on high-octane materials resulting from catalytic re-forming processes. The aromatics (benzene, toluene, and xylenes) which might be recovered from reformate for marketing as petrochemicals, were needed increasingly as high-octane blending materials in gasoline. These products (unless separated and sold as petrochemicals) normally are not considered as such and are included in fuel production.

[19] Petroleum Refiner, vol. 35, No. 5, May 1956, p. 235.

Some idea of the high-octane blending value of these aromatics may be gained by examining their clear octane-number ratings: Benzene 99, toluene 124, o–xylene 120, m–xylene 145, and p–xylene 146.

The petrochemical industry is an integrated part of the petroleum and chemical industries. In the Journal of Petroleum Processing for September 1957, data are given showing that, although the volume of petrochemical products (36 billion pounds in 1956) is small compared with the volume of fuels and lubricants, it is substantial in value—1956 output value was $4.27 billion. Comparison with the chemical industry production shows that petrochemicals in 1956 were 24.3 percent by weight and 57.7 percent by value of all chemicals. Growth of petrochemical output has been phenomenal; since 1940 the industry output has increased 900 percent. The rate of growth continued in 1956 at a rate 11.8 percent above 1955.

Aside from ammonia and carbon black, the most important petrochemical basic materials are ethylene, propylene, propane, butadiene, butylene, and toluene. Of these, ethylene and butadiene were noteworthy for expansion in 1956. Ethylene (3.5 billion pounds in 1956—3.05 billion pounds in 1955) is used for manufacturing polyethylene, tetraethyl-lead, ethanol, ethylene oxide, styrene, and ethyl chloride. Acetylene use increased in 1956 and substantially in the preceding year. This two-carbon atom compound is closely related chemically to ethylene and, like it, is very reactive. It is usable in a large number of syntheses; some of these growing uses compete with ethylene. Acetylene was employed extensively in the acrilonitrile field as starting material for synthetic fibers and plastics, vinyl chloride, neoprene, and nitrile rubbers. Technology and economics cause rapid shifts in petrochemicals.

Butadiene capacity increased 42 percent during 1956 to bring the total installed capacity to 1.06 million tons a year. All of the increase was in plants utilizing the Houdry Dehydrogenation Process and normal butane as feed stock. Butadiene formerly was produced almost exclusively from refinery byproduct butylenes. Butylenes in some cases found more profitable uses in refineries as charge stock to produce high octane gasoline by alkylation. Some refiners were considering normal butane to butylene to serve as alkylation plant feed stock to supplement byproduct butylene.

C. Helium

Helium

By Mary K. Royston and Henry P. Wheeler, Jr.

GENERAL SUMMARY

THE SECRETARY of the Interior, acting through the Bureau of Mines, is responsible under the Helium Act for conserving, producing, and selling helium. The Bureau of Mines operates 4 plants—1 each at Amarillo and Exell, Tex.; Otis, Kans.; and Navajo (Shiprock), N. Mex.

Record shipments of 267 million cubic feet of helium in 1956 met all Federal and medical requirements and, for the most part, those of private industry. However, the close balance between supply and demand again made necessary an informal allocation system to assure that defense and medical requirements were fulfilled in preference to less essential uses.

Work was well under way toward completion of additional production facilities at the helium plant at Exell, Tex., by the end of the year. When completed, the new facilities will produce an additional 150 million cubic feet of helium annually.

The continually increasing demand for this essential mineral resource makes its conservation a matter of prime importance in future helium programs.

PRODUCTION

Helium production reached an alltime high of 243,879,700 cubic feet in 1956. All 4 plants were operated throughout the year to set this production record, which exceeded that in the previous record year (1955) by 10.5 percent.

Even such record-breaking production could not meet the increasing demands. To augment this production, 24,865,000 cubic feet of helium, which had been conserved by the Bureau of Mines in previous years, was withdrawn from underground storage in the Government-owned Cliffside field (near Amarillo), to make a total of 268,744,700 cubic feet available for distribution in 1956.

The Exell plant was being expanded during 1956. Work began when the architect-engineer was awarded the contract in August 1954; construction was expected to be completed by the end of April 1957. The new facilities will produce an additional 150 million cubic feet of helium annually. To make enough helium-bearing natural gas available to the Exell plant for the new units, the supplier began in September to rearrange and expand its field gathering pipeline system. Most of this work was completed at year end, and little remained to do other than to make the tie-ins with existing facilities.

The water supply and cooling systems at the Navajo plant were improved during the year. A decision was made to install a nitrogen-removal unit in the Amarillo plant. Operating efficiency will be increased at both plants by these additions.

SHIPMENTS

The Bureau of Mines shipped 266,937,100 cubic feet of helium in 1956. Of this total, 188,354,500 cubic feet went to Federal agencies, and 78,582,600 cubic feet went to non-Federal customers. This quantity comprised 964 tank-car, 135 trailer, and 262,205 cylinder shipments.

To facilitate transporting helium, the Bureau of Mines agreed to convert 45,000 carbon dioxide cylinders to helium service for the Navy and had converted 20,500 of them by the end of the year. The Navy also agreed to forego its right to repossess 30,431 helium cylinders from the Bureau of Mines, making them available for all-round use. Tank-car round-trip time was reduced to nearly half of what it had been before. Thus, helium was delivered without undue delay, although the first major repairs in 25 years were made to 85 tank cars out of the pool of 107.

TABLE 1. Helium production in the United States, 1921–56

Year	Active plants	Production (cubic feet)
1921–January 1929 [1]	Fort Worth, Tex	46,088,800
1929–(April) 1942	Amarillo, Tex	164,867,100
1943	Amarillo and Exell, Tex., and Otis, Kans	116,307,400
1944	Amarillo and Exell, Tex., Otis and Cunningham, Kans., and Navajo (Shiprock), N. Mex	126,933,100
1945	Amarillo and Exell, Tex., and Otis and Cunningham, Kans	94,733,700
1946	Amarillo and Exell, Tex	58,236,400
1947	Exell, Tex	70,297,700
1948	do	63,143,500
1949	do	55,165,500
1950	Amarillo and Exell, Tex	81,394,400
1951	Amarillo and Exell, Tex., and Otis, Kans	112,009,200
1952	do	144,556,100
1953	Amarillo and Exell, Tex., Otis, Kans., and Navajo (Shiprock), N. Mex	161,086,800
1954	do	190,741,400
1955	do	220,710,600
1956	do	243,879,700
Total		[2] 1,950,151,400

[1] No helium was produced at Government helium plants in February or March 1929. The Fort Worth plant was shut down January 19, 1929, and the Amarillo plant was not put into operation until April.

[2] Includes 46,360,000 cubic feet extracted at the Exell plant and injected into the Government-owned Cliffside gas field for conservation, in excess of that subsequently withdrawn.

CONSUMPTION AND USES

Approximately 90 percent of the total helium consumed was for the benefit of the Government. Federal agencies took 71 percent directly. Non-Federal customers received the remainder (29 percent), and over half of it was used on Government contracts.

The Department of the Navy continued to lead in use of helium; other Federal agencies following in order were: The Atomic Energy

Commission, Department of the Air Force, Weather Bureau, National Advisory Committee for Aeronautics, Department of the Army, Bureau of Mines, and the National Bureau of Standards.

The most common use of helium was to fill airships and meteorological balloons; however, the physical properties of the 99.995-percent product (as it was produced exclusively from all 4 plants) have made it technologically valuable in shielded-arc welding, titanium and zirconium production, leak detection, growth of germanium and silicon crystals for transistors, in many fields of Government, medical, and industrial research and in atomic energy and guided-missile operations.

The properties of helium also make its use in medicine important. Mixed with oxygen, it aids the breathing of victims of asthma and other respiratory ailments, and it reduces anoxia and combats caisson disease (commonly called the "bends") in deep-sea diving. Mixed with flammable anesthetic gases, it reduces the hazard of explosion.

Small quantities were used to inflate toy balloons, for advertising purposes, and for other miscellaneous uses. Such uses have been discouraged during periods of shortage.

An informal allocation system was again in use in the early spring and was continued throughout the year because steadily increasing demands exceeded the supply. Federal agencies cooperated with the Bureau of Mines during this period by voluntarily reducing their own helium usage so that important private defense requirements could be met.

PRICES

The Helium Act (50 Stat. 885; 50 U. S. C. 161, 163–166) provides that Federal agencies may requisition helium from the Bureau of Mines by paying proportionate shares of the expenses incident to the administration, operation, and maintenance of the Government helium plants and properties. The price to Federal users in 1956 was $15.50 per thousand cubic feet. The price to non-Federal users was $19.00 per thousand cubic feet. A compressing charge of $2.00 per thousand cubic feet was made for helium supplied in standard-type cylinders (30 C. F. R. 1, Regulations Governing the Production and sale of Helium).

RESERVES

Helium is produced from helium-bearing natural gas. The Bureau of Mines has been studying the Nation's natural-gas occurrences to determine the helium content since 1917. The study has shown that appreciable quantities of helium (usually less than 1 percent) are found only in some natural gases in the southwestern part of the United States. The last important discovery of helium-bearing natural gas was in 1943. Helium also occurs in the earth's atmosphere in about 1 part in 200,000 and in small quantity in gases from some mineral springs, volcanoes, and fumeroles.

Government Helium Reserves.—The Government's most important helium reserve is the Cliffside field, which supplies helium-bearing gas to the Amarillo (Tex.) plant. This field contains an estimated recoverable reserve of 2 billion cubic feet of helium. The Government also owns two relatively small helium-bearing natural-gas deposits—Helium Reserve No. 1, Woodside Structure, Utah; and Helium Reserve

No. 2, Harley Dome, Utah—both on lands of the public domain. They have not been used to produce helium.

The Rattlesnake field, which supplies helium-bearing gas to the Navajo (Shiprock), N. Mex., plant, is controlled by the Government through a long-term lease. The two wells in this field have been shut in since July 1955, when helium-bearing gas became available to the plant from a privately owned source. Both wells in the Rattlesnake field had begun to produce water with the gas before being shut in. A study of the field, still in progress at the end of the year, was aimed at bringing the two wells into production.

Other Sources of Helium-Bearing Natural Gas.—Most of the Nation's helium-bearing gas resources are owned by private companies that produce the gas and transport it to fuel markets without removing the helium. Helium adds nothing to the fuel value, and it is wasted to the atmosphere as the gas is burned. Only at plants at Exell (Tex.) and Otis (Kans.) does the Bureau of Mines extract helium from natural gas produced by private companies for sale to fuel markets; the combined output from these two plants amounts to only about one-tenth of the helium wasted to the atmosphere in other areas.

CONSERVATION

Heavy demands for helium prevented its production for conservation in 1956. Excess helium, which could be conserved by injection into the Cliffside field, was not produced. The converse was true, and 24,865,000 cubic feet of conservation helium was withdrawn, leaving only 46,360,000 cubic feet in storage at year end. It was impossible to shut down the Amarillo plant to conserve Government helium-bearing gas reserves there. The only conservation measure was at the Navajo plant. Helium-bearing natural gas, supplied commercially from the Hogback field, enabled the Government to shut in the Rattlesnake field throughout the year and thereby conserve helium, which otherwise would have been produced from that reserve.

As pointed out, the natural-gas resources that contain helium were being depleted as gas was marketed for fuel. Only limited amounts of helium-bearing fuel gas were being processed to remove the helium. Government owned or controlled reserves were inadequate. Increasing demands and new and potential uses called for conservation measures to assure a future supply of this element for both Government and industrial consumption. Consequently, conservation will be an increasingly important item in future helium programs.

FOREIGN TRADE

Relatively small quantities of helium are exported annually after application to the Secretary of State and subsequent issuance of a license authorizing such exportation.

TECHNOLOGY

The Bureau of Mines technical staff at Amarillo has demonstrated recently that modifying the standard helium-production unit by adding automatic control systems and revised separation equipment can improve production capacity and helium-recovery efficiency materially; at the same time, horsepower requirements are reduced. These changes have been designed into the new units at Exell, and the existing units will be modified as soon as possible.

The search for new sources of helium was continued by obtaining and analyzing samples of gas from new natural-gas fields. Research continued on phase relationships and thermodynamic properties of selected helium-bearing gases. Of particular importance were compressibility tests on gas supplied to the Navajo plant from the Hogback field.

Throughout the year the technical staff assisted in procuring major items of equipment for the Exell-plant expansion while planning and developing specifications for the new production facilities in addition to the more routine research and technical work.

PART III. APPENDIX

Tables of Measurement

Volumetric measures

	U. S. gallons	Imperial gallons	Cubic feet	Barrels	Cubic centimeters	Liters	Cubic meter
1 U. S. gallon [1]	1	0.83268	0.13368	0.02381	3,785.4	3.7853	0.0037854
1 imperial gallon [2]	1.201	1	.16054	.028594	4,546.04	4.5460	.004546
1 cubic foot	7.4805	6.22888	1	.17811	28,317.01	28.316	.028317
1 barrel [3]	42	34.972	5.6146	1	158,987.55	158.98	.15899
1 cubic centimeter	.00026417	.00021996	.000035314	.0000062895	1	.00099997	.000001
1 liter	.26418	.219976	.035316	.0062899	1,000.027	1	.001000027
1 cubic meter	264.17	219.97	35.314	6.2898	1,000,000	999.97	1

[1] U. S. gallon=the volume occupied by 231 cubic inches.

[2] 1 imperial gallon=the volume occupied by 10 pounds of water at 62° F. when weighed against brass in air at 30″ barometric pressure.

[3] 1 barrel=42 U. S. gallons.

Weight measures

	Pounds	Kilograms	Short or net tons	Metric tons	Long ton
1 pound	1	0.45359	0.0005	0.00045359	0.00044643
1 short or net hundredweight	100.0	45.359	.05	.04536	.04464
1 gross or long hundredweight	112.0	50.802	.056	.05080	.05
1 kilogram	2.2046	1	.0011023	.001	.0009842
1 short or net ton	2,000	907.185	1	.90718	.89286
1 metric ton	2,204.6	1,000	1.1023	1	.98421
1 long ton	2,240	1,016.06	1.12	1.01606	1

NOTE.—1 English water ton=the volume occupied by 1 long ton of water at 60° F.

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