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MINERALS IN THE WORLD ECONOMY



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UNITED STATES DEPARTMENT OF THE INTERIOR • Bruce Babbitt, Secretary

BUREAU OF MINES

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

Preface

This edition of the Minerals Yearbook discusses the performance of the worldwide minerals and materials industry during 1992 and provides background information to assist in interpreting that performance. Content of the individual Yearbook volumes follows:

Volume I, Metals and Minerals, contains chapters on virtually all metallic and industrial mineral commodities important to the U.S. economy. Chapters on advanced materials, nonrenewable organic materials, and nonferrous metals recycling also were added to the Minerals Yearbook series beginning with the 1989, 1990, and 1991 volumes, respectively. A new chapter on materials recycling has been initiated in this 1992 volume. In addition, a chapter on survey methods used in data collection with a statistical summary of nonfuel minerals and a chapter on trends in mining and quarrying in the metals and industrial mineral industries are included.

Volume II, Area Reports: Domestic, contains chapters on the minerals industry of each of the 50 States, Puerto Rico, Northern Marianas, Island Possessions, and Trust Territory. This volume also has a chapter on survey methods used in data collection, including a statistical summary of domestic nonfuel minerals.

Volume III, Minerals Yearbook—International Review contains the latest available mineral data on more than 175 foreign countries and discusses the importance of minerals to the economies of these nations. Since the 1989 International Review, this volume has been presented as six reports: Mineral Industries of the Middle East, Mineral Industries of Africa, Mineral Industries of Asia and the Pacific, Mineral Industries of Latin America and Canada, Mineral Industries of Europe and Central Eurasia, and Minerals in the World Economy. The reports incorporate location maps, industry structure tables, and an outlook section previously incorporated in our Mineral Perspectives Series quinquennial regional books, which are being discontinued.

The U.S. Bureau of Mines continually strives to improve the value of its publications to users. Therefore, constructive comments and suggestions by readers of the Yearbook will be welcomed.

Acknowledgments

The U.S. Bureau of Mines, in preparing these Volume III Minerals Yearbook Reports—International Review, extensively utilized statistics and data on mineral production, consumption, and trade provided by various foreign government minerals and statistical agencies through various official publications. The cooperation and assistance of these organizations is gratefully acknowledged. Statistical and informational material was also obtained from reports of the U.S. Department of State, from United Nations publications, and from the domestic and foreign technical and trade press. Of particular assistance were the routine and special reports submitted by the 10 Regional Resource Officers assigned to minerals and petroleum reporting and by economic and commercial officers and other officials of the Department of State located in U.S. Embassies worldwide. Their contributions are sincerely appreciated.

The text and production, structure of the mineral industry, and reserve tables of this volume were prepared by the respective country authors on the staff of the Division of International Minerals, Information and Analysis Directorate. The mineral export and import trade tables were prepared by the International Data Section of the Division of Statistics and Information Services, Information and Analysis Directorate.

The regimes of some countries reviewed in this volume may not be recognized by the U.S. Government. The information contained herein is technical and statistical in nature and is not to be construed as conflicting with or being contradictory of U.S. foreign policy.

George J. Coakley
Chief, Division of International Minerals

This issue of the Minerals in the World Economy is dedicated to the memory of Mr. Charles L. Kimbell (1933-93).

Mr. Kimbell, the Senior Foreign Mineral Specialist at the U.S. Bureau of Mines, was the principal author of the Minerals in the World Economy from 1969 until his death in September 1993. He had 33 years of experience in the field of international minerals, all with the U.S. Bureau of Mines. His career with the USBM began in Denver where he was a student at the Colorado School of Mines. He completed his studies in Geology from American University as a full-time employee of the USBM in Washington, DC. His distinguished career was dedicated to the understanding and standardization of the world mineral production. Among his many contributions to the international mineral statistics was his lead role in the development of standard application of mineral definitions through his association with prestigious world organizations such as the United Nations, the Organization of American States, and the International Consulting Group for Non-ferrous Metals. His capacity for analysis of world events and their significance to the world of minerals earned him the respect and admiration of his colleagues and the recognition as one of the most knowledgeable world mineral specialists.

Contents

Summary of International Events	
Impacting the Mineral Economy in 1992	1
Value of World Crude Mineral	
Production	3
Production Index Patterns	4
Quantitative Commodity Output	5
Value and Trends in World Mineral	
Trade	6
Consumption	6
Nonfuel Mineral Commodities	6
Mineral Fuel Commodities	7
Investment	7
Transportation	8
Marine Transport	8
Panama and Suez Canals	8
Prices	8
Statistical Summary of World	
Production and Trade of Major Mineral Commodities for 1992	8
Availability of Data	9
Acknowledgments and Sources	9

Tables

Table 1.—Estimated Value of World Crude Mineral Production	10
Table 2.—Index Numbers of World Mineral Industry Extractive Production	11
Table 3.—Index Numbers of Mineral-Related Industry Production	12
Table 4.—World Production of Major Mineral Commodities	12
Table 5.—World Primary Energy Production	16
Table 6.—World Electric Power Production, by Generating Plant Type	16
Table 7.—World Electric Powerplant Capacity, by Generating Plant Type	17
Table 8.—Value of World Mineral Commodity Export Trade and Its Role in World Trade	17
Table 9.—Value of Export Trade in Major Mineral Commodity Groups	18
Table 10.—Distribution of Value of World Export Trade in Major Mineral Commodity Groups	18

Table 11.—Growth of Value of World Export Trade in Major Mineral Commodity Groups	18
Table 12.—World Consumption of Selected Mineral Commodities	19
Table 13.—Annual Investment in the Steel Industry for Selected Countries	20
Table 14.—Marketable Economy Country Petroleum Industry Capital Spending, by Geographic Area	21
Table 15.—Salient Statistics on U.S. Foreign Investment in Mineral Industry Activities	22
Table 16.—World Merchant Fleet Distribution, by Type	23
Table 17.—World Bulk Carrier Fleet, by Deadweight Tonnage of Country of Registry as of December 31, 1992	24
Table 18.—World Freighter Fleet, by Deadweight Tonnage of Country of Registry as of December 31, 1992	24
Table 19.—World Tanker Fleet, by Deadweight Tonnage of Country of Registry as of December 31, 1992	24
Table 20.—Panama Canal: Transits and Commodity Movements	25
Table 21.—Movement of Mineral Commodities Through the Panama Canal	25
Table 22.—Nonferrous Metal Prices in the United States	26
Table 23.—Nonferrous Metal Prices on the London Metal Exchange	27
Table 24.—Leading World Producers of Bauxite	27
Table 25.—Leading World Producers of Aluminum	28
Table 26.—Leading World Producers of Chromite	28
Table 27.—Leading World Producers of Mine Copper	29
Table 28.—Leading World Producers of Mine Gold	30
Table 29.—Leading World Producers of Iron Ore, Iron Ore Concentrates, and Iron Ore Agglomerates	31
Table 30.—Leading World Producers of Crude Steel	32
Table 31.—Leading World Producers of Mine Lead	33

Table 32.—Leading World Producers of Manganese Ore	33
Table 33.—Leading World Producers of Mine Nickel	34
Table 34.—Leading World Producers of Mine Silver	34
Table 35.—Leading World Producers of Mine Tin	35
Table 36.—Leading World Producers of Mine Uranium	35
Table 37.—Leading World Producers of Mine Zinc	36
Table 38.—Leading World Producers of Hydraulic Cement	37
Table 39.—Leading World Producers of Natural Diamond	38
Table 40.—Leading World Producers of Nitrogen in Ammonia	39
Table 41.—Leading World Producers of Phosphate Rock	40
Table 42.—Leading World Producers of Marketable Potash	40
Table 43.—Leading World Producers of Salt	41
Table 44.—Leading World Producers of Elemental Sulfur	42
Table 45.—Leading World Producers of Coal (All Grades)	44
Table 46.—Leading World Producers of Marketed Natural Gas	47
Table 47.—Leading World Producers of Natural Gas Plant Liquids	48
Table 48.—Leading World Producers of Crude Oil	48
Table 49.—Leading World Producers of Refined Oil	49

Figures

Figure 1.—Estimated Value of World Crude Mineral Production	50
Figure 2.—Value of Export Trade in Major Mineral Commodity Groups	51

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MINERALS IN THE WORLD ECONOMY

By Ivette E. Torres

SUMMARY OF INTERNATIONAL EVENTS IMPACTING THE MINERALS ECONOMY IN 1992

Many significant events that began in 1990-91 continued to have a profound impact in the world minerals economy in 1992. The dissolution of the U.S.S.R. and the formal breakup of the Council for Mutual Economic Assistance (CMEA) had significant effects far beyond the geographic boundaries of Europe and Central Eurasia. CMEA's network of economic interdependence had relied on central planning, a variety of subsidies, and barter agreements that allowed its members to function without the pressures of productivity and efficiency. In the mineral sector, many decisions had been made based on the need for military planning and technology competition with the market economy world. Because of inexpensive oil available through subsidies and technology assistance from the former U.S.S.R., industries in CMEA member countries had been able to function and maintain production to supply minerals and materials required to support the policies of the central plan. In 1992, most of the former CMEA countries decreased their output of many minerals. In some cases, the network of production that had been in place was severed. Political and economic instability, destruction of infrastructure, and new priorities were affecting other mineral industries in the area.

In late 1991, 15 independent countries replaced the U.S.S.R. and in early 1992 the former CMEA countries found themselves trying to adjust to the realities

of economic independence and the need to compete with former allies for survival. Although 11 of the 15 former Soviet republics joined in the Commonwealth of Independent States (CIS) in December 1991, in 1992, individual economic needs exceeded the needs of the Commonwealth in importance. As a result, new mineral trade patterns emerged as minerals were used as a source of much needed capital.

Initially, foreign entities demonstrated significant interest in investing in and providing assistance to the area, but the interest was later inhibited by civil wars in Armenia, Azerbaijan, Georgia, and Moldova, and by other signs of instability in the area. The effects of these events on the economies and political entities in transition will continue to impact the rest of the world. The most immediate impact to the mineral industry was evident by a significant decrease in mineral production in the former U.S.S.R. observed in 1992. In addition, the ability of many operations to compete by Western standards was questionable. Under these conditions and the limited capital available for upgrading the mineral producing and processing industry, many expected a reduction of the number of mineral-related operations in the future.

As an example of the far-reaching consequences of these events, Cuba, the only full member of CMEA in the Western Hemisphere, was seriously impacted by the CMEA's breakup and by the events that preceded the dissolution of the U.S.S.R. as economic, technical, and other ties were weakened. As a result, after efforts of reducing energy consumption and implementing many

other restrictions to maintain the country's economic model intact, Cuba was forced to open its economy to foreign countries by permitting joint-venture projects in such areas as petroleum and metal refining, for a much needed influx of capital. Mineral output declined because of the energy shortage and lack of basic components required for mineral production. Although trade patterns were changing dramatically and China had become Cuba's main trading partner, CIS countries continued to supply some of the most essential commodities to Cuba but at a much reduced level. Nickel, one of Cuba's most important commodities, is a prime example of the changes generated by this transition. More than 80% of Cuban nickel export in 1989 was destined for the former U.S.S.R. and CMEA countries; in 1991 (the last year for which information was available), only about 30% went to CIS countries.

In 1992, other events in Europe and Central Eurasia affected the production and trade of minerals. Yugoslavia, as a country, ceased to exist. From this breakup, five countries emerged, each with distinct economic and political problems. These problems affected the economy differently in each of the emerging countries. However, mineral production in all five countries decreased significantly. Notable exceptions were increases in output of crude oil, lignite, natural gas, salt, and ornamental stone in Serbia and Montenegro, and an increase of cement output from Croatia. The United Nations imposed economic sanctions against Serbia and Montenegro for its support of ethnic Serbian forces in the Bosnia and Herzegovina conflict.

The status of the mineral industry in Bosnia and Herzegovina, formerly a major producer of minerals and heavy industrial products within Yugoslavia, was uncertain. Estimates for 1992 indicate severe production cuts in all minerals produced. Although Croatia's internal strife ceased in mid-1992, its mineral industry was severely affected by the conflicts. The country's aluminum, oil, and steel sectors were damaged, and there was a short supply of raw materials previously obtained from other republics that had previously been part of Yugoslavia.

Czechoslovakia, another former CMEA member, also continued its transition during 1992. During most of the year, the Federal Government dealt with the inevitable separation of a nation into two different countries, the Czech Republic and the Slovakia. An agreement reached between the two sides called for separation on January 1, 1993. During 1992, mineral production declined although at a lower rate than those of the 2 prior years. One of the most significant changes within this former CMEA entity was the change in its trade patterns observed in 1992. There were marked increases of trade with market economy countries and equally meaningful reductions of trade with the CIS and other former CMEA countries. However, fuel dependency from the former U.S.S.R. continued to be strong.

The trend toward the formation and consolidation of trade blocs that continued throughout 1992 was an issue of concern to most of the world. In the Western Hemisphere, the United States, Canada, and Mexico continued to negotiate the terms for the North American Free Trade Agreement (NAFTA) (ratified by the U.S. Congress in 1993). Although mineral trade between the United States and Canada and between the United States and Mexico has been significant and healthy, many expected the mineral trade among the three countries to improve. Other changes were evident during trade negotiations. In leading to the agreement, Mexico's changes of its trade, foreign investment, mining laws, and privatization efforts generated much

interest from U.S. and international mining companies.

At yearend 1992, the European Community (EC), a highly significant entity in terms of consumption of world raw materials, inaugurated the free movement of goods and services among its member countries. In expectation of this event, member countries sought to improve efficiency and productivity in order to improve their industrial competitiveness within the community. In addition, companies from countries outside the EC, in particular the United States and Japan, were seeking to increase their participation in companies within the Community. The strength of the EC alliance also impacted others outside of its membership by defining requirements and standards of products traded into the Community, impacting industries producing mineral commodities. This, in fact, determined the viability and recoverability of many economies and industries in transition in Europe and Eurasia.

In Latin America, in addition to the proposed NAFTA, other countries were members of a variety of existing trade groups. These different groups were also working together to eliminate tariff barriers among their member countries. Other groups were negotiating agreements that would unite many of the Latin American countries in the near future. Groups such as the Central American Common Market, the Latin America Free Trade Area, the Caribbean Community, the Andean Pact countries, and the Southern Cone Common Market were some of the groups that were negotiating or had negotiated trade agreements in the area. In addition, Chile and Mexico had signed a bilateral trade agreement that became effective in 1992. Mexico was also negotiating a trilateral trade agreement with Colombia and Venezuela. This agreement was expected to be signed in 1994.

As a region, Latin America and Canada's major export market for mineral-related commodities was the United States. During 1988-91, Canada was the leading U.S. supplier of asbestos, cadmium, cement, gypsum, iron ore,

lead, mica, nickel, nitrogen, peat, potash, selenium, sodium sulfate, sulfur, and zinc. During the same period, Mexico was the leading source of U.S. imports of fluorspar, graphite, and strontium. Brazil was the leading U.S. supplier of columbium, silicon, and tin. In 1992, Latin America and Canada supplied almost 44% (by volume) of the U.S. imports of crude oil and almost 47% (by volume) of U.S. imports of petroleum products. In general terms, Canada was the most important U.S. trading partner and Mexico was the third.

Latin America and Canada produced more than 40% of the world silver, more than 35% of the world output of copper and zinc, and more than 30% of the world production of nickel and tin. If U.S. mineral production is included, the Western Hemisphere becomes an even more important world mineral producer. The Western Hemisphere in 1992 produced more than 50% of the world copper and silver; more than 40% of the world aluminum, sulfur, and zinc; and about 35% of the world lead, petroleum products, phosphate rock, and salt.

Changes in economic policies that began in the 1980's in Latin America continued in 1992. Many countries in the area were moving toward economic stability after a period of dramatic changes in mining and investment policies that were giving confidence to and increasing interest in the international investment community, including the mining sector. Privatization programs touched many aspects of the mineral and processing industries. Liberalization trends like these impacted the mineral sector and resulted in economic growth in the area when other regions in the world were suffering from economic stagnation.

In Asia and the Pacific, three countries continued to be among the top countries in the world of minerals in 1992. Australia and China, with diverse nonfuel minerals resources and production bases, together or individually produced more than three-fourths of the area's output of alumina, bauxite, bituminous coal, fluorspar, iron ore (gross weight), mined lead, mercury, rutile, tungsten, and mined zinc. Japan, the other country in

the area among the top 10 in world mineral significance (although with limited resources), was the top producer of refined copper, pig iron, crude steel, refined nickel, and refined zinc in Asia and the Pacific. It was the world's second leading producer of cement (after China) and the third leading producer of refined lead in Asia and the Pacific. Japan's importance was not based only on its production level of refined metals, but its position was enhanced by being the leading consumer of many raw materials and fuel minerals to sustain its advanced economy.

Many countries within the Asia and the Pacific region were working on developing closer trade and economic ties. In the area, Japan had the largest trade surplus with the United States, followed in decreasing order by China, Indonesia, Taiwan, Australia, and New Zealand.

The Africa and the Middle East area was very important in terms of certain strategic minerals. In 1992, it produced almost 50% of the world's chromite and more than 60% of the world's mine cobalt output. The two leading producers in the area were Zambia (32%) and Zaire (26%). Africa and the Middle East also furnished about 40% of the crude oil produced in the world, almost three-fourths of which came from the Middle East. Africa was the source of about 40% of the world's diamond and more than 30% of the gold produced during the year.

The most important mineral producing country in Africa and the Middle East was the Republic of South Africa, the only producer in the area to rank among the top 10 countries in mineral importance. In 1992, the Republic of South Africa produced about 60% of the chromite produced in Africa and the Middle East (about 75% of that produced in Africa). It was the world's leading producer of gold, accounting for more than 30% of the world's total and more than 85% of the gold produced in Africa and the Middle East. The Republic of South Africa was also the leading producer of iron ore and manganese ore and the second leading producer of crude

steel and uranium in Africa and the Middle East. Output of platinum-group metals from the Republic of South Africa was more than 50% of the world's total. The Republic of South Africa was the leading world producer of platinum (more than 70% of the total) and the second leading producer of palladium.

Turkey was the leading producer of cement and steel in Africa and the Middle East. It also was the second leading world producer of boron minerals with about 40% of the world total in 1992. An associated member of the EC, Turkey was a founding member of the Black Sea Economic Cooperation Zone in 1991. Other member countries were Albania, Armenia, Azerbaijan, Bulgaria, Georgia, Greece, Moldova, Romania, Russia, and Ukraine. The group met during 1992 to discuss closer economic ties among the members and to set up the Black Sea Economic Business Council. The Government of Turkey has proposed a free trade area in the zone. Several investment, economic, and technical assistance agreements between Turkey and other member countries were signed during the year, some related to mineral commodities such as gold and oil.

In 1990, Iraq became the focus of world attention as it invaded Kuwait. The effect of the war that followed continued to be felt during 1992. Disruption of oil supplies was caused by the destruction of infrastructure and mineral fuel facilities. This was partially offset by the resumption of production from Kuwait, which accounted for about 60% of the 1992 output increase in the Middle East. Although it appeared that Iraq had restored a significant portion of both its mineral fuel and nonfuel mineral capacities, the trade embargo imposed on Iraq by the United Nations remained in place, forcing the country to limit sales largely to an internal market. Only food and medicine were excluded from the embargo. Total world output of crude oil was not significantly affected by the war between Iraq and Kuwait as other countries increased their output and the net decrease in 1991 was only 1%. In 1992, world output increased by about the same percentage.

VALUE OF WORLD CRUDE MINERAL PRODUCTION

The estimated value of world crude mineral production in 1992 was \$1,633.3 billion in terms of current (1992) dollars, or \$1,178.0 billion in terms of constant 1983 dollars. This latter figure was 4.8% above the 1992 level but was 2.4% below the record-high level of \$1,207.1 billion 1983 dollars set in 1980. Table 1 provides the latest available revised time series of the estimated value of world crude mineral production both in terms of 1983 constant dollars and in terms of current dollars. The statistical base for this estimation is derived from the data on the value of production of a group of key commodities that was published in the authoritative French language mineral industry periodical, *Annales des Mines*, for selected years up to 1983.

The aforementioned values and those presented in the table are for crude minerals only and only begin to suggest the impact that the mineral industry has on the world economy. These figures represent only the value of mineral materials as they are mined or otherwise extracted from the Earth. They do not reflect the value added to these materials through downstream processing within the facilities commonly accepted as mineral industry plants. That is, value added through beneficiation of ores, smelting, refining, and similar processing is not included in these figures. Comprehensive world data on the value added by such processing are not available; however, a conservative estimate of the total value of processed output from mineral industry plants derived wholly from primary (newly mined) materials would be on the order of about \$2,800 billion constant 1983 dollars or \$3,900 billion in terms of 1992 dollars.

To evaluate fully the worth of the total output of mineral industry plants would require the addition of a substantial (as yet unestimated) increment for the output derived from secondary raw materials, such as scrap and other reclaimed substances. Such recovery for some mineral materials is virtually nonexistent

or inconsequential, but for others it is very significant. For example, in 1992, about 30% of world steel production, 46% of world refined lead output, and 15% of world refined copper production were clearly identified as being derived from scrap. Similarly, about 30% of aluminum output in the Western World was from scrap.

The overall impact of the mineral industry extends far beyond the worth of all its products as measured by their sale value, whether the product be of primary or secondary origin. Mineral products constitute the overwhelmingly dominant share of the total raw material supply for all manufacturing operations. This encompasses not only the traditional "smokestack" industry facilities that use steel and other metals in the production of industrial equipment and consumer durables and the construction industry that converts mineral products into a host of structural types, but also such industries as textile mills whose raw materials are, increasingly, synthetic fabrics. Also, many high-technology and advanced materials depend entirely on mineral-based materials from silicon chips and optical fibers to graphite composites and barium-lanthanide-base superconducting ceramics. In the areas of agricultural and forestry industries, mineral fertilizers and other mineral-based soil treatment products are indispensable for maintaining high production and productivity. Mineral products are essential to the transportation industry as raw materials for roads, railroads, bridges, runways, and docking facilities as well as for conveyances that use them; in addition, the mineral industry is a major user of transportation networks. The mineral industry itself provides all but a small share of the total energy required for the mining and processing of other mineral commodities and of agricultural materials from crude forms to the manufactures derived therefrom, and it also provides the overwhelmingly dominant share of the energy required to transport all raw materials, products, and people. Finally, all electrical energy—that derived from hydroelectric and geothermal sites as well

as from nuclear and conventional thermal powerplants—could not be produced and distributed without equipment and transmission lines fabricated from mineral commodities.

Production Index Patterns

Table 2 summarizes the development pattern of the world's extractive mineral industry output over recent years, as reflected by the extractive industry components of the United Nations (UN) industrial production indexes that appear quarterly in the UN Monthly Bulletin of Statistics. The table indicates an increase in overall extractive productive operations in 1984, followed by a decrease in 1985, an upturn during 1986-89, a stable performance in 1990, a notable decrease in 1991, and a recovery in 1992. Quarterly results show a notable decrease for the second quarter of 1991, with a significant recovery during the second half of the year.

Although the metal extractive index increased steadily in 1991, the decrease of the oil and gas and coal sectors in the second quarter of the year lowered the extractive industry aggregate. The recovery in the second half of the year mirrored the recovery of the oil and gas sector. Total extractive industry quarterly data for 1992 show a slight increase for the first quarter of the year, a decrease for the second quarter, followed by increases in the third and last quarters of the year. Although the metal extractive index decreased significantly from the last quarter of 1991, the decrease of the second quarter again mirrored that of the oil and gas index. In the third quarter, only the coal index decreased. All indices increased during the fourth quarter of the year.

In the case of the processing industries, both nonmetallic mineral (industrial mineral) products and base metals registered declines between 1990 and 1991, with only chemicals, petroleum, coal, and rubber products logging growth. Between 1991 and 1992, indices for nonmetallic mineral (industrial mineral) products and chemicals, petroleum, coal, and rubber products

showed a decrease while that of the base metals declined very slightly. Quarterly data show that nonmetallic mineral (industrial mineral) products advanced rather sharply between the first quarter of 1991 and then suffered drops through the third and fourth quarters. The drop continued for the first quarter of 1992, with a sharp increase in the second quarter and a decrease in the third quarter and a slight increase during the last quarter of 1992. Chemicals, petroleum, coal, and rubber products showed a significant increase between the first and second quarters in 1991, a decline in the third quarter, and an increase in the fourth quarter. In 1992, the first quarter showed a decrease, followed by a large increase in the second quarter, a decrease in the third quarter, and another large increase in the last quarter of the year. Different yet was the pattern for base metals, which logged increases in the first two quarters of 1991, a decrease during the third quarter, followed by an increase in the last quarter. In 1992, the index increased during the first two quarters and decreased during the last two quarters, being the only index of mineral processing to finish the year with a decrease.

The UN Monthly Bulletin of Statistics also reports individual industrial production indices for a limited number of countries. Of the approximately 50 countries reported, 46 report an index for mining output. Of the seven countries available in the Western Hemisphere, the United States, Canada, Chile, and Mexico registered increases in the mining index for 1992. Brazil, a major mining producer remained at the same level as that of 1991. Information for Argentina, one of the countries listed, was not available. In Europe and Central Eurasia, indices for the former U.S.S.R., Czechoslovakia, and Yugoslavia were not available individually or as the new formed countries. Of the 15 European countries reporting indices, only Denmark, Finland, Italy, Norway, Sweden, and Portugal showed increases. Few 1992 mining indices were available for Africa and the Middle East. Of those, Cyprus and Zambia showed gains

while Turkey and Zimbabwe showed decreases. The index for the Republic of South Africa, the most important producer of the region, was not available. For the Asia and the Pacific region, only four countries' indices were available for 1992. Mining indices for Japan and the Republic of Korea decreased while those for Fiji and Malaysia increased. The index for Australia, one of the major producers in the region, was not available.

Quantitative Commodity Output

Table 4 presents world mineral production of 101 distinct mineral commodities and/or subdivisions of mineral commodities for 1988-92. Of those, only 29 registered increases in 1992 relative to their 1991 output levels and 72 showed declines. These results were slightly better than those for 1991, when only 24 commodities logged increases, 76 recorded declines, and 1 remained unchanged from the 1990 levels on the basis of revised data available to the U.S. Bureau of Mines. These results are greatly affected by the performance of many of the countries in Europe and Central Eurasia, in particular the former U.S.S.R. republics and CMEA members.

Of the 53 metallic mineral commodities recorded separately in table 4, only 17 recorded production gains in 1992 and 36 showed declines. Of the 17 showing gains, only 3 (mine and refined copper, and gold) reached new record production highs in 1992. Other commodities logging output gains in 1992 with respect to 1991 levels, but not achieving record output levels in 1992, together with the year in which they reached historic output highs, were arsenic trioxide (1968), beryl concentrate (1961), smelter bismuth (1985), primary smelted copper (1989), secondary refined copper (1989), primary smelted lead (1988), secondary magnesium (1981), monazite concentrate (1985), refinery selenium (1990), refinery tellurium (1985), ilmenite (1989), titanium slag (1990), uranium (1980), and zirconium concentrate (1989).

Of these, mine copper and primary refined copper recorded gains for the 10th consecutive year and mine gold for the 12th consecutive year. Uranium production increased after declining for 3 consecutive years. However, most metals that increased in output were recovering from 1 or 2 soft years after strong years in 1988, 1989, and/or 1990.

Of the 36 metallic commodities showing lower 1992 output levels than in 1991, the following decreased for at least 3 consecutive years: antimony, mine bismuth, secondary smelted copper, mine cobalt, iron ore, pig iron, ferroalloys, crude steel, secondary smelted lead, primary refined lead, manganese ore, mercury, molybdenum, mine nickel, mine tin, secondary smelted tin, mine vanadium, and secondary zinc metal.

Of the 37 individual categories of nonmetallic minerals and their products listed in table 4 under the heading "industrial minerals," only 6 registered gains in 1992 compared with their 1991 output levels. Of those recording gains, cement, feldspar, soda ash, and strontium materials attained new production high levels in 1992. Other commodities in this group that logged output gains between 1991 and 1992, but with a 1992 output that fell short of their previous record highs, together with the year in which they reached record-to-date output, were gem and industrial diamond (both in 1990).

Of the six nonmetals registering gains, feldspar registered an increase for the 17th consecutive year. Cement increased for the second consecutive year. Gem diamond, industrial diamond, soda ash, and strontium logged an output gain after reductions in 1991.

Of the 31 other commodities in the group of "industrial minerals" or nonmetals commodities that logged output declines between 1991 and 1992, the following registered decreases for at least 3 consecutive years: asbestos, bentonite, corundum, diatomite, fluorspar, graphite, gypsum, lime, mica, ammonia, phosphate rock, potash, industrial sand and gravel, sodium sulfate, elemental sulfur, sulfur from pyrites, and vermiculite. Of the 11 mineral fuel commodities listed in table

4, 6 registered output gains between 1991 and 1992. Considering first the production of primary energy commodities, bituminous coal increased after 2 years of decreased output. Marketed natural gas output (gross production less that was flared, vented, and reinjected into reservoirs for pressure maintenance) increased for the 10th consecutive year, reaching a new historic high. Other major primary mineral sources of commercial energy, however, logged declines in 1992. Lignitic coal output fell for a third consecutive year, after continuously recording growth for 22 years ending in 1989. The single most dominant primary energy source, crude oil, increased for the sixth consecutive year.

Natural gas liquids, chiefly butane, propane, and natural gasoline, derived as a byproduct of natural gas, increased for the third consecutive year.

Peat is listed among mineral fuels because of its origin and nature, both similar to those of low-rank coals. However, about 80% of total peat output is used as a soil conditioner and for other nonfuel purposes. Output in 1992 declined for the third consecutive year.

As for the four mineral fuel products listed in the table, refined oil decreased for the second consecutive time since 1984-85. The record-high refined oil output was that of 1979. Carbon black output increased slightly after it decreased in 1991. Output of metallurgical coke increased after 2 years of decline while other coke decreased for the third consecutive time in 1992.

The overall performance of the nonfuel mineral industry can only be summarized in terms of the value of production, and for these nonfuel commodities, exactitudes on the relative role of each commodity in the aggregate are not available for any year subsequent to 1983 (see section on value of world mineral production). Among fuel commodities, however, the overall pattern of output level changes and their interrelationships can be demonstrated not only on the basis of value, but also by reporting each fuel in terms of a common unit measuring its energy content. This has been done in

this chapter on the basis of standard coal equivalents (SCE), as reported by the United Nations. Table 5 summarizes world output of energy commodities for 1981-91 as reported by the United Nations, with estimates for 1992 by the U.S. Bureau of Mines.

Available information suggests a slight increase in primary energy production to an estimated 10,640 million metric tons of SCE. Of the individual commodity group components, solid fuels output apparently declined about 3%. Output of natural remained stable. Production of liquid fuels (including natural gas liquids) increased 3.2%. Generation of electric power by hydroelectric and geothermal plants collectively increased, but only marginally. Nuclear power generation grew by an estimated 1.5%.

Although no update of UN statistical information included in tables 6 and 7 of the 1991 edition of this chapter relating to power generation and powerplant capacities was available in time to be incorporated in this edition, estimates updating these data have been made based on other published data of the UN and the U.S. Department of Energy. Table 6 presents statistics on electric power generation subdivided by the type of plant for 1982 and 1988-92, and table 7 provides comparable statistics on capacity by plant type for the same years.

In the 11 years 1982-92, output by world nuclear powerplants increased an estimated 143%. In 1992, electricity generated by nuclear plants was 17.3% of all power generated and 48.1% of all primary electricity, as shown in table 6. The growth trend in plant capacities was significant. There was a 1.7% apparent increase in global nuclear plant capacity between 1991 and 1992, still larger than the increase of less than 1% for total electric plant capacity.

The indicated 1982-92 growth in geothermal power was an estimated 135%. Although this output was of some significance to a few of the geothermal power-producing countries, it remained inconsequential in terms of total world energy output.

In the case of hydropower, there was an insignificant growth in output in 1992,

but with an estimated 1% growth in hydroplant capacity in 1992.

Global production of thermal power apparently increased by 1.5% in 1992, slightly less than the 1.3% increase in 1991, a 1.9% increase in 1990, and far less significant than the 4.6% increase in 1989.

VALUE AND TRENDS IN WORLD MINERAL TRADE

Table 8 provides data for the estimated value of world export trade of all mineral commodities from 1980 through 1991. It also provides a breakdown of the total into mineral fuels and nonfuel minerals. These data have been developed from UN export trade data presented in table 9. The percent distribution and growth of the value of world export by major commodity groups are presented in tables 9, 10, and 11, respectively. In terms of industrial minerals (nonmetals), data in tables 10 and 11 include crude industrial minerals only, while table 8 includes an estimate for other industrial minerals. The 1991 estimates that appeared in the 1991 issues of this publication have been revised. It is typical for this section to review the year prior to the year of review because of the unavailability of data at the time of publication.

The aggregated value of export trade in mineral commodities for 1992 was not available at the time of publication. The total value of nonfuel and fuel mineral exports for 1991 was about \$616 billion in current (1991) dollars. The value of mineral fuel export trade accounted for about 53% of the total mineral export trade. In 1980, the contribution of mineral fuel to the value of mineral commodity export trade had been almost 68%. The 1991 world mineral commodity export trade represents a 5.3% decrease (table 8) from that of 1990. The largest decrease was attributed to the decrease of export trade of fuel minerals (5%). The value of nonfuel mineral export trade decreased by 4%. Because the value export trade of all commodities increased by 1.2%, the share of mineral commodities decreased from 19.2% to 17.9% of the total.

Although UN data indicate that the value of mineral export decreased in almost all of the geographic areas, the largest decrease was observed in the former U.S.S.R. and Eastern European countries. The smallest decrease from that group of countries was seen in nonferrous metals (24%). Decreases in other mineral areas were from 40% to 60%.

CONSUMPTION¹

Of the 15 selected nonfuel mineral commodities detailed in table 12, only 3 indicated increases in worldwide consumption in 1992. As in 1991, decline in consumption levels of the selected commodities can be attributed to reduced levels of use in the former U.S.S.R. and Eastern Europe. Of the remaining 12 commodities, 2 magnesium and cadmium, stayed relatively the same, while the other 10, including iron and steel, all recorded decreases. Global consumption of iron ore is estimated to have fallen about 3.5% or about 30 million tons. This is a greater decline than what was estimated for production of iron ore, which is down only 2.7% or nearly 26.5 million tons, suggesting an addition to stocks. The consumption trend for iron and steel has been declining since 1989. This has mainly been due to the continued drops in use in the former U.S.S.R. and Eastern Europe. Even as the European economy begins to turn upward, there may only be a slight increase in consumption of iron, steel, and cement, considering the high cost of construction needed to modernize factories and buildings in Eastern Europe. Many feel that the economies of these countries are limited by the current status of their industries.

Nonfuel Mineral Commodities

For the first time since the U.S. Bureau of Mines has been publishing Minerals in the World Economy, a breakdown of statistics for nonferrous metals in table 12 between centrally planned economies and market economies is not given. Previously, the two groups were separated because the consumption

trends from year to year tended to differ. The trends in the market economies were often affected by the economies of those countries, while the trends of the centrally planned economies resulted from strict state planning. Also, many of these formerly centrally planned economy countries are in the process of integrating their economies into the world market. However, not all countries are at the same stage of economic transition, and it is no longer clear which economies are strictly centrally planned and which have achieved market economy status. Therefore, the two divisions will be reported as one under "World Totals."

Of the eight nonferrous commodities listed in table 12, only consumption of aluminum and copper rose 3.7% and 1.5%, respectively. It was the second straight year consumption of aluminum demonstrated an increase. Cadmium and magnesium did not register a significant change from the previous year. The final four commodities all demonstrated waning consumption, mostly continuing trends from at least the 2 previous years. Overall, consumption in Eastern Europe and the former U.S.S.R. was down in 1992 contributing to the worldwide reduction in consumption.

Paralleling the pattern of world consumption, more commodities reported declines in production between 1991 and 1992 than registered increases. Lead was the sole commodity in which the percentage of decline in production levels equaled the same relative percent of decline in consumption. Production levels for aluminum and magnesium decreased while the consumption level either stayed about the same or increased. This would imply a net stock drawdown for those commodities. The same may be said about zinc, for which production and consumption both decreased but the rate of production exceeded that of consumption. The remaining four nonferrous metals showed a greater decline in consumption than production, which suggests an addition to stocks.

For the industrial minerals, cement again registered an increase (5.4%) in consumption, as it has for years, despite continuing negative trends for a number of other mineral commodities. The three

fertilizer commodities and sulfur all demonstrated lower consumption levels than those in 1991. Continuing a 3-year trend, nitrogenous fertilizer registered a decline, while both phosphate and potassic fertilizer are estimated to have a 4- and 3-year reduction, respectively. Global consumption of sulfur also continued to ebb, declining by 2.2 million metric tons.

Mineral Fuel Commodities

Data on mineral fuel consumption in table 12 have been provided in terms of SCE to facilitate interfuel comparisons. The aggregate total is estimated to be 10,440 SCE, an estimated growth increase of less than one-half the small increase of 1991.

Considering the relative share of total energy consumption provided by each of the listed fuels, natural gas continued to account for nearly 25% of total energy consumption. Liquid fuel showed a gain, accounting for 40.2% of the total compared to 39.1% in 1990. Primary electricity, nuclear, geothermal, and hydropower remained steady with a 5.2% share of the total, while solid fuels were the only energy source to register a quantifiable drop.

INVESTMENT

World investment in all mineral and mining industry sectors is not available. However, partial information available provides some information useful for analysis. Information available in this section covers limited geographic information on investment in the steel industry, limited information for petroleum industry capital spending, and total U.S. foreign investment in comparison to the mineral-related sectors (tables 13, 14, and 15). Annual steel industry investment is available for the European Community, almost all countries within the European Free Trade Association (EFTA), Latin America, and other countries with significant mineral industries, such as Canada, Japan, and the United States. Although information was not available for 1992, data for 1991 indicate that for those countries

mentioned, total investment increased by 8%. However, investment patterns were very different within the different groups of countries. While the European Community had a net increase of 12%, dominated by an almost 40% increase in Germany, EFTA member countries had a 26% decrease in investment for the same period. Investment in EC countries was almost seven times that of EFTA countries. Japan's investment in the iron and steel industry, by far the largest of those available, almost twice that of the EC and almost four times that of the United States, increased by more than 20%. In North America, investment in Canada and the United States decreased. Almost all of Latin America decreased investment in the sector. The notable exception was Mexico, with a 60% increase. Changes in Mexico's investment policies of the recent past, its economic growth, and privatization of its iron and steel industry are some of the reasons for such an increase. The other country covered individually in Latin America, where investment in the iron and steel industry increased, although slightly, was Argentina. This limited information does not allow a comprehensive analysis of global industry trend, which in turn impacts many other mineral commodities, and with the transition in many countries within Europe and Central Eurasia that are now effecting the steel industries of the countries that were members of the U.S.S.R. and its CMEA partners, it is most regrettable that comprehensive and comparable data, both current and historic, on investment in this area are not available.

Updated information on petroleum industry capital and exploration expenditures by geographic area indicates a 2% decrease in 1992 from the revised figure from 1991. The \$66.7 billion included gains in capital expenditures in all plant categories and in refinery. Decreased capital expenditure in the United States, Canada, and Western Europe in the crude oil and natural gas sectors were responsible for the decrease.

Salient statistics on U.S. foreign investment in mineral industry activities (table 15) as reported by the U.S.

Department of Commerce have been revised to show the latest information for the years 1988-92. In 1992, total U.S. foreign investment grew by almost 6%. The mining sector, which represented about 3% of the total in both 1991 and 1992, increased by 8%. The largest increase was seen in the metals sector (32%). The growth of U.S. foreign investment in the primary and fabricated metals sector was about the same as that in the coal sector (3%). The smallest growth was the U.S. foreign investment in the nonmetallic minerals (industrial minerals), excluding fuels (0.9%). U.S. foreign investment in the petroleum sector, about 11% of the total, decreased for the first time since 1989.

TRANSPORTATION

Marine Transport

Bulk carriers, freighters, and tankers are the three classes of seagoing vessels engaged in transporting mineral commodities. However, vessels in these classes are not exclusively devoted to mineral commodity transport. Bulk carriers move considerable tonnages of agricultural products as well as crude minerals, their concentrates, mineral fertilizers, and the like. Freighters, owing to their great variety, can be devoted wholly to hauling mineral products or wholly to nonmineral goods, as well as carrying mixed mineral commodities and nonmineral commodities. They include general cargo ships, full container ships, partial container ships, roll-on/roll-off ships, and barge carriers. Tankers, although largely engaged in moving crude oil and refinery products, also transport liquid chemicals, molasses, wine, liquefied natural gas, and other fluids.

Although physical characteristics of vessels such as size, draft, crew requirements, type of propulsion system, ratio of gross tonnage to cargo tonnage, and fuel costs have undeniable influences on shipping industry performance, problems of and changes in the quantity and types of materials moved also significantly affect the shipping sector of the world economy, and thus have a

bearing on the minerals sector of that aggregate. Unfortunately, comprehensive global data reflecting changes in these critical variables are not published.

Tables 16 through 19 present the world merchant fleet distribution by type of vessel and by major country ranking. This is the first year that the former U.S.S.R. does not show as an entity. Information available for 1992 indicates that a significant portion of the former U.S.S.R. bulk carrier, freighter, and tanker fleet capacities were retained by Russia. In comparison with 1990 information, the last year available for the former U.S.S.R., Russia in 1992 had 56% of the total bulk carrier fleet, 60% of the freighter fleet, and 50% of the tanker fleet. No other country that separated from the former U.S.S.R. appeared among the top 30 countries in the world.

Panama and Suez Canals

Tables 20 and 21 provide the latest available information on the transit of mineral commodities through the Panama Canal, by number of vessels, direction, and the commodities transported. The number of vessels transiting the Panama Canal remained about the same, while the total amount of cargo moved through the waterway decreased by 2.2% between fiscal years 1991 and 1992. Movement of mineral commodities decreased by 5.1% and constituted only 43.9% of the total of cargo moved.

Information on commodity and vessel movements through the Suez Canal has not been available to the U.S. Bureau of Mines since 1987.

PRICES

The series summarizing the prices of the major nonferrous metals on the stock exchanges of the United States and the United Kingdom (London Metal Exchange) has been continued this year in tables 22 and 23. Time constraints have prohibited preparation of other price information that has appeared in this study in previous years. Users are urged to consult the 1993 U.S. Bureau of Mines publication *Metal Prices in the United*

States through 1992, which gives an analysis of historical price series and trends, or the 1993 edition of *Mineral Commodity Summaries* for current U.S. prices on nonfuel commodities, and to utilize U.S. Department of Energy sources for information on fuel material costs.

STATISTICAL SUMMARY OF WORLD PRODUCTION AND TRADE OF MAJOR MINERAL COMMODITIES FOR 1992

The final 26 tables of this chapter, tables 24-49, extend and expand the statistical series on production that was started in the 1963 edition of the *Area Reports: International volume of the Minerals Yearbook* and that was subsequently updated and expanded in the 1965 and 1967-90 editions. Mainly because of the separation of the countries that formed the U.S.S.R., the column that provided a 5-year average, was deleted. The listing order of major producers, however, continued to be, as in past years, in descending order of rank in the year of review, 1992.

This group of tables now includes each of the top 19 crude minerals in 1983 in terms of value of their output plus 3 others of lesser rank. These 22 crude mineral commodities accounted for more than 98% of the estimated value of world crude mineral production in 1983. Coal production, included in the 1983 value of production table as two separated entries, is combined in one table in this chapter. World output of five key downstream products—aluminum, steel, cement, nitrogen in ammonia, and refined oil—is included because of their significance as products.

These 26 tables are primarily a supplement to other statistical data within this chapter but also summarize international production data for major mineral commodities covered in greater detail on a commodity basis in the *Mineral Commodity Annual Reports* of 1992 and on a country basis in the regional reports of the *Minerals Yearbook—International Review*. In this 1992 edition, the data presented in these

tables, in most instances, correspond with the data in individual commodity world production tables appearing in U.S. Bureau of Mines Commodity Annual Reports but may differ somewhat from individual country data appearing in the component sections of the International Minerals Yearbook and/or from any total that might be obtained by adding figures presented for any single commodity in each of the country articles of the International Review due to the availability of reported data at the different times of writing.

ACKNOWLEDGMENTS AND SOURCES

For a study such as this, which summarizes and amalgamates much information collected, compiled, and utilized by the numerous U.S. Bureau of Mines country specialists and branch chiefs for inclusion in their country and regional reports that comprise the five other sections of 1992 Minerals Yearbook—International Review, it is clearly impossible to cite all sources of information used in its presentation, but some recognition is due.

Generally speaking, this study and its related detailed studies on countries and areas would be much more difficult, if not impossible to complete, without the efforts of the personnel of our counterpart national mining and geological agencies throughout the world. Information that they collect, compile, and then publish, either in their own volumes or those of central statistical agencies in their countries, are the foundations on which this work rests. Thus, our appreciation is expressed to the multitude of persons employed by these agencies for their contributions.

At this point, it is appropriate to recognize some of the employees of the Department of State, Regional Resource Officers, and others who have ensured that publications and other informational materials from the countries for which they are responsible flow into the U.S. Bureau of Mines.

Next, acknowledgment must be given to Bureau country and commodity

specialists in the Division of International Minerals and the Division of Mineral Commodities, respectively, who regularly process vast volumes of material to glean from it the information aggregated herein. Special recognition must also be given to the personnel of the Section of International Data of the Division of Statistics and Information Services, who have painstakingly compiled foreign trade information and coordinated the assembly of world production data on the various commodities developed by the country specialists in consultation with the Bureau's commodity specialists.

The work of the staffs of the Statistical Office of the UN as well as similar offices in the OECD and the EC is acknowledged. These organizations provide certain statistical aggregates that are beyond the financial and work force capabilities of the U.S. Bureau of Mines.

Particular appreciation is due to the mineral statistics personnel of the International Lead and Zinc Study Group; the International Nickel Study Group; the French-based firm Metaleurop S.A.; the German-based firm Metallgesellschaft AG; the Italian-based firm Nuova Samim; and the World Bureau of Metal Statistics in the United Kingdom.

Similarly, for their cooperative consultations relating to many mineral commodities not only in their own countries but in other world areas as well, special individual acknowledgement must be given to the internationally oriented personnel of the British Geological Survey and Canada's Ministry of Energy, Mines, and Resources Canada.

The cooperative (collegial) sharing of information by the Metal Mining Agency of Japan, the Federal Institute of Geosciences and Natural Resources of Germany, and the Bureau of Geological and Mining Research of France is also gratefully acknowledged.

¹By Theodore Spital, International Data Coordinator, Section of International Data.

TABLE 1
ESTIMATED VALUE OF WORLD CRUDE MINERAL PRODUCTION

Year	Value of 53 ¹ major crude mineral commodities ²		Value of all crude mineral commodities ³	
	Billion current dollars	Billion 1983 constant dollars	Billion current dollars	Billion 1983 constant dollars
1950	29.5	103.5	29.5	117.9
1953	37.0	135.1	42.5	155.3
1958	50.0	173.5	60.1	208.5
1963	59.0	192.0	72.3	235.3
1968	77.9	222.3	94.5	269.8
1973	159.2	357.3	191.6	430.0
1978	477.0	728.5	539.6	824.1
1979	656.5	901.2	733.2	1,006.5
1980	902.9	1,094.6	995.7	1,207.1
1981	912.0	1,008.1	993.2	1,097.9
1982	902.9	938.1	971.2	1,009.1
1983	930.4	930.4	988.7	988.7
1984 ^r	992.7	951.2	1,054.6	1,010.6
1985 ^r	1,015.6	938.1	1,080.3	997.8
1986 ^r	1,074.0	966.5	1,142.2	1,027.9
1987 ^r	1,121.0	977.5	1,193.7	1,040.9
1988 ^r	1,232.5	1,034.4	1,312.2	1,101.3
1989 ^r	1,346.9	1,082.5	1,433.2	1,151.9
1990 ^r	1,405.3	1,082.5	1,495.0	1,151.6
1991 ^r	1,434.4	1,061.8	1,526.1	1,129.7
1992	1,540.4	1,111.0	1,634.8	1,179.1

^rRevised.

¹The list of commodities included has been varied slightly by the authors of the basic source article over the years, and the number 53 may be regarded as debatable. Forty-eight commodities were included in every study, 1950-83 inclusive, and are included in a listing in table 3 of the 1985 edition of this chapter; this list of 52 entries also includes columbium-tantalum (as a single entry), kyanite, uranium (each of which has been included in the study from 1950-83 inclusive), and beryl (which was included in the study from 1950-68 inclusive). Additionally, a generic group (natural abrasives), perlite, and vermiculite were incorporated into the 1950 study but dropped thereafter; lithium was included in 1958 only; and asphaltic limestone was included from 1950-68 inclusive. The alterations in the number of commodities had little, if any, significant effect on the totals, with the possible exception of uranium's omission in 1950 and 1953.

²Data for 1953, 1958, 1963, 1968, 1973, 1978, and 1983 are as reported in *Annales des Mines*, July-Aug.-Sept. 1985, p. 9. Data in constant dollars for 1979-82 and 1984-92 inclusive are extrapolated from the 1983 *Annales des Mines* figures on the basis of the United Nations index of extractive mineral industry production in the United Nations Monthly Bulletin of Statistics, Nov. 1993, p. 242. Data in current dollars for 1979-82 and 1984-92 inclusive are derived from the constant dollar estimates using reciprocals of the most recent available U.S. price deflators.

³Data extrapolated from values for 53 commodities to compensate for other (additional) mineral commodities. For details on the basis for this extrapolation, see accompanying text under "Value of World Mineral Production."

TABLE 2
INDEX NUMBERS OF WORLD MINERAL INDUSTRY EXTRACTIVE PRODUCTION

(1980=100)

Year	Coal	Crude petroleum and natural gas	Metals	Extractive industry total
Annual averages:				
1983	101.3	79.5	97.8	85.0
1984 [*]	99.9	81.9	104.6	86.9
1985 [*]	105.7	78.8	108.8	85.7
1986 [*]	106.7	81.8	109.7	88.3
1987 [*]	106.5	82.3	112.8	89.3
1988 [*]	106.6	87.1	122.8	94.5
1989 [*]	107.9	91.5	130.1	98.9
1990 [*]	98.7	92.1	135.0	98.9
1991 [*]	97.2	89.9	135.3	97.0
1992	94.2	96.0	137.7	101.5
Quarterly results:				
1991:[*]				
1st quarter	100.1	89.0	130.6	95.7
2d quarter	95.8	87.0	133.6	94.4
3d quarter	94.6	89.8	138.7	97.3
4th quarter	98.3	93.8	138.1	100.4
1992:				
1st quarter	99.0	94.9	133.9	100.5
2d quarter	92.2	93.4	137.4	99.7
3d quarter	91.5	95.7	140.5	101.3
4th quarter	94.1	100.1	139.1	104.7

^{*}Revised.

Source: 1983 only—United Nations. Monthly Bulletin of Statistics, v. 46, No. 11, Nov. 1992, p. 238; all other data—United Nations. Monthly Bulletin of Statistics, v. 47, No. 11, Nov. 1993, p. 242.

TABLE 3
INDEX NUMBERS OF MINERAL-RELATED INDUSTRY PRODUCTION

(1980=100)

Year	Non-metallic mineral products	Chemicals, petroleum, coal, rubber products	Base metals
Annual averages:			
1983	96.7	104.5	91.8
1984 ^r	98.5	110.6	97.5
1985 ^r	99.1	114.1	98.3
1986 ^r	101.8	118.7	96.3
1987 ^r	105.2	125.8	100.4
1988 ^r	111.0	134.4	108.4
1989 ^r	115.2	139.3	110.9
1990 ^r	114.5	140.1	109.9
1991 ^r	112.6	144.1	108.4
1992	113.0	151.9	108.3
Quarterly results:			
1991: ^r			
1st quarter	107.4	138.8	108.5
2d quarter	116.8	146.1	113.2
3d quarter	113.8	143.2	105.8
4th quarter	112.5	148.4	106.0
1992:			
1st quarter	108.6	145.3	108.7
2d quarter	117.3	155.8	115.9
3d quarter	113.0	150.7	105.6
4th quarter	113.5	155.9	102.9

^rRevised.

Source: 1983 only—United Nations. Monthly Bulletin of Statistics, v. 46, No. 11, Nov. 1992, p. 239; all other data—United Nations. Monthly Bulletin of Statistics, v. 47, No. 11, Nov. 1993, p. 243.

TABLE 4
WORLD PRODUCTION OF MAJOR MINERAL COMMODITIES¹

Commodity	1988	1989	1990	1991	1992*	
METALS						
Aluminum:						
Bauxite, gross weight ²	thousand metric tons	'97,428	'103,848	'108,609	'108,157	103,625
Alumina, gross weight	do.	'38,901	'41,344	'42,432	'42,468	41,493
Unalloyed ingot metal	do.	'18,495	'19,104	'19,292	'19,528	19,219
Antimony, mine output, Sb content ³	metric tons	'95,421	'105,462	'98,432	'80,379	75,659
Arsenic, trioxide	do.	'60,335	'58,026	'53,544	'43,638	47,600
Beryl concentrate, gross weight ⁴	do.	8,302	7,532	'7,144	'6,611	7,002
Bismuth:³						
Mine output, Bi content	do.	3,220	3,649	'3,347	'3,225	2,998
Smelter	do.	'3,669	'3,922	'3,730	'3,699	3,835
Cadmium, smelter	do.	'21,869	'21,427	'19,842	'20,221	18,750
Chromite, gross weight	thousand metric tons	'12,896	'14,294	'12,968	'13,445	10,896

See footnotes at end of table.

TABLE 4—Continued
WORLD PRODUCTION OF MAJOR MINERAL COMMODITIES¹

Commodity	1988	1989	1990	1991	1992*	
METALS—Continued						
Cobalt:						
Mine output, Co content	metric tons	43,819	'36,200	'35,934	'26,803	21,924
Metal, refined	do.	26,407	'25,222	'25,497	'24,243	19,991
Columbium-tantalum concentrate, gross weight ^{4 5}	do.	'40,350	'34,046	'37,015	'38,358	35,193
Copper:						
Mine output, Cu content	thousand metric tons	'8,727	'9,058	'9,017	'9,187	9,290
Metal:						
Smelter:						
Primary	do.	'8,483	'8,695	'8,425	'8,280	8,304
Secondary	do.	'1,083	'1,126	'1,048	'1,037	1,024
Refined:						
Primary ⁶	do.	'8,860	'9,071	'8,981	'8,978	9,221
Secondary ⁷	do.	'1,714	'1,848	'1,824	'1,659	1,686
Gold, mine output, Au content	kilograms	'1,873,803	'2,030,114	'2,132,953	'2,148,743	2,247,840
Iron and steel:						
Iron ore, iron ore concentrates, iron ore agglomerates, gross weight	thousand metric tons	'967,218	'998,651	'982,229	'956,224	929,754
Metal:						
Pig iron	do.	'553,395	'562,542	'550,033	'525,579	518,566
Ferroalloys	do.	'19,668	'20,171	'19,136	'17,835	16,915
Steel, crude	do.	'780,318	'786,712	'771,169	'736,007	721,315
Lead:						
Mine output, Pb content	do.	'3,325	'3,244	'3,353	'3,276	3,242
Metal:						
Smelter:						
Primary	do.	'3,249	'3,234	'3,098	'3,008	3,042
Secondary	do.	'2,531	'2,682	'2,554	'2,472	2,383
Refined:						
Primary	do.	'3,207	'3,241	'3,068	'3,016	2,994
Secondary	do.	'2,589	'2,670	'2,695	'2,587	2,548
Magnesium metal, smelter:						
Primary	metric tons	'334,365	344,448	'353,537	'339,596	303,619
Secondary	do.	75,825	81,970	'88,214	'77,301	78,923
Manganese ore, gross weight	thousand metric tons	'25,013	'26,389	'25,252	'21,213	19,929
Mercury, mine output, Hg content	metric tons	'5,357	'5,620	'4,523	'3,213	3,014
Molybdenum, mine output, Mo content	do.	'112,860	'135,799	'128,402	'117,732	111,667
Monazite concentrate (source of rare-earth metals and thorium) ³	do.	'25,710	'26,739	'24,879	'16,286	16,400
Nickel:						
Mine output, Ni content	do.	'952,215	'984,078	'965,326	'948,796	921,929
Metal, plant output	do.	'923,883	'923,595	'892,338	'894,282	852,952
Platinum-group metals, mine output, metals content	kilograms	'280,282	'281,629	'291,015	'288,338	280,889
Selenium, refinery ^{4 5}	metric tons	1,685	1,604	'1,766	'1,631	1,724
Silver, mine output, Ag content	do.	'15,484	'16,041	'16,216	'15,692	15,345
Tellurium, refinery ^{3 5}	do.	69	67	'67	'83	91

See footnotes at end of table.

TABLE 4—Continued
WORLD PRODUCTION OF MAJOR MINERAL COMMODITIES¹

Commodity	1988	1989	1990	1991	1992 ^a	
METALS—Continued						
Tin:						
Mine output, Sn content	metric tons	'204,654	'233,127	'221,651	'202,723	179,446
Metal, smelter:						
Primary ⁶	do.	'215,268	'222,765	'224,847	'192,907	189,033
Secondary ⁷	do.	'19,112	'19,789	'17,770	'13,041	8,990
Titanium concentrate, gross weight:						
Ilmenite ^{3 8}	thousand metric tons	'4,123	'4,353	'4,072	'3,411	3,581
Rutile ^{3 4}	do.	'438	'459	'481	'458	442
Titaniferous slag	do.	1,725	1,765	'1,886	'1,509	1,637
Tungsten, mine output, W content	metric tons	'50,869	'51,442	'51,845	'41,880	31,555
Uranium, mine output, U ₃ O ₈ content ⁴	do.	'44,622	'41,421	'34,316	'31,275	32,792
Vanadium, mine output, V content	do.	35,409	'35,924	'33,614	'31,616	21,917
Zinc:						
Mine output, Zn content	thousand metric tons	'6,774	'6,808	'7,184	'7,170	7,137
Metal, smelter:						
Primary ⁶	do.	'6,830	'6,837	'6,709	'6,847	6,568
Secondary ⁷	do.	'334	'353	'351	'328	307
Zirconium concentrate	do.	929	979	'853	'795	807
INDUSTRIAL MINERALS						
Asbestos	do.	'4,311	'4,259	'4,003	'3,533	3,121
Barite	do.	'5,561	'5,720	'5,633	'5,685	5,436
Boron materials	do.	'2,994	'2,988	'3,018	'2,965	2,608
Bromine ⁴	do.	'370	'401	'380	'380	379
Cement, hydraulic	do.	'1,118,480	'1,148,302	'1,148,073	'1,189,757	1,252,501
Clays:⁴						
Bentonite	do.	'9,046	'9,558	'9,242	'9,008	8,524
Fuller's earth ⁵	do.	3,006	3,010	'3,476	'3,953	3,624
Kaolin	do.	'22,985	'23,178	'23,925	'23,891	21,502
Corundum, natural	metric tons	'9,416	'9,001	'8,457	'7,111	6,000
Diamond, natural:						
Gem ⁹	thousand carats	'49,206	'50,385	'52,093	'50,694	52,063
Industrial ⁹	do.	'55,122	'55,842	'58,818	'55,156	55,703
Total ⁹	do.	'104,331	'106,242	'110,919	'105,855	107,771
Diatomite	thousand metric tons	'1,656	'1,651	'1,649	'1,626	1,581
Feldspar	do.	'4,958	'5,326	'5,456	'5,544	5,771
Fluorspar	do.	'5,282	'5,696	'5,131	'4,077	3,846
Graphite	metric tons	'575,068	'608,877	'598,256	'596,036	567,390
Gypsum	thousand metric tons	'101,291	'102,746	'100,227	'97,792	97,791
Iodine	metric tons	'14,915	'16,254	'17,014	'17,537	16,930
Lime	thousand metric tons	'133,958	'139,246	'135,631	'132,215	128,730
Magnesite ³	do.	'11,989	'11,879	'10,985	'11,166	11,129
Mica ⁴	do.	251	229	'215	'210	186
Nitrogen: N content of ammonia	do.	'99,265	'99,234	'97,110	'93,995	92,532
Perlite ⁴	do.	'1,545	'1,529	'1,582	'1,511	1,397
Phosphate, gross weight:						
Phosphate rock	do.	'164,875	'165,748	'161,528	'149,665	143,753
Thomas slag	do.	'1,551	'1,503	'1,227	'1,273	1,183
Guano	do.	10	'51	'3	'13	11

See footnotes at end of table.

TABLE 4—Continued
WORLD PRODUCTION OF MAJOR MINERAL COMMODITIES¹

Commodity	1988	1989	1990	1991	1992*
INDUSTRIAL MINERALS—Continued					
Potash, marketable, K ₂ O equivalent thousand metric tons	'31,820	'28,916	'27,772	'26,094	24,327
Pumice ^{4, 5} do.	'12,061	'11,192	'10,809	'11,603	11,142
Salt do.	'185,542	'192,473	'184,062	'192,281	184,854
Sand and gravel, industrial ^{4, 5} do.	'120,444	'120,766	'118,996	'112,102	106,308
Sodium compounds, n.e.s.:					
Soda ash do.	'31,306	'32,032	'31,938	'31,053	31,067
Sulfate do.	'4,862	'4,789	'4,751	'4,611	4,297
Strontium materials ^{4, 5} metric tons	'226,483	'275,264	'259,527	'193,752	217,100
Sulfur, elemental basis:					
Elemental ¹⁰ thousand metric tons	'14,700	15,102	'14,053	'11,225	9,373
From pyrites do.	'10,449	'10,567	'10,031	'9,881	9,542
Byproduct ¹¹ do.	'34,011	'33,629	'33,998	'33,935	33,494
Total do.	'59,160	'59,298	'58,082	'55,041	52,409
Talc, steatite, pyrophyllite, and unspecified do.	'8,811	'9,239	'9,410	'9,001	8,864
Vermiculite ⁴ metric tons	'643,498	'613,385	'577,235	'534,693	474,649
MINERAL FUELS AND RELATED MATERIALS					
Carbon black ^{4, 5} thousand metric tons	4,760	4,852	4,872	4,750	4,800
Coal:					
Anthracite million metric tons	'363	'371	'345	'347	298
Bituminous do.	'3,183	'3,275	'3,265	'3,218	3,358
Lignite do.	'1,222	'1,231	'1,139	'1,074	911
Total ⁹ do.	'4,768	'4,877	'4,749	'4,640	4,568
Coke: ¹²					
Metallurgical thousand metric tons	'326,639	'338,790	'336,770	'320,297	325,118
Other do.	'12,248	'11,712	'10,333	'6,374	5,655
Gas, natural, marketed billion cubic meters	'1,977	'2,068	'2,078	'2,111	2,156
Natural gas liquids ⁴ million 42-gallon barrels	'1,686	'1,668	'1,718	'1,819	1,916
Peat thousand metric tons	'191,269	'195,828	'179,612	'165,243	147,950
Petroleum:					
Crude million 42-gallon barrels	'21,873	'22,358	'22,605	'22,351	22,634
Refined do.	'22,913	'22,942	'23,062	'22,372	21,827

*Estimated. †Revised.

¹Figures generally conform to those published in appropriate commodity chapters of Volume I of the Minerals Yearbook, 1992 edition.

²Includes bauxite equivalent of nepheline syenite concentrate and alunite ore produced in Russia and Azerbaijan, the only producers on record of such materials as a source of aluminum metal.

³Excludes data for the United States (withheld to avoid disclosing company proprietary data).

⁴Excludes data for China (no adequate basis for estimation available).

⁵Excludes data for the former U.S.S.R. (no adequate basis for estimation available).

⁶Includes all metal clearly identified as primary as well as all metal that cannot be subdivided clearly between primary and secondary (see footnote 7).

⁷Includes only that metal that is clearly identified as secondary. Some countries do not distinguish between primary and secondary, and for some of these, no basis is available for estimating the breakdown of total production. For such countries, the total has been included under primary (see footnote 6).

⁸Includes leucocene.

⁹Data may not add to totals shown because of independent rounding.

¹⁰Comprises sulfur produced by the Frasch process plus sulfur mined in the elemental state from ores.

¹¹Comprises sulfur recovered from coal gasification, metallurgical operations (except pyrite processing), natural gas, petroleum, tar sands, spent oxides, and gypsum, whether recovered in the elemental state or as a sulfur compound.

¹²Includes production of nonmetallurgical coke by China and the former U.S.S.R.

TABLE 5
WORLD PRIMARY ENERGY PRODUCTION

(Million metric tons of standard coal equivalent)

Year	Coal	Crude petroleum and natural gas liquids	Natural gas	Primary electricity		Total
				Hydro and geothermal	Nuclear	
1981	2,635	4,250	1,859	220	99	9,063
1982	2,712	4,027	1,844	226	107	8,916
1983	2,719	3,982	1,856	237	124	8,918
1984	2,851	4,032	2,022	245	150	9,300
1985	3,062	3,985	2,098	250	178	9,573
1986	3,075	4,178	2,124	253	191	9,821
1987	3,202	4,198	2,227	255	210	10,092
1988	3,293	4,140	2,388	266	226	10,313
1989 ^r	3,350	4,206	2,481	266	233	10,536
1990 ^r	3,266	4,294	2,552	275	244	10,631
1991 ^r	3,197	4,260	2,603	280	256	10,596
1992 ^a	3,100	4,400	2,600	280	260	10,640

^rEstimated. ^aRevised.

Sources: 1981—United Nations. 1984 Energy Statistics Yearbook, New York, 1986, pp. 441; 1982—United Nations. 1985 Energy Statistics Yearbook, New York, 1987, pp. 437; 1983—United Nations. 1986 Energy Statistics Yearbook, New York, 1988, pp. 433; 1984—United Nations. 1987 Energy Statistics Yearbook, New York, 1989, pp. 451; 1985—United Nations. 1988 Energy Statistics Yearbook, New York, 1990, pp. 449; 1986—United Nations. 1989 Energy Statistics Yearbook, New York, 1991, pp. 440; 1987—United Nations. 1990 Energy Statistics Yearbook, New York, 1992, pp. 482; 1988-91—United Nations. 1991 Energy Statistics Yearbook, New York, 1993, pp. 448; 1992—U.S. Bureau of Mines estimates.

TABLE 6
WORLD ELECTRIC POWER PRODUCTION, BY GENERATING PLANT TYPE

Source plant type	1982		1988		1989	
	Production (billion kilowatt hours)	Share of total (percent)	Production (billion kilowatt hours)	Share of total (percent)	Production (billion kilowatt hours)	Share of total (percent)
Primary electricity:						
Hydroelectric	1,823	21.4	2,130	19.2	2,126	18.5
Geothermal	17	.2	36	.3	39	.3
Nuclear	870	10.2	1,837	16.5	1,896	16.5
Subtotal	2,710	31.9	4,003	36.0	4,061	35.3
Secondary electricity:						
Thermal	5,792	68.1	7,117	64.0	7,446	64.7
Total	8,502	100.0	11,120	100.0	11,507	100.0
Source plant type	1990		1991		1992 ^a	
	Production (billion kilowatt hours)	Share of total (percent)	Production (billion kilowatt hours)	Share of total (percent)	Production (billion kilowatt hours)	Share of total (percent)
Primary electricity:						
Hydroelectric	2,200	18.6	2,235	18.6	2,240	18.4
Geothermal	40	.3	39	.3	40	.3
Nuclear	1,979	16.8	2,078	17.3	2,110	17.3
Subtotal	4,219	35.7	4,352	36.2	4,390	36.0
Secondary electricity:						
Thermal	7,584	64.3	7,681	63.8	7,800	64.0
Total	11,803	100.0	12,033	100.0	12,190	100.0

^rEstimated. ^aRevised.

¹Data do not add to total shown because of independent rounding.

Source: 1982—United Nations. 1985 Energy Statistics Yearbook, New York, 1987, p. 380; 1988-91—United Nations. 1991 Energy Statistics Yearbook, New York, 1993, p. 392; 1992—estimated by U.S. Bureau of Mines based on Department of Energy and UN data.

TABLE 7
WORLD ELECTRIC POWERPLANT CAPACITY, BY GENERATING PLANT TYPE

Plant type	1982		1988		1989	
	Capacity (million kilowatts)	Share of total (percent)	Capacity (million kilowatts)	Share of total (percent)	Capacity (million kilowatts)	Share of total (percent)
Primary plants:						
Hydroelectric	505	23.1	618	23.3	630	23.0
Geothermal	3	.1	7	.3	8	.3
Nuclear	171	7.8	317	12.0	330	12.0
Subtotal	679	31.0	942	35.5	968	35.3
Secondary plants:						
Thermal	1,508	69.0	1,710	64.5	1,775	64.7
Total	2,187	100.0	2,652	100.0	2,743	100.0
Plant type	1990		1991		1992*	
	Capacity (million kilowatts)	Share of total (percent)	Capacity (million kilowatts)	Share of total (percent)	Capacity (million kilowatts)	Share of total (percent)
Primary plants:						
Hydroelectric	641	22.9	653	22.9	660	23.0
Geothermal	9	.3	9	.3	9	.3
Nuclear	338	12.0	344	12.1	350	12.2
Subtotal	988	35.2	1,006	35.3	1,019	35.5
Secondary plants:						
Thermal	1,817	64.8	1,841	64.7	1,850	64.5
Total	2,805	100.0	2,847	100.0	2,869	100.0

*Estimated. Revised.

¹Data do not add to total shown because of independent rounding.

Sources: 1982—United Nations. 1985 Energy Statistics Yearbook, New York, 1987 p. 324; 1988-92—United Nations. 1991 Energy Statistics Yearbook, New York, 1993, p. 332; 1992—estimates by U.S. Bureau of Mines based on Department of Energy and UN data.

TABLE 8
VALUE OF WORLD MINERAL COMMODITY EXPORT TRADE AND ITS ROLE IN WORLD TRADE

Year	Value of mineral commodity export trade (million current dollars)			Change in total from previous year (percent)	Mineral commodities' share of all commodities exported (percent)
	Mineral fuels	Nonfuel minerals ¹	Total		
1980	480,789	226,761	707,550	35.7	35.4
1981	474,266	199,328	673,594	(4.8)	34.3
1982	430,384	180,950	611,334	(9.2)	33.1
1983	384,188	174,724	558,912	(8.6)	30.8
1984	378,398	184,701	563,099	.7	29.5
1985	361,646	188,673	550,319	(2.3)	28.5
1986	260,126	194,258	454,384	(17.4)	21.6
1987	280,401	218,346	498,747	9.8	20.1
1988	262,975	273,328	536,303	7.5	19.0
1989	292,144	304,867	597,011	11.3	19.7
1990	348,171	302,819	650,990	9.0	19.2
1991	326,073	290,895	616,968	(5.3)	17.9

*Estimated. NA Not available.

¹In part estimated, based on data for major commodity groups presented in table 9 of this chapter.

TABLE 9
VALUE OF EXPORT TRADE IN MAJOR MINERAL COMMODITY GROUPS¹

(Million U.S. dollars)

Commodity group	1985	1986	1987	1988	1989	1990	1991
Metals:							
All ores, concentrates, scrap	24,943	23,879	26,440	^r 31,807	^r 37,782	36,271	34,126
Iron and steel	70,318	74,025	80,850	98,626	^r 107,456	107,326	106,656
Nonferrous metals	35,656	36,617	44,567	^r 60,732	^r 67,865	68,922	63,896
Total	130,917	134,521	151,857	191,165	^r 213,103	212,519	204,678
Nonmetals, crude only	9,963	10,534	11,185	12,993	13,645	13,600	12,533
Mineral fuels	361,646	260,126	280,401	^r 262,975	^r 292,144	^r 348,171	326,073
Grand total	502,526	405,181	443,443	^r 467,133	^r 518,892	^r 574,290	543,284
All commodities	1,933,434	2,104,252	2,477,240	^r 2,819,120	^r 3,024,778	^r 3,396,506	3,438,850

^rRevised.

¹Data presented are for selected major commodity groups of the Standard International Trade Classification, Revision 2 (SITC-R2) and as such exclude some mineral commodities classified in that data array together with other (nonmineral) commodities. SITC-R2 categories included are as follows: All ores, concentrates, scrap-Div. 28; iron and steel-Div. 67; nonferrous metals-Div. 68; nonmetals (crude only)-Div. 27; and mineral fuels-Div. 3. Major items not included are the metals, metalloids, and metal oxides of Group 513; mineral tar and other coal-, petroleum-, and gas-derived crude chemicals of Div. 52; manufactured fertilizers of Div. 56; and nonmetallic mineral manufactures of Groups 661, 662, 663, and 667. Data include special category exports, ship stores and bunkers, and other exports of minor importance, and exclude the trade between the Federal Republic of Germany and the German Democratic Republic. Data for centrally planned economy countries of Asia are based on imports of China. Sources: 1988-91 data: United Nations. Monthly Bulletin of Statistics, v. 46, May 1993, pp. 258-307; 1987 data: United Nations. Monthly Bulletin of Statistics, v. 46, May 1992, pp. 262-309; 1986 data: United Nations. Monthly Bulletin of Statistics, v. 45, May 1991, pp. 260-303; 1985 data: United Nations. Monthly Bulletin of Statistics, v. 44, May 1990, pp. 260-303.

TABLE 10
DISTRIBUTION OF VALUE OF WORLD EXPORT TRADE IN MAJOR MINERAL COMMODITY GROUPS¹

(Percent)

Commodity group	1985	1986	1987	1988	1989	1990	1991
Metals:							
All ores, concentrates, scrap	5.0	5.9	6.0	6.8	7.3	^r 6.3	6.3
Iron and steel	14.0	18.3	18.2	21.1	20.7	^r 18.7	19.6
Nonferrous metals	7.0	9.0	10.1	13.0	13.1	^r 12.0	11.8
Total	26.0	33.2	34.3	40.9	41.1	^r 37.0	37.7
Nonmetals, crude only	2.0	2.6	2.5	2.8	2.6	2.4	2.3
Mineral fuels	72.0	64.2	63.2	56.3	56.3	^r 60.6	60.0

^rRevised.

¹For detailed definition of groups, see footnote 1, table 9.

TABLE 11
GROWTH OF VALUE OF WORLD EXPORT TRADE IN MAJOR MINERAL COMMODITY GROUPS¹

(Percent change from that of previous year)

Commodity group	1985	1986	1987	1988	1989	1990	1991
Metals:							
All ores, concentrates, scrap	(-3.2)	(-4.3)	+10.7	+20.3	+18.8	(-4.0)	(-5.9)
Iron and steel	+6.3	+5.3	+9.2	+22.0	^r +9	^r (-1)	(-6)
Nonferrous metals	(-1.5)	+2.7	+21.7	+36.3	+11.7	^r +1.6	(-7.3)
All metals	+2.2	+2.8	+12.9	+25.9	+11.5	(-3)	(-3.7)
Nonmetals, crude only	+1.1	+5.7	+6.2	+16.2	+5.0	(-3)	(-7.9)
Mineral fuels	(-4.4)	(-28.1)	+7.8	(-6.2)	+11.1	^r +19.2	(-6.4)
All major mineral commodity groups	(-2.7)	(-19.4)	+9.4	+5.3	+11.1	^r +10.7	(-5.4)
All commodities	+1.3	+8.8	+17.7	+13.8	+7.3	^r +12.3	+1.2

^rRevised.

¹For detailed definition of groups, see footnote 1, table 9.

TABLE 12
WORLD CONSUMPTION OF SELECTED MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

Commodity	1988	1989	1990	1991	1992
Ferrous metals:					
Iron ore, gross weight ^a million metric tons	897	923	911	880	*850
Iron and steel scrap, gross weight do.	*367	*367	*360	*334	*325
Nonferrous metals:					
Aluminum, refined	17,755	*18,123	17,841	*18,534	19,219
Cadmium	20	20	19	20	20
Copper, refined	10,530	*10,989	*10,802	*10,646	10,805
Lead, refined	*5,725	*5,858	*5,566	*5,207	5,150
Magnesium, primary	343	341	*344	*319	318
Nickel ¹	857	852	856	*802	750
Tin, refined	234	234	230	*217	200
Zinc, slab	*7,172	*7,049	*6,965	*6,611	6,472
Industrial minerals:					
Cement million metric tons	1,112	1,135	1,151	1,186	*1,250
Fertilizers:²					
Nitrogenous, contained N	97,510	99,636	*95,863	*92,025	90,598
Phosphatic, contained P ₂ O ₅	*37,610	*37,235	*35,959	*33,601	*33,000
Potassic, K ₂ O equivalent	27,126	27,852	26,683	25,070	*22,000
Sulfur, elemental S equivalent	63,065	61,106	*61,609	*58,698	56,503
Mineral fuels:					
Solid fuels million metric tons of standard coal equivalent					
Liquid fuels do.	*3,353	*3,370	*3,248	*3,205	*3,100
Natural gas do.	*3,980	*4,031	*4,036	*4,066	*4,200
Primary electricity:					
Hydro and geothermal million metric tons of standard coal equivalent	265	263	272	280	*280
Nuclear do.	226	*233	244	*256	*260
Total do.	*10,212	*10,373	*10,328	*10,411	*10,440

^aEstimated. *Revised.

¹Nickel content of refined nickel, ferronickel, and nickel oxide.

²Data are for years ending June 30 of that stated.

Sources: Based on data provided by the World Bureau of Metal Statistics (nonferrous metals, cadmium); Metallgesellschaft AG (nonferrous metals except cadmium); European Cement Association (Cembureau). World Statistical Review Nos. 13A and 13B/Special Edition, and World Cement Market in Figures 1913/1990, Brussels 1992, 237 pp.; British Sulphur Corp. Ltd. (fertilizer materials and sulfur); and 1991 United Nations Energy Statistics Yearbook (all mineral fuels for 1988-91). Data on iron ore and iron and steel scrap for all years and on mineral fuels for 1992 are compiled from a variety of sources by the U.S. Bureau of Mines.

TABLE 13
ANNUAL INVESTMENT IN THE STEEL INDUSTRY FOR SELECTED COUNTRIES

(Million dollars)

Country or country group	1988	1989	1990
Organization for Economic Cooperation and Development (OECD):			
European Community:			
Belgium	432	¹ 571	693
France	516	793	660
Germany	788	¹ 1,244	2,034
Greece	11	¹ 13	28
Ireland and Denmark	8	¹ 12	14
Italy	675	¹ 134	145
Luxembourg	67	95	83
Netherlands	197	² 253	218
Portugal	28	103	145
Spain	401	438	416
United Kingdom	583	¹ 724	459
Subtotal	3,706	⁴ 4,380	4,895
EFTA ¹	1,041	¹ 1,001	738
Other:²			
Australia	NA	NA	NA
Canada	500	⁵ 554	538
Japan	5,299	⁶ 6,851	8,329
Turkey	NA	NA	NA
United States	2,273	2,500	2,300
Subtotal ³	8,072	⁹ 9,905	11,167
Total OECD ^{3,4}	12,819	¹⁵ 15,286	16,800
Latin America:⁵			
Argentina	74	61	62
Brazil	362	501	313
Chile	112	43	40
Colombia	47	25	12
Ecuador	NA	NA	(⁶)
Mexico	495	185	296
Paraguay	NA	(⁶)	—
Peru	6	6	5
Uruguay	1	(⁶)	—
Venezuela	214	209	112
Central America	6	41	26
Total	³ 1,317	¹ 1,071	866
Grand total ³	14,136	¹⁶ 16,357	17,666

¹Revised. NA Not available.

²European Free Trade Association (EFTA) figures exclude data for Switzerland.

³Data for New Zealand have not been available since 1979.

⁴Incomplete total; does not include Countries indicated as "NA."

⁵Sources for OECD: The Iron and Steel Industry in 1989. Paris, 1991, p. 34; The Iron and Steel Industry in 1990. Paris, 1992, p. 36. The Iron and Steel Industry in 1991. Paris, 1993, p. 34.

⁶Source for Latin America: Instituto Latinoamericano del Fierro y el Acero. Statistical Yearbook of Steelmaking and Iron Ore Mining in Latin America 1992. Santiago, p. 211.

⁶Less than 1/2 unit.

TABLE 14
MARKET ECONOMY COUNTRY PETROLEUM INDUSTRY CAPITAL SPENDING, BY GEOGRAPHIC AREA

(Million dollars)

Area and type of expenditure	1988	1989	1990	1991	1992
United States and Canada:					
Crude oil and natural gas	28,320	24,920	26,650	^{26,280}	23,470
Natural gas liquids plants	790	840	870	⁹³⁰	940
Refineries	3,490	3,690	4,900	6,370	7,100
Total	<u>32,600</u>	<u>29,450</u>	<u>32,420</u>	<u>^{33,580}</u>	<u>31,510</u>
Mexico, Central and South America:					
Crude oil and natural gas	6,125	4,695	4,510	^{5,020}	5,060
Refineries	1,500	1,500	1,700	^{1,800}	1,900
Total	<u>7,625</u>	<u>6,195</u>	<u>6,210</u>	<u>^{6,820}</u>	<u>6,960</u>
Western Europe:					
Crude oil and natural gas	13,115	11,540	11,900	^{12,340}	11,230
Refineries	2,500	2,700	2,700	^{2,900}	3,050
Total	<u>15,615</u>	<u>14,240</u>	<u>14,600</u>	<u>^{15,240}</u>	<u>14,280</u>
Africa and Middle East:					
Crude oil and natural gas	2,915	2,790	2,970	^{2,870}	3,470
Refineries	1,000	1,000	1,000	1,200	1,300
Total	<u>3,915</u>	<u>3,790</u>	<u>3,970</u>	<u>^{4,070}</u>	<u>4,770</u>
Asia and Pacific:					
Crude oil and natural gas	2,295	2,305	2,330	^{2,380}	2,640
Refineries	2,000	2,050	2,100	^{2,180}	2,400
Liquefied natural gas plants	1,300	1,300	1,400	^{1,570}	1,760
Total	<u>5,595</u>	<u>5,655</u>	<u>5,830</u>	<u>^{6,130}</u>	<u>6,800</u>
Tankers (all areas)	1,500	1,700	2,000	^{2,160}	2,370
Grand total	<u>66,850</u>	<u>61,030</u>	<u>65,030</u>	<u>^{68,000}</u>	<u>66,690</u>
Of which:					
Crude oil and natural gas	52,770	46,250	48,360	^{48,890}	45,870
Natural gas liquids plants	790	840	870	⁹³⁰	940
Refineries	10,490	10,940	12,400	^{14,450}	15,750
Liquefied natural gas plants	1,300	1,300	1,400	^{1,570}	1,760
Tankers	1,500	1,700	2,000	^{2,160}	2,370

¹Revised.

Source: Oil & Gas Journal.

TABLE 15
SALIENT STATISTICS ON U.S. FOREIGN INVESTMENT IN MINERAL INDUSTRY ACTIVITIES

(Million dollars; inflows [-])

	1988	1989	1990	1991	1992
Direct foreign investment: Total	<u>335,893</u>	<u>381,781</u>	<u>426,958</u>	<u>460,955</u>	<u>486,670</u>
Of which:					
Mining:					
Metals	3,008	2,823	3,470	2,943	3,890
Nonmetallic minerals, except fuels	452	417	434	444	448
Coal	1,390	1,893	1,685	2,047	2,117
Primary and fabricated metals	7,939	8,175	10,474	9,819	10,109
Petroleum	57,807	51,393	56,957	59,160	55,207
Reinvested earnings of foreign affiliates:					
Total	<u>13,327</u>	<u>12,697</u>	<u>18,954</u>	<u>16,174</u>	<u>17,620</u>
Of which: ¹					
Primary and fabricated metals	1,176	952	601	307	466
Petroleum	-1,112	-1,676	1,727	2,074	-1,476
Equity and intercompany account flows:					
Total	<u>11,767</u>	<u>43,999</u>	<u>36,444</u>	<u>49,379</u>	<u>45,129</u>
Of which: ¹					
Primary and fabricated metals	1,105	1,798	2,582	-1,231	914
Petroleum	-1,768	-10,934	4,407	3,463	-275
Income: Total	<u>50,429</u>	<u>53,929</u>	<u>57,746</u>	<u>51,152</u>	<u>50,708</u>
Of which:					
Mining:					
Metals	388	562	462	315	531
Nonmetallic minerals, except fuels	59	—	—	—	—
Coal	-101	-151	17	17	48
Primary and fabricated metals	1,573	1,541	1,133	665	767
Petroleum	7,727	5,454	9,844	10,012	7,941

¹Revised.

¹Mining data not available.

Source: U.S. Department of Commerce. Survey of Current Business, v. 73, No. 7, July 1993.

TABLE 16
WORLD MERCHANT FLEET DISTRIBUTION, BY TYPE¹

	1988	1989	1990	1991	1992	
Number of vessels:						
Bulk carriers	5,332	5,335	5,446	5,473	5,420	
Freighters ²	12,518	12,195	12,441	12,581	12,339	
Tankers	5,250	5,133	5,361	5,542	5,642	
Other ³	368	320	348	347	352	
Total	23,468	22,983	23,596	23,943	23,753	
Gross tonnage:						
Bulk carriers	thousand long tons	130,225	131,135	137,154	139,295	138,712
Freighters ²	do.	95,932	94,780	97,296	99,931	101,635
Tankers	do.	140,833	137,129	147,815	153,309	156,683
Other ³	do.	4,367	3,720	4,471	4,690	5,187
Total	do.	371,357	366,764	386,736	397,225	402,217
Deadweight tonnage:						
Bulk carriers	do.	227,515	233,139	244,253	247,679	246,983
Freighters ²	do.	118,077	118,060	120,037	122,349	123,179
Tankers	do.	254,796	251,923	271,749	280,572	285,009
Other ³	do.	1,531	1,367	1,454	1,425	1,420
Total	do.	601,919	604,489	637,493	652,025	656,591

¹Maritime Administration classification. Tankers include whaling tankers. Vessels shown here as "Other" include combination passenger and cargo and combination passenger and refrigerated cargo. Data are as of Dec. 31 of the year indicated.

²Includes refrigerated freighters.

³Excludes refrigerated freighters.

Source: U.S. Department of Transportation, Maritime Administration.

TABLE 17
WORLD BULK CARRIER FLEET,
BY DEADWEIGHT TONNAGE OF
COUNTRY OF REGISTRY AS OF
DECEMBER 31, 1992

Country of registry	Number of vessels	Deadweight tonnage (thousand long tons)
Liberia	540	32,001
Panama	717	29,587
Greece	458	22,134
Cyprus	488	19,840
Japan	251	15,992
Norway (NIS)	219	11,079
Philippines	251	10,871
China	285	9,181
Malta	255	9,163
Hong Kong ¹	104	8,839
Bahamas, The	147	7,690
Korea, Republic of	130	7,013
India	119	4,994
Taiwan	60	4,622
Singapore	82	4,480
Brazil	77	4,250
Italy	60	4,208
Turkey	93	3,987
Saint Vincent ¹	97	3,286
Russia	135	3,209
Poland	85	2,740
Vanuatu	52	1,948
Romania	50	1,820
Iran	50	1,757
Australia	30	1,685
Luxembourg	17	1,630
Marshall Island	18	1,163
Denmark (DIS)	14	1,029
Other	536	16,785
Total	5,420	246,983

¹Previously reported as "British Dependencies."

Source: U.S. Department of Transportation, Maritime Administration.

TABLE 18
WORLD FREIGHTER FLEET, BY
DEADWEIGHT TONNAGE OF
COUNTRY OF REGISTRY AS OF
DECEMBER 31, 1992

Country of registry	Number of vessels	Deadweight tonnage (thousand long tons)
Panama	1,719	16,325
China	752	7,438
United States	349	7,232
Russia	1,006	6,369
Liberia	367	6,363
Cyprus	616	5,996
Bahamas, The	380	5,213
Germany	351	4,263
Malta	343	3,313
Singapore	227	3,168
Japan	351	3,077
Taiwan	134	2,852
Denmark (DIS)	189	2,563
Netherlands	285	2,403
Saint Vincent ¹	285	2,313
Korea, Republic of	225	2,307
Greece	193	2,258
Norway (NIS)	193	2,049
Philippines	239	1,833
Romania	193	1,535
Italy	172	1,355
India	97	1,339
Indonesia	247	1,310
Hong Kong ¹	64	1,286
Poland	119	1,111
France	45	1,084
Turkey	189	1,039
Sweden	90	1,035
United Kingdom	58	1,032
Other	2,861	23,718
Total	12,339	123,179

¹Previously reported as "British Dependencies."

Source: U.S. Department of Transportation, Maritime Administration.

TABLE 19
WORLD TANKER FLEET, BY
DEADWEIGHT TONNAGE OF
COUNTRY OF REGISTRY AS OF
DECEMBER 31, 1992

Country of registry	Number of vessels	Deadweight tonnage (thousand long tons)
Liberia	639	58,679
Panama	704	33,375
Norway (NIS)	311	22,173
Greece	231	21,639
Bahamas, The	242	19,034
United States	220	14,180
Japan	296	13,437
Cyprus	140	9,766
Singapore	184	7,729
Iran	36	5,938
Malta	147	5,468
Bermuda ¹	35	4,822
Italy	217	4,110
Brazil	83	3,834
Russia	211	3,781
India	77	3,693
France	48	3,485
Kuwait	30	3,422
Marshall Islands ¹	9	2,737
Denmark (DIS)	78	2,717
China	170	2,685
Spain	61	2,384
Hong Kong ¹	31	1,853
United Kingdom	59	1,731
Isle of Man	28	1,726
Sweden	67	1,723
Taiwan	21	1,672
Turkey	54	1,551
Australia	23	1,539
Saint Vincent ¹	47	1,503
Iraq	18	1,347
Netherlands	58	1,206
Mexico	41	1,123
Libya	13	1,103
Malaysia	54	1,011
Other	959	16,833
Total	5,642	285,009

¹Previously reported as "British Dependencies."

Source: U.S. Department of Transportation, Maritime Administration.

TABLE 20
PANAMA CANAL: TRANSITS AND COMMODITY MOVEMENTS

	Fiscal Year ¹				
	1988	1989	1990	1991	1992
Number of transits:					
Commercial ocean traffic	12,234	11,989	11,941	12,572	12,454
Other traffic	1,207	1,400	1,384	1,536	1,694
Total	13,441	13,389	13,325	14,108	14,148
Charge moved (thousand metric tons):					
Commercial ocean traffic:					
Mineral commodities	69,586	69,461	74,491	74,989	71,185
Other commodities	89,408	84,609	85,103	90,318	90,644
Subtotal	158,994	154,070	159,594	165,307	161,829
Other traffic	303	236	254	525	347
Total	159,297	154,306	159,848	165,832	162,176

¹Year ending Sept. 30 of that stated.

Source: Panama Canal Commission Annual Report 1992.

TABLE 21
MOVEMENT OF MINERAL COMMODITIES THROUGH THE PANAMA CANAL¹

(Thousand metric tons)

	1990			1991			1992		
	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total
METALS									
Ore and concentrate:									
Bauxite and alumina	233	3,089	3,322	165	1,733	1,898	162	781	943
Chromite	6	47	53	74	19	93	63	28	91
Copper	68	479	547	26	496	522	28	1,054	1,082
Iron	185	420	605	164	300	464	122	414	536
Lead	8	228	236	15	247	262	5	185	190
Manganese	87	318	405	93	175	268	142	132	274
Tin	—	12	12	—	4	4	2	2	4
Zinc	30	775	805	24	942	966	35	1,178	1,213
Other and unspecified	192	2,162	2,354	238	2,561	2,799	191	1,862	2,053
Subtotal	809	7,530	8,339	799	6,477	7,276	750	5,636	6,386
Ingots and semimanufactures:									
Aluminum	416	13	429	511	12	523	472	9	481
Copper	8	906	914	3	994	997	7	715	722
Iron and steel ^{2 3}	6,833	3,040	9,873	7,865	2,872	10,737	5,610	2,908	8,518
Lead	15	81	96	1	106	107	2	67	69
Tin ²	11	11	22	12	8	20	17	8	25
Zinc	7	224	231	8	181	189	4	168	172
Other	49	19	68	42	41	83	43	72	115
Subtotal	7,339	4,294	11,633	8,442	4,214	12,656	6,155	3,947	10,102
Total	8,148	11,824	19,972	9,241	10,691	19,932	6,905	9,583	16,488
INDUSTRIAL MINERALS									
Borax	3	431	434	1	404	405	1	374	375
Cement	552	5	557	963	5	968	323	2	325
Clays, fire and china	633	88	721	719	21	740	736	16	752
Fertilizer materials	11,901	2,112	14,013	13,367	1,587	14,954	12,660	1,353	14,013
Salt	34	1,396	1,430	29	1,157	1,186	37	843	880

See footnotes at end of table.

TABLE 21—Continued
MOVEMENT OF MINERAL COMMODITIES THROUGH THE PANAMA CANAL¹

(Thousand metric tons)

	1990			1991			1992		
	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total
INDUSTRIAL MINERALS—Continued									
Sulfur	66	2,753	2,819	—	3,001	3,001	8	2,638	2,646
Other ⁴	334	271	605	446	337	783	252	639	891
Total	13,523	7,056	20,579	15,525	6,512	22,037	14,017	5,865	19,882
MINERAL FUELS									
Carbon black	28	1	29	82	11	93	115	2	117
Coal and coke	5,146	3,100	8,246	4,710	3,816	8,526	4,495	4,556	9,051
Petroleum:									
Crude	2,730	6,681	9,411	3,267	5,105	8,372	4,416	3,999	8,415
Refined	9,183	7,071	16,254	9,982	6,047	16,029	9,183	8,049	17,232
Subtotal	11,913	13,752	25,665	13,249	11,152	24,401	13,599	12,048	25,647
Total	17,087	16,853	33,940	18,041	14,979	33,020	18,209	16,606	34,815
Grand total	38,758	35,733	74,491	42,807	32,182	74,989	39,131	32,054	71,185

¹Fiscal year ended Sept. 30 of that stated.

²Tinplate is included under "Tin" as in the source publication rather than under "Iron and Steel."

³Includes a category identified simply as "Scrap" in source publication, which may include scrap other than iron and steel scrap.

⁴Comprises asbestos, bricks and tile, clinkers, dross, marble and other stone, slag, and soda and other sodium compounds.

Source: Panama Canal Commission Annual Report 1992.

TABLE 22
NONFERROUS METAL PRICES IN THE UNITED STATES

(Average cents per pound unless otherwise specified)

Year and month	Aluminum ¹	Cadmium ²	Cobalt ³	Copper ⁴	Lead ⁵	Nickel ⁶	Silver ⁷	Tin ⁸	Zinc ⁹
1988	110.087	7.598	7.09	119.107	37.140	6.091	6.535	3.310	60.197
1989	87.843	6.278	7.64	129.534	39.350	5.982	5.499	3.973	82.019
1990	74.040	3.378	10.09	121.764	46.022	4.074	4.820	2.876	74.593
1991	59.461	2.009	16.92	107.927	33.484	3.796	4.039	2.588	52.772
1992:									
January	53.667	1.464	30.85	99.323	34.485	3.416	4.121	2.538	54.498
February	58.197	1.100	28.25	103.628	34.294	3.588	4.137	2.591	52.885
March	59.284	1.136	28.09	104.783	34.301	3.405	4.104	2.616	56.945
April	61.034	1.000	27.00	103.338	34.377	3.405	4.030	2.709	60.528
May	59.988	.965	26.75	103.525	34.267	3.352	4.068	2.854	63.167
June	58.420	.759	25.50	107.702	34.526	3.248	4.056	3.038	63.754
July	59.815	.787	22.00	117.250	36.334	3.363	3.949	3.230	62.391
August	59.648	.800	19.75	115.740	38.694	3.288	3.797	3.136	64.951
September	58.150	.800	18.66	111.095	38.491	3.115	3.763	3.063	65.372
October	53.726	.776	15.31	103.754	35.908	2.853	3.737	2.784	55.958
November	52.763	.700	16.11	99.990	33.073	2.499	3.763	2.648	50.006
December	55.534	.618	15.89	102.144	32.469	2.587	3.710	2.661	50.121
Average	57.519	.909	22.85	106.023	35.102	3.177	3.936	2.822	58.381

¹Metals Week U.S. market price.

²U.S. dollars per pound: 1988—producer; 1989-92—New York dealer market price.

³U.S. dollars per pound, average annual spot for cathodes.

⁴Electrolytic, f.o.b. refinery, producer.

⁵Refined lead, North America producer price.

⁶U.S. dollars per pound, New York dealers, cathode.

⁷U.S. dollars per troy ounce, 0.999 fine, New York.

⁸U.S. dollars per pound, New York dealer.

⁹United States high-grade.

Source: American Bureau of Metal Statistics Inc., except cobalt, which is compiled by the U.S. Bureau of Mines.

TABLE 23
NONFERROUS METAL PRICES ON THE LONDON METAL EXCHANGE¹

(Average cents per pound unless otherwise specified)

Year and month	Aluminum ¹	Copper ²	Gold ³	Lead ⁴	Silver ⁵	Tin ⁶	Zinc ⁷
1988	117.334	118.010	437.047	29.727	6.531	3.199	56.262
1989	88.508	129.201	381.431	30.513	5.507	3.871	75.124
1990	74.364	120.723	383.466	36.717	4.832	2.760	¹ 68.850
1991	59.067	106.860	362.179	25.269	4.055	2.484	50.671
1992:							
January	53.391	97.034	354.448	23.335	4.121	2.442	52.332
February	57.462	100.061	353.913	22.885	4.146	2.495	51.289
March	58.081	101.030	344.336	23.625	4.110	2.494	55.090
April	59.740	100.486	338.618	24.150	4.053	2.593	59.160
May	59.275	100.541	337.239	23.579	4.075	2.719	62.272
June	57.858	104.294	340.805	24.839	4.064	2.941	62.831
July	59.559	114.315	352.720	28.364	3.968	3.126	59.883
August	59.196	114.379	343.058	29.661	3.818	3.047	61.707
September	57.589	109.503	345.430	28.147	3.770	2.982	62.003
October	53.242	102.018	344.380	24.354	3.750	2.699	52.780
November	52.574	97.898	335.017	20.865	3.771	2.548	47.487
December	54.753	100.100	334.803	20.602	3.726	2.537	47.986
Average	56.893	103.472	343.731	24.534	3.948	2.719	56.235

¹Revised.

²Unalloyed ingot, 99.5%.

³Grade A settlement price.

⁴U.S. dollars per troy ounce, final price.

⁵Refined lead, monthly average cash price.

⁶U.S. dollars per troy ounce, 0.999 fine, spot price.

⁷U.S. dollars per pound, Kuala Lumpur tin market price.

⁸Monthly average cash price, high-grade.

Source: American Bureau of Metal Statistics Inc.

TABLE 24
LEADING WORLD PRODUCERS OF BAUXITE¹

(Thousand metric tons)

Country	1988	1989	1990	1991	1992 ²
Australia	36,192	38,583	41,391	40,503	² 39,950
Guinea	¹ 15,624	¹ 15,362	¹ 15,340	¹ 14,899	13,773
Jamaica	7,305	9,601	10,921	11,552	11,302
Brazil	8,083	8,665	¹ 9,700	¹ 10,414	10,800
India	3,961	4,768	4,852	¹ 4,738	4,475
Russia ³	—	—	—	—	4,000
Suriname	3,434	3,530	³ 3,283	3,198	3,250
China ⁴	2,300	2,388	2,400	2,600	3,000
Guyana	¹ 1,339	1,321	1,424	2,204	2,300
Greece	2,433	2,602	2,504	² 2,133	2,100
Hungary	2,593	2,644	2,559	2,037	1,721
Sierra Leone	1,379	1,562	1,430	1,288	1,246
Venezuela	522	702	771	1,992	1,052
U.S.S.R. ⁴	5,500	5,500	5,500	5,000	—
Total	¹ 90,665	¹ 97,228	¹ 102,075	¹ 102,558	98,969
Other	¹ 6,763	¹ 6,620	¹ 6,534	¹ 5,599	4,656
Grand total	¹ 97,428	¹ 103,848	¹ 108,609	¹ 108,157	103,625

¹Estimated. ²Revised.

³Table includes data available through June 15, 1993.

⁴Reported figure.

⁵Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁶Dissolved in Dec. 1991.

TABLE 25
LEADING WORLD PRODUCERS OF ALUMINUM¹

(Thousand metric tons)

Country	1988	1989	1990	1991	1992 ²
United States	3,944	4,030	4,048	4,121	² 4,042
Russia ³	—	—	—	—	2,700
Canada	1,534	1,555	1,567	¹ 1,822	² 1,950
Australia	1,150	1,244	1,234	1,235	² 1,216
Brazil	874	890	931	1,140	1,200
China ⁴	710	850	850	860	950
Norway	864	863	845	833	² 813
Germany	814	788	¹ 735	690	600
Venezuela	437	540	590	¹ 601	600
India	375	423	433	¹ 504	500
France	328	335	326	286	417
Spain	323	352	355	355	350
Tajikistan ³	—	—	—	—	300
Bahrain	183	187	213	¹ 227	290
New Zealand	264	¹ 260	260	259	² 242
United Arab Emirates: Dubai	162	168	174	239	240
United Kingdom	300	297	290	294	240
Netherlands	278	¹ 274	270	264	235
Italy	226	219	232	¹ 206	180
Ghana	161	169	174	175	178
U.S.S.R. ⁴	¹ 3,350	¹ 3,300	³ 3,523	³ 3,251	—
Total	¹ 16,277	¹ 16,744	¹ 17,050	¹ 17,362	17,243
Other	¹ 2,218	¹ 2,360	¹ 2,242	¹ 2,166	1,976
Grand total	¹ 18,495	¹ 19,104	¹ 19,292	¹ 19,528	19,219

¹Estimated. ²Revised.

³Table includes data available through June 2, 1993.

⁴Reported figure.

⁵Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁶Dissolved in Dec. 1991.

TABLE 26
LEADING WORLD PRODUCERS OF CHROMITE¹

(Thousand metric tons, gross weight)

Country	1988	1989	1990	1991	1992 ²
Kazakhstan ²	—	—	—	—	³ 3,600
South Africa, Republic of	4,245	4,951	4,618	⁵ 5,110	³ 3,361
India	821	1,003	939	⁹ 995	1,000
Turkey ⁴	851	¹ 1,100	⁸ 800	⁸ 870	850
Zimbabwe	⁵ 561	627	⁶ 643	⁵ 564	560
Finland ⁴	700	498	489	⁴ 458	480
Brazil	410	476	267	³ 340	340
Albania	1,109	¹ 1,200	910	⁸ 800	150
Philippines	¹ 129	217	¹ 186	¹ 184	132
Russia ²	—	—	—	—	³ 121
Iran	60	73	77	⁹ 90	100
U.S.S.R. ⁴	3,700	3,800	3,800	3,800	—
Total	¹ 12,586	¹ 13,945	¹ 12,729	¹ 13,211	10,694
Other	³ 310	³ 349	² 239	² 234	202
Grand total	¹ 12,896	¹ 14,294	¹ 12,968	¹ 13,445	10,896

¹Estimated. ²Revised.

³Table includes data through May 26, 1993.

⁴Formerly part of the U.S.S.R.

⁵Reported figure.

⁶Dissolved in Dec. 1991.

TABLE 27
LEADING WORLD PRODUCERS OF MINE COPPER¹

(Thousand metric tons, Cu content of ore)

Country	1988	1989	1990	1991	1992*
Chile	1,451	1,609	1,588	1,814	1,910
United States ²	1,420	1,498	1,588	1,631	1,765
Canada	777	723	794	811	764
Zambia	457	466	436	410	440
Poland	437	384	329	320	387
China ³	282	276	300	300	375
Russia ³	—	—	—	—	375
Peru	338	388	334	400	368
Kazakhstan ³	—	—	—	—	350
Australia	238	296	330	311	326
Mexico	285	264	321	325	320
Indonesia ²	122	144	164	212	281
Papua New Guinea	219	204	170	205	193
Zaire ²	496	466	373	251	171
South Africa, Republic of ²	169	182	179	185	167
Portugal ²	4	104	163	165	151
Philippines	218	193	182	148	123
Mongolia	122	124	124	90	105
U.S.S.R. ⁴	1,000	1,000	950	900	—
Total	8,035	8,321	8,325	8,478	8,571
Other	692	737	692	709	723
Grand total	8,727	9,058	9,017	9,187	9,294

*Estimated. ²Revised.

¹Data represent copper content by analysis of concentrates produced except where otherwise noted. Table includes data available through June 30, 1993.

²Recoverable content.

³Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁴Reported figure.

⁵Dissolved in Dec. 1991.

TABLE 28
LEADING WORLD PRODUCERS OF MINE GOLD¹

(Thousand metric tons, Cu content of ore)

Country	1988	1989	1990	1991	1992 ²
South Africa, Republic of	621,000	607,460	⁶ 605,100	601,013	⁶ 613,900
United States	200,914	265,731	² 294,189	² 296,805	³ 329,124
Australia	156,950	203,563	244,137	234,218	240,000
Canada	134,813	159,494	167,373	¹ 176,552	² 158,049
Russia ³	—	—	—	—	146,000
China ⁴	78,000	90,000	100,000	120,000	140,000
Papua New Guinea	38,129	27,538	³ 31,938	60,780	² 80,390
Uzbekistan ³	—	—	—	—	80,000
Brazil	¹ 112,159	¹ 102,849	⁸ 5,098	⁷ 5,844	76,000
Indonesia	4,738	6,155	11,158	16,879	² 37,983
Colombia	29,014	29,506	29,352	³ 4,844	37,000
Chile	20,614	22,559	27,503	² 8,668	33,300
Ghana	11,601	13,358	16,840	26,310	² 31,031
Kazakhstan ³	—	—	—	—	24,000
Philippines	30,482	29,992	24,591	24,938	24,000
Korea, Republic of	11,121	14,270	20,760	² 0,809	21,000
Zimbabwe	14,191	¹ 6,003	16,900	¹ 7,800	18,000
Ecuador	¹ 0,200	¹ 0,390	¹ 0,710	12,000	11,000
Mexico	9,098	8,613	8,338	8,937	10,000
U.S.S.R. ⁴	277,600	304,000	302,000	² 60,000	—
Total	¹ 1,760,624	¹ 1,911,481	¹ 1,995,987	² 0,016,397	2,110,777
Other	¹ 13,179	¹ 18,633	¹ 36,966	¹ 32,346	137,063
Grand total	¹ 1,873,803	² 0,030,114	² 1,132,953	² 1,148,743	2,247,840

⁶Estimated. ⁷Revised.

¹Table contains data available through July 19, 1993.

²Reported figure.

³Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁴Dissolved in Dec. 1991.

TABLE 29
LEADING WORLD PRODUCERS OF IRON ORE, IRON ORE CONCENTRATES, AND IRON ORE
AGGLOMERATES¹

(Thousand metric tons, gross weight)

Country	1988	1989	1990	1991	1992 ²
China ³	¹ 154,380	¹ 162,160	¹ 169,360	¹ 175,300	194,000
Brazil	146,008	157,900	¹ 152,300	¹ 151,500	146,000
Australia	⁹ 99,450	¹ 108,680	¹ 113,530	¹ 121,820	117,170
Russia ²	—	—	—	—	82,500
Ukraine ²	—	—	—	—	75,700
United States	57,515	59,032	56,408	56,596	³ 55,593
India	49,961	⁵ 53,418	54,579	57,638	54,000
Canada	39,934	39,445	35,670	³ 36,383	34,136
South Africa, Republic of	25,248	29,958	30,291	² 28,958	³ 28,226
Venezuela	18,932	18,390	20,365	21,222	22,000
Kazakhstan ²	—	—	—	—	20,000
Sweden	20,440	21,763	19,877	¹ 19,328	³ 19,280
Korea, North ³	9,000	9,500	9,500	10,000	10,500
Mauritania	¹ 10,004	¹ 12,110	¹ 11,590	¹ 10,246	10,300
Chile	7,710	8,761	8,248	8,414	8,500
Mexico	8,431	8,141	8,073	⁷ 7,539	7,380
France	9,872	9,319	8,729	7,472	5,700
Turkey	5,481	4,518	5,050	5,400	5,300
Iran	2,005	2,296	3,240	4,890	5,000
U.S.S.R. ⁴	249,754	241,348	236,000	¹ 199,000	—
Total	⁹ 14,125	⁹ 46,739	⁹ 42,810	⁹ 21,706	901,285
Other	⁵ 3,093	⁵ 1,912	³ 9,419	³ 4,518	28,469
Grand total	⁹ 67,218	⁹ 98,651	⁹ 82,229	⁹ 56,224	929,754

²Estimated. ³Revised.

¹Table includes data available through July 20, 1993.

²Formerly part of the U.S.S.R.; data were not reported separately until 1992.

³Reported figure.

⁴Dissolved in Dec. 1991.

TABLE 30
LEADING WORLD PRODUCERS OF CRUDE STEEL¹

(Thousand metric tons)

Country	1988	1989	1990	1991	1992 ^P
Japan	105,681	107,908	110,339	109,649	98,131
United States	90,650	88,852	89,726	79,738	84,322
China	59,430	61,200	66,100	70,570	*80,000
Russia ²	—	—	—	—	*67,000
Ukraine ²	—	—	—	—	*42,000
Germany	49,154	48,902	*43,981	42,169	39,768
Korea, Republic of	19,117	21,873	23,125	26,001	28,054
Italy	23,760	25,213	25,439	*25,046	24,904
Brazil	*24,657	*25,055	*20,567	22,617	*24,000
India	14,309	14,608	14,963	*17,100	*18,000
France	19,122	19,335	19,032	18,437	17,961
United Kingdom	19,013	18,813	17,908	16,511	16,050
Canada	14,866	15,458	12,281	12,987	13,924
Spain	11,685	12,684	12,705	*12,933	12,295
Czechoslovakia	15,319	15,465	14,877	12,133	*11,140
Taiwan	8,313	9,047	9,747	10,957	*11,000
Turkey	7,982	7,934	9,462	9,336	*10,343
Belgium	11,222	*10,952	*11,419	*11,334	10,276
Poland	16,873	15,094	13,625	10,439	*9,800
South Africa, Republic of	8,837	9,337	*8,619	9,358	9,061
Mexico	7,779	7,851	8,726	7,883	8,435
Korea, North ^o	8,000	8,000	8,000	8,000	*8,100
Australia	6,399	6,735	6,666	6,018	6,322
Netherlands	5,518	5,681	5,412	*5,171	5,438
Romania	14,496	14,415	9,787	*7,116	5,372
U.S.S.R. ³	163,037	160,096	154,414	132,666	—
Total	*725,219	*730,508	*716,920	*684,169	661,696
Other	*55,099	*56,204	*54,249	*51,838	59,619
Grand total	*780,318	*786,712	*771,169	*736,007	721,315

*Estimated. ^PPreliminary. ^RRevised.

¹Table includes data available through July 6, 1993.

²Formerly part of the U.S.S.R.; data were not reported separately until 1992.

³Dissolved in Dec. 1991.

TABLE 31
LEADING WORLD PRODUCERS OF MINE LEAD¹

(Thousand metric tons, Pb content of ore)

Country	1988	1989	1990	1991	1992 ^P
Australia	466	495	565	571	548
United States	394	420	497	477	408
China ^a	312	308	364	380	^a 385
Canada	368	275	232	² 235	342
Kazakhstan ²	—	—	—	—	² 240
Peru	149	192	¹ 188	² 200	193
Mexico	171	163	180	¹ 165	¹ 174
Sweden	92	89	⁹ 98	⁹ 91	106
South Africa, Republic of	90	78	69	76	75
Korea, North ^a	90	⁸ 80	⁸ 80	⁸ 80	⁷ 75
U.S.S.R. ³	440	440	420	³ 380	—
Total ⁴	² 2,572	² 2,541	² 2,693	² 2,655	2,547
Other	⁷ 753	⁷ 704	⁶ 660	⁶ 621	695
Grand total	³ 3,325	¹ ³ 3,244	³ 3,353	³ 3,276	3,242

^aEstimated. ^PPreliminary. ^RRevised.

¹Table includes data available through July 6, 1993.

²Formerly part of the U.S.S.R.; data were not reported separately until 1992.

³Dissolved in Dec. 1991.

⁴Data do not add to total shown because of independent rounding.

TABLE 32
LEADING WORLD PRODUCERS OF MANGANESE ORE¹

(Thousand metric tons gross weight)

Country	1988	1989	1990	1991	1992 ^a
Ukraine ²	—	—	—	—	5,800
China	3,212	3,331	³ 3,300	³ 3,400	3,500
South Africa, Republic of	4,023	4,884	4,402	³ 3,146	² 2,464
Brazil	1,991	¹ 1,904	² 2,300	² 2,000	1,800
Gabon	2,254	2,592	2,423	¹ 1,620	³ 1,556
India	1,333	1,334	¹ 1,393	¹ 1,401	1,400
Australia	1,985	2,124	1,920	1,482	1,200
Georgia ²	—	—	—	—	1,200
Mexico	444	394	365	² 254	³ 407
Ghana	260	279	247	³ 320	² 279
Morocco	30	32	49	59	59
Iran	75	81	54	⁴ 48	50
Romania	65	60	55	50	45
U.S.S.R. ⁴	9,108	9,141	8,500	⁷ 7,240	—
Total	² 24,780	² 26,156	² 25,008	² 21,020	19,760
Other	² 234	² 232	² 244	¹ 192	169
Grand total ⁵	² 25,013	² 26,389	² 25,252	² 21,213	19,929

^aEstimated. ^RRevised.

¹Table includes data available through July 12, 1993.

²Formerly part of the U.S.S.R.; data were not reported separately until 1992.

³Reported figure.

⁴Dissolved in Dec. 1991.

⁵Data may not add to totals shown because of independent rounding.

TABLE 33
LEADING WORLD PRODUCERS OF MINE NICKEL¹

(Thousand metric tons, Ni content)

Country	1988	1989	1990	1991	1992 ²
Russia ²	—	—	—	—	² 15
Canada	² 217	201	¹ 196	¹ 192	192
New Caledonia ³	¹ 71	¹ 96	¹ 85	¹ 114	113
Indonesia	58	63	68	¹ 72	78
Australia	62	67	67	69	64
China ⁴	¹ 33	¹ 34	¹ 33	¹ 31	37
Cuba	¹ 44	¹ 46	¹ 41	¹ 33	32
South Africa, Republic of	¹ 30	¹ 29	¹ 29	¹ 28	28
Dominican Republic	29	31	² 29	² 29	² 25
U.S.S.R. ⁵	280	280	² 280	² 245	—
Total ⁴	¹ 824	¹ 848	¹ 828	¹ 814	785
Other	¹ 128	¹ 136	¹ 137	¹ 135	137
Grand total	¹ 952	¹ 984	¹ 965	¹ 949	922

¹Estimated. ²Preliminary. ³Revised.

⁴Table includes data available through Aug. 18, 1993.

⁵Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁶Dissolved in Dec. 1991.

⁷Data may not add to totals shown because of independent rounding.

TABLE 34
LEADING WORLD PRODUCERS OF MINE SILVER¹

(Metric tons, Ag content)

Country	1988	1989	1990	1991	1992 ²
Mexico	2,359	2,306	2,346	² 2,224	2,316
United States	1,661	² 2,008	² 2,121	¹ 1,855	² 1,804
Peru	1,552	¹ 1,840	¹ 1,762	1,770	1,570
Australia	1,118	1,075	1,138	1,180	² 1,245
Canada (shipments)	1,443	1,262	1,400	¹ 1,339	1,207
Chile	507	545	655	¹ 674	1,000
Kazakhstan ³	—	—	—	—	900
Poland	1,063	1,003	832	⁸ 70	850
Russia ³	—	—	—	—	800
Spain	² 353	530	500	⁴ 00	400
Morocco	226	237	241	² 96	² 295
Bolivia	232	267	311	³ 76	260
Korea, Republic of (refinery)	227	239	238	² 65	250
Sweden	208	228	243	² 39	240
U.S.S.R. ⁴ (refinery)	² 500	² 500	² 500	² 200	200
Brazil	124	172	223	¹ 94	194
South Africa, Republic of	200	180	¹ 61	¹ 71	² 172
China ⁵	110	125	125	150	170
Japan	252	156	150	171	170
Italy (refinery)	92	96	103	¹ 76	160
Papua New Guinea	70	94	¹ 06	125	130
Serbia and Montenegro ⁶	—	—	—	—	100
Total	¹ 14,297	¹ 14,863	¹ 15,155	¹ 14,675	14,433
Other	¹ 1,187	¹ 1,178	¹ 1,061	¹ 1,017	912
Grand total	¹ 15,484	¹ 16,041	¹ 16,216	¹ 15,692	15,345

¹Estimated. ²Revised.

³Recoverable content of ores and concentrates produced unless otherwise specified. Table includes data available through June 23, 1993.

⁴Reported figure.

⁵Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁶Dissolved in Dec. 1991; however, information is inadequate to formulate reliable estimates for individual countries other than those listed in this table.

⁷Formerly part of Yugoslavia; data were not reported separately until 1992.

TABLE 35
LEADING WORLD PRODUCERS OF MINE TIN¹

(Metric tons, Sn content of ore)

Country	1988	1989	1990	1991	1992 [*]
China [*]	29,500	40,000	42,000	43,000	43,000
Brazil	44,102	50,232	39,149	¹ 29,253	30,000
Indonesia	29,590	31,263	30,200	30,061	25,000
Bolivia	10,504	15,849	17,249	¹ 16,830	15,300
Thailand	14,225	14,922	14,635	14,937	15,000
Malaysia	28,866	32,034	28,468	20,710	² 14,339
Russia ^{* 3}	—	—	—	—	10,000
Portugal	81	63	⁴ 4,779	³ 8,333	6,500
Australia	7,009	7,709	⁷ 7,377	⁵ 5,700	² 6,400
Peru	4,181	⁵ 5,082	5,134	6,559	6,000
Zaire	2,771	2,346	2,221	¹ 1,635	1,500
Zimbabwe [*]	1,140	¹ 1,130	¹ 1,120	¹ 1,060	1,060
United Kingdom	3,454	3,846	3,400	² 3,326	1,000
U.S.S.R. ^{* 4}	16,000	16,000	15,000	13,500	—
Total	¹ 191,423	² 220,476	² 210,732	¹ 193,904	175,099
Other	¹ 13,231	¹ 12,651	¹ 10,919	³ 8,819	4,367
Grand total	² 204,654	² 233,127	² 221,651	² 202,723	179,466

^{*}Estimated. ¹Revised.

¹Table includes data available through July 26, 1993.

²Reported figure.

³Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁴Dissolved in Dec. 1991.

TABLE 36
LEADING WORLD PRODUCERS OF MINE URANIUM¹

(Metric tons, U₃O₈ content)

Country	1988	1989	1990	1991	1992 [*]
Canada	14,695	13,475	10,342	⁹ 9,624	² 10,869
Australia	³ 3,531	³ 3,656	³ 3,529	³ 3,776	3,500
Kazakhstan ³	—	—	—	—	3,000
Niger	³ 3,482	3,013	3,161	³ 3,330	² 2,970
United States	5,956	6,276	⁴ 4,030	³ 3,607	2,561
South Africa, Republic of	4,583	3,456	2,875	² 2,039	² 2,222
France	³ 3,385	³ 3,219	² 2,820	¹ 2,300	2,000
Nambia	⁴ 2,263	³ 3,809	³ 3,719	2,889	² 1,986
Czechoslovakia	² 2,300	2,300	1,900	¹ 1,900	1,900
Gabon	1,094	1,047	828	¹ 700	700
Total	⁴ 3,289	⁴ 40,251	³ 33,204	³ 30,165	31,708
Others	¹ 1,333	¹ 1,170	¹ 1,112	¹ 1,110	1,084
Grand total	⁴ 44,622	⁴ 41,421	³ 34,316	³ 31,275	32,792

^{*}Estimated. ¹Revised.

¹Table includes data available through Nov. 30, 1993.

²Reported figure.

³Formerly part of the U.S.S.R.

TABLE 37
LEADING WORLD PRODUCERS OF MINE ZINC¹

(Thousand metric tons, Zn content of ore)

Country	1988	1989	1990	1991	1992 ²
Canada	1,370	1,216	1,203	¹ 1,157	1,312
Australia	759	803	⁹ 937	1,048	1,028
China ³	528	538	619	650	670
Peru	485	597	⁵ 584	⁶ 628	601
United States	256	288	543	547	552
Mexico	262	284	322	301	279
Spain	² 282	² 267	² 258	² 261	202
Kazakhstan ²	—	—	—	—	² 200
Korea, North ³	225	230	230	200	200
Ireland	173	169	¹ 167	188	194
Sweden	² 200	174	¹ 164	¹ 161	170
Poland	¹ 184	179	178	¹ 144	151
Russia ²	—	—	—	—	¹ 150
India	61	65	74	102	¹ 148
Bolivia	57	75	104	¹ 130	144
Brazil	156	178	¹ 158	¹ 130	¹ 140
Japan	147	132	127	133	135
U.S.S.R. ³	⁶ 600	⁵ 550	⁵ 550	⁴ 475	—
Total	5,745	5,745	6,218	6,255	6,276
Other	1,028	1,063	966	916	862
Grand total ⁴	⁶ 6,774	⁶ 6,808	⁷ 7,184	⁷ 7,170	7,137

⁴Estimated. ⁵Preliminary. ⁶Revised.

¹Table includes data available through July 13, 1993.

²Formerly part of the U.S.S.R.; data were not reported separately until 1992.

³Dissolved in Dec. 1991.

⁴Data may not add to totals shown because of independent rounding.

TABLE 38
LEADING WORLD PRODUCERS OF HYDRAULIC CEMENT¹

(Thousand metric tons)

Country	1988	1989	1990	1991	1992*
China ²	210,000	207,000	203,000	248,000	304,000
Japan	77,554	79,717	84,445	³ 89,560	² 90,700
United States (including Puerto Rico)	70,989	71,268	¹ 71,407	66,753	² 71,426
Russia ³	—	—	—	—	68,000
India	40,700	46,000	49,000	¹ 51,000	50,000
Korea, Republic of	28,995	30,474	33,600	³ 38,335	42,600
Italy	37,884	39,385	¹ 40,544	40,717	² 41,347
Germany	38,731	40,763	37,684	³ 34,396	37,500
Turkey	22,675	¹ 23,796	¹ 24,416	¹ 26,026	² 28,607
Brazil	² 25,330	¹ 25,926	¹ 25,848	¹ 27,490	² 28,100
Mexico	22,513	22,766	¹ 23,824	¹ 25,100	26,900
Spain (including Canary Islands)	² 25,000	27,374	28,092	27,581	26,000
France	25,300	26,835	26,388	¹ 26,507	21,600
Taiwan	17,281	18,043	18,459	19,389	20,700
Ukraine ³	—	—	—	—	20,000
Iran ²	² 12,202	12,500	13,000	15,000	18,000
Thailand	11,514	15,024	18,054	¹ 18,054	18,000
Indonesia	¹ 12,242	14,099	13,762	16,153	² 17,280
Korea, North ²	12,000	16,000	16,000	16,000	17,000
Egypt	9,787	¹ 12,480	¹ 14,111	¹ 16,427	16,000
Saudi Arabia	10,951	11,442	¹ 12,000	¹ 13,000	15,000
Greece	13,053	12,535	¹ 13,561	¹ 13,580	13,100
Poland	16,984	17,125	12,600	¹ 12,031	12,000
United Kingdom	16,506	16,849	14,000	¹ ¹ 11,662	10,720
Iraq ²	² 10,500	12,500	10,000	5,000	10,000
Malaysia	3,775	4,794	5,881	¹ 7,451	9,525
Romania	¹ 14,447	¹ 13,265	¹ 10,383	¹ ¹ 10,000	9,000
U.S.S.R. ⁴	139,499	140,436	137,322	¹ 127,000	—
Total	¹ 926,412	¹ 958,396	¹ 957,381	¹ 1,002,212	1,043,105
Other	¹ 192,068	¹ 189,906	¹ 190,692	¹ 187,545	209,396
Grand total ⁵	¹ 1,118,480	¹ 1,148,302	¹ 1,148,073	¹ 1,189,757	1,252,501

*Estimated. ¹Revised.

¹Table includes data available through June 9, 1993.

²Reported figure.

³Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁴Dissolved in Dec. 1991.

⁵Data may not add to totals shown because of independent rounding.

TABLE 39
LEADING WORLD PRODUCERS OF NATURAL DIAMOND¹

(Thousand carats)

Country	1988	1989	1990	1991	1992*
Australia	34,826	35,080	34,662	35,956	42,000
Russia ^{2 3}	—	—	—	—	18,000
Botswana	15,229	15,252	17,352	¹ 16,506	15,000
Zaire	18,163	17,755	19,427	¹ 17,814	15,000
South Africa, Republic of	8,504	9,116	8,708	¹ 8,431	10,156
Namibia	¹ 975	927	¹ 763	¹ 1,187	¹ 1,549
Brazil	¹ 530	500	1,500	¹ 1,500	1,500
Angola ⁴	1,000	¹ 1,245	¹ 1,133	⁴ 961	1,000
China ⁴	1,000	1,000	1,000	1,000	1,000
Ghana	¹ 520	¹ 494	¹ 650	¹ 700	700
U.S.S.R. ^{4 5}	¹ 22,000	¹ 23,000	¹ 24,000	¹ 20,000	—
Total	¹ 102,747	¹ 104,369	¹ 109,195	¹ 104,055	105,905
Other	¹ 1,584	¹ 1,873	¹ 1,724	¹ 1,800	1,866
Grand total	¹ 104,331	¹ 106,242	¹ 110,919	¹ 105,855	107,771

¹Estimated. ²Revised.

³Table includes data available through May 25, 1993.

⁴Formerly part of the U.S.S.R.

⁵All production in the U.S.S.R. from 1988-91 came from Russia.

⁶Reported figure.

⁷Dissolved in Dec. 1991.

TABLE 40
LEADING WORLD PRODUCERS OF NITROGEN IN AMMONIA¹

(Thousand metric tons, N content)

Country	1988	1989	1990	1991	1992 ²
China ³	16,500	17,000	17,500	18,000	18,000
United States	12,544	12,280	¹ 12,680	¹ 12,801	² 13,404
Russia ³	—	—	—	—	² 8,786
India ⁴	6,205	6,661	7,022	7,044	7,000
Ukraine ³	—	—	—	—	² 3,882
Canada	3,289	3,339	3,054	3,016	² 3,104
Indonesia	2,367	2,526	² 2,600	² 2,706	2,700
Netherlands	² 2,695	² 2,901	³ 3,188	³ 3,033	² 2,667
Mexico	2,067	2,100	2,164	² 2,221	2,222
Germany	2,980	2,882	² 2,371	² 2,123	2,160
Japan	1,524	1,539	1,531	1,553	² 1,602
Trinidad and Tobago	¹ 1,388	¹ 1,550	1,520	¹ 1,524	² 1,568
Poland	2,338	2,360	2,006	1,669	1,500
France	1,832	1,476	1,586	¹ 1,604	² 1,407
Uzbekistan ³	—	—	—	—	² 1,309
Bulgaria	1,342	¹ 1,300	1,309	1,300	1,300
Pakistan ³	1,173	1,175	1,180	1,185	1,187
Romania	² 2,795	² 2,736	¹ 1,785	1,130	1,100
Italy	1,561	1,446	1,197	¹ 1,147	² 1,098
Belarus ³	—	—	—	—	² 916
Saudi Arabia	867	863	942	827	² 904
Brazil	935	979	938	793	² 877
United Kingdom	1,105	1,037	1,148	¹ 1,011	² 869
U.S.S.R. ³	20,200	19,400	18,200	17,100	—
Total ⁶	¹ 85,708	¹ 85,551	¹ 83,921	¹ 81,788	79,562
Other	¹ 13,557	¹ 13,680	¹ 13,190	¹ 12,207	12,968
Grand total ⁶	¹ 99,265	¹ 99,234	¹ 97,110	¹ 93,995	92,532

¹Estimated. ²Revised.

³Table includes data available through May 25, 1993.

⁴Reported figure.

⁵Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁶Data are for years beginning Apr. 1 of that stated.

⁷Dissolved in Dec. 1991.

⁸Data may not add to totals shown because of independent rounding.

TABLE 41
LEADING WORLD PRODUCERS OF PHOSPHATE ROCK¹

(Thousand metric tons, gross weight)

Country	1988	1989	1990	1991	1992*
United States	45,389	49,817	46,343	48,096	² 46,965
China ^o	17,000	² 20,000	² 21,550	² 22,000	23,000
Morocco ³	25,015	18,067	21,396	17,900	² 19,184
Russia ⁴	—	—	—	—	14,000
Kazakhstan ⁴	—	—	—	—	7,000
Tunisia	6,103	6,610	⁶ 6,258	⁶ 6,400	6,400
Jordan	6,611	6,900	⁶ 6,082	⁴ 4,433	² 4,296
Israel	3,479	3,922	3,516	³ 3,370	³ 3,595
Brazil	4,672	3,655	2,968	³ 2,280	3,300
South Africa, Republic of	2,850	2,963	3,165	3,050	³ 3,051
Senegal	2,326	2,273	2,147	1,741	2,300
Togo	3,464	3,355	2,314	2,965	² 2,083
U.S.S.R. ^{o 5}	³ 37,000	³ 37,500	³ 36,800	² 28,400	—
Total	¹ 153,909	¹ 155,062	¹ 152,539	¹ 141,635	135,174
Other	² 10,966	² 10,686	² 8,989	² 8,030	8,579
Grand total	¹ 164,875	¹ 165,748	¹ 161,528	¹ 149,665	143,753

*Estimated. ²Revised.

¹Data for major phosphate rock-producing countries derived in part from the International Fertilizer Association; other figures are from official country sources where available. Table includes data available through May 10, 1993.

²Reported figure.

³Production from Western Sahara area is included.

⁴Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁵Dissolved in Dec. 1991.

TABLE 42
LEADING WORLD PRODUCERS OF MARKETABLE POTASH¹

(Thousand metric tons, K₂O equivalent)

Country	1988	1989	1990	1991	1992*
Canada	8,154	7,014	7,345	⁷ 7,406	² 7,327
Belarus ³	—	—	—	—	3,600
Russia ³	—	—	—	—	3,500
Germany	5,800	⁵ 5,381	⁴ 4,869	³ 3,902	³ 3,470
United States	1,521	1,595	1,713	1,749	² 1,705
Israel	1,244	1,273	1,311	¹ 1,320	1,300
France	1,502	1,195	¹ 1,292	1,129	1,130
U.S.S.R. ⁴	11,301	10,200	9,000	¹ 8,560	—
Total ⁵	² 29,523	² 26,658	² 25,530	² 24,066	22,032
Other	² 2,297	² 2,257	² 2,242	² 2,028	2,295
Grand total ⁵	³ 31,820	² 28,916	² 27,772	² 26,094	24,327

*Estimated. ²Revised.

¹Table includes data available through Apr. 26, 1993.

²Reported figure.

³Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁴Dissolved in Dec. 1991.

⁵Data may not add to totals shown because of independent rounding.

TABLE 43
LEADING WORLD PRODUCERS OF SALT¹

Thousand metric tons)

Country	1988	1989	1990	1991	1992 ²
United States (including Puerto Rico) ³	34,361	35,292	36,959	35,943	² 34,830
China ⁴	22,000	28,000	20,000	² 24,100	25,000
Germany ⁵	¹ 17,861	¹ 17,161	¹ 16,043	¹ 16,025	13,125
Canada	10,687	11,057	11,097	¹ 11,993	11,154
India	9,204	9,603	9,503	9,503	9,503
Brazil	4,356	3,653	⁵ 5,203	⁸ 8,213	8,200
Australia	7,165	7,069	7,227	7,791	8,000
Mexico	6,788	6,942	7,135	7,595	7,600
France ⁶	7,570	⁷ 7,464	6,450	6,500	6,600
United Kingdom	6,130	6,756	6,434	⁶ 6,828	6,600
Romania ⁶	5,400	² 6,771	6,500	6,500	6,000
Ukraine ³	—	—	—	—	4,400
Italy	4,289	3,951	³ 3,702	⁴ 4,000	4,100
Poland	6,179	4,670	4,055	³ 3,900	3,900
Russia ³	—	—	—	—	² 3,600
Netherlands	3,693	3,756	3,653	³ 3,417	3,500
Spain	³ 3,880	³ 3,090	³ 3,377	³ 3,400	3,400
U.S.S.R. ⁴	14,800	15,000	14,700	¹ 14,000	3,000
Chile	1,043	904	1,834	¹ 1,676	1,700
Turkey	¹ 1,358	1,739	¹ 1,600	¹ 1,440	1,500
Japan	1,363	1,367	1,377	¹ 1,380	1,370
Argentina	1,247	1,186	¹ 1,201	¹ 1,201	1,101
Israel	361	475	426	¹ 1,115	1,100
Bahamas, The	616	858	⁸ 828	¹ 1,096	1,000
Total	¹ 170,351	¹ 176,764	¹ 169,304	¹ 177,616	170,283
Other	¹ 15,188	¹ 15,707	¹ 14,759	¹ 14,664	14,571
Grand total ⁵	¹ 185,542	¹ 192,473	¹ 184,062	¹ 192,281	184,854

⁶Estimated. ⁷Revised.

¹Table includes data available through July 19, 1993.

²Reported figure.

³Formerly part of the U.S.S.R.

⁴Dissolved in Dec. 1991. In addition to the former republics of the U.S.S.R. listed in this table, it is believed that Armenia, Azerbaijan, and Turkmenistan also produce; however, information is inadequate to formulate reliable estimates of individual country production.

⁵Data may not add to totals shown because of independent rounding.

TABLE 44
LEADING WORLD PRODUCERS OF ELEMENTAL SULFUR¹

(Thousand metric tons)

Country	1988				1989			
	Native	From pyrites	Byproducts	Total	Native	From pyrites	Byproducts	Total
United States ²	3,174	W	7,572	10,746	3,888	W	7,704	11,592
U.S.S.R. ³	3,500	2,150	5,115	10,765	3,450	2,150	4,300	9,900
Canada ⁴	—	—	6,908	6,908	—	—	6,632	6,632
China ⁵	300	3,900	550	4,750	300	4,270	600	5,170
Poland ⁶	5,000	—	200	5,200	4,864	—	190	5,054
Japan	—	71	2,361	2,432	—	62	⁷ 2,497	2,559
Saudi Arabia	—	—	1,378	1,378	—	—	1,423	1,423
Mexico ²	¹ 1,628	—	750	2,378	¹ 1,528	—	841	2,369
Germany ⁸	—	—	² 1,153	² 1,153	—	—	² 1,136	² 1,136
France ⁹	—	—	1,181	1,181	—	—	1,036	1,036
Spain ¹⁰	—	⁴ 1,057	120	1,177	—	⁴ 938	120	1,058
Iran ¹¹	—	—	231	231	—	—	500	500
Finland ¹²	—	313	287	600	—	306	221	527
South Africa, Republic of ¹³	—	⁴ 507	¹ 230	738	—	461	¹ 220	¹ 682
Iraq ¹⁴	⁴ 958	—	⁴ 227	⁴ 1,185	960	—	370	1,330
Italy ¹⁵	—	308	310	618	—	323	315	638
Romania ¹⁶	—	370	380	750	—	359	375	734
Chile	38	—	416	454	16	—	⁴ 400	⁴ 416
Belgium ¹⁷	—	—	310	310	—	—	320	320
Philippines ¹⁸	—	160	150	310	—	195	185	380
Netherlands ¹⁹	—	—	215	215	—	—	260	260
Brazil	6	103	213	322	6	72	224	302
India ²⁰	—	³ 30	135	165	—	³ 39	129	168
Korea, North ²¹	—	200	30	230	—	200	30	230
Norway ²²	—	¹ 152	90	242	—	¹ 122	88	210
Australia ²³	—	—	209	209	—	—	210	210
Total ⁵	¹ 14,604	⁹ 3,321	³ 31,722	⁵ 55,647	¹ 15,012	⁹ 4,497	³ 31,327	⁵ 55,836
Other	⁹ 96	¹ 1,128	² 2,289	³ 3,513	⁹ 90	¹ 1,070	² 2,302	³ 3,462
Grand total	¹ 14,700	¹⁰ 4,449	³⁴ 34,011	⁵⁹ 59,160	¹ 15,102	¹⁰ 5,567	³³ 33,629	⁵⁹ 59,298

Country	1990				1991			
	Native	From pyrites	Byproducts	Total	Native	From pyrites	Byproducts	Total
United States ²	3,726	W	7,834	11,560	2,869	W	⁷ 7,951	¹⁰ 10,820
U.S.S.R. ³	3,000	1,900	4,125	9,025	2,700	1,700	3,700	8,100
Canada ⁴	—	—	⁶ 6,710	⁶ 6,710	—	—	⁷ 7,102	⁷ 7,102
China ⁵	320	4,400	650	5,370	320	⁴ 4,700	650	⁵ 5,670
Poland ⁶	4,664	—	170	4,834	³ 3,935	—	170	⁴ 4,105
Japan	—	53	2,604	2,657	—	¹ 30	¹ 2,650	¹ 2,680
Saudi Arabia	—	—	1,435	1,435	—	—	² 2,000	² 2,000
Mexico ²	⁴ 1,441	—	991	2,432	¹ 1,040	—	¹ 1,034	² 2,074
Germany ⁸	—	—	² 2,050	² 2,050	—	—	¹ 1,744	¹ 1,744
France ⁹	—	—	1,049	1,049	—	—	1,199	1,199
Spain ¹⁰	—	⁴ 748	110	858	—	800	110	910
Iran ¹¹	—	—	680	680	—	—	700	700
Finland ¹²	—	³ 357	279	636	—	369	267	636
South Africa, Republic of ¹³	—	452	¹ 231	683	—	293	² 224	517

See footnotes at end of table.

TABLE 44—Continued
LEADING WORLD PRODUCERS OF ELEMENTAL SULFUR¹

(Thousand metric tons)

Country	1990				1991			
	Native	From pyrites	Byproducts	Total	Native	From pyrites	Byproducts	Total
Iraq [*]	800	—	'380	'1,180	'250	—	'50	'300
Italy [*]	—	290	297	587	—	285	315	600
Romania [*]	—	300	350	650	—	300	350	650
Chile	28	—	'400	'428	'20	—	'400	'420
Belgium [*]	—	—	310	310	—	—	300	300
Philippines [*]	—	134	'185	319	—	150	150	300
Netherlands [*]	—	—	285	285	—	—	290	290
Brazil	6	46	224	276	'6	'50	'226	'282
India [*]	—	'94	135	229	—	'128	142	270
Korea, North [*]	—	200	30	230	—	210	30	240
Norway [*]	—	125	90	215	—	121	90	211
Australia [*]	—	—	210	210	—	—	210	210
Total ²	'13,985	'9,099	'31,814	'54,898	'11,140	'9,136	'32,054	'52,330
Other	'68	'932	'2,184	'3,184	'85	'745	'1,881	'2,711
Grand total	'14,053	'10,031	'33,998	'58,082	'11,225	'9,881	'33,935	'55,041

Country	1992 [*]			
	Native	From pyrites	Byproducts	Total
United States ²	2,320	W	8,343	10,663
U.S.S.R. ³	2,400	1,400	3,450	7,250
Canada [*]	—	—	7,246	7,246
China [*]	320	5,000	650	5,970
Poland [*]	2,900	—	160	3,060
Japan	—	35	2,600	2,635
Saudi Arabia	—	—	2,000	2,000
Mexico ²	820	—	780	1,600
Germany [*]	—	—	1,415	1,415
France [*]	—	—	1,155	1,155
Spain [*]	—	800	110	910
Iran [*]	—	—	750	750
Finland [*]	—	370	265	635
South Africa, Republic of ²	—	'384	220	'604
Iraq [*]	500	—	70	570
Italy [*]	—	200	280	480
Romania [*]	—	200	250	450
Chile	22	—	400	422
Belgium [*]	—	—	300	300
Netherlands [*]	—	—	290	290
Brazil	6	50	226	282
India [*]	—	100	143	243
Korea, North [*]	—	210	30	240
Norway [*]	—	125	90	215

See footnotes at end of table.

TABLE 44—Continued
LEADING WORLD PRODUCERS OF ELEMENTAL SULFUR¹

(Thousand metric tons)

Country	1992 ^a			Total
	Native	From pyrites	Byproducts	
Australia ^a	—	—	210	210
Total ⁵	9,288	9,024	31,583	49,895
Other	85	518	1,911	2,514
Grand total	9,373	9,542	33,494	52,409

^aEstimated. ^bRevised. W Withheld to avoid disclosing company proprietary data; included with "byproduct."

¹Sources listed include the following: (1) Frasch recovery; (2) native, comprising all production of elemental sulfur by traditional mining methods (thereby excluding Frasch); (3) pyrites (whether or not the sulfur is recovered in the elemental form or as acid); (4) byproduct recovery, either as elemental sulfur or as sulfur compounds from coal gasification, metallurgical operations including associated coal processing, crude oil and natural gas extraction, petroleum refining, tar sand cleaning, and processing of spent oxide from stack-gas scrubbers; and (5) recovery from the processing of mined gypsum. Recovery of sulfur in the form of sulfuric acid from artificial gypsum produced as a byproduct of phosphatic fertilizer production is excluded because to include it would result in double counting. It should be noted that production of Frasch sulfur, other native sulfur, pyrites-derived sulfur, mined gypsum-derived sulfur, byproduct sulfur from extraction of crude oil and natural gas, and recovery from tar sands are all credited to the country of origin of the extracted raw material; in contrast, byproduct recovery from metallurgical operations, petroleum refineries, and spent oxides are credited to the nation where the recovery takes place, which in some instances is not the original source country of the crude product from which the sulfur is extracted. Table includes data available through July 26, 1993.

²Native is entirely native Frasch process sulfur.

³Dissolved in Dec. 1991. This commodity is believed to be produced in Azerbaijan, Belarus, Estonia, Kazakhstan, Russia, Turkmenistan, Ukraine, and Uzbekistan; however information is inadequate to formulate reliable estimates of individual country production.

⁴Reported figure.

⁵Data may not add to totals shown due to independent rounding.

TABLE 45
LEADING WORLD PRODUCERS OF COAL (ALL GRADES)¹

(Million metric tons)

Country	1988			1989		
	Lignite and brown	Bituminous and anthracite	Total	Lignite and brown	Bituminous and anthracite	Total
China ^{a 2}	NA	945	945	NA	1,040	1,040
United States	77	782	859	78	808	886
Russia ^{a 3}	—	—	—	—	—	—
Germany	419	73	492	411	71	482
Australia	43	177	220	48	190	238
India	13	195	208	13	201	214
Poland	73	193	266	72	178	250
South Africa, Republic of	—	181	181	—	176	176
Ukraine ^{a 3}	—	—	—	—	—	—
Kazakhstan ^{a 3}	—	—	—	—	—	—
Czechoslovakia	100	26	126	94	25	119
North Korea ^a	18	62	80	20	65	85
United Kingdom	(⁴)	104	104	(⁴)	103	103
Canada	12	58	70	11	60	71
Turkey	39	7	46	53	6	59
Greece	48	—	48	50	—	50
Romania	51	12	63	55	12	67
Spain	13	19	32	17	19	36
Chile	—	2	2	—	2	2
U.S.S.R. ⁵	172	599	771	164	577	741
Total	1,078	3,435	4,513	1,086	3,533	4,619
Other	144	111	255	145	113	258
Grand total	1,222	3,546	4,768	1,231	3,646	4,877

See footnotes at end of table.

TABLE 45—Continued
LEADING WORLD PRODUCERS OF COAL (ALL GRADES)¹

(Million metric tons)

Country	1990			1991		
	Lignite and brown	Bituminous and anthracite	Total	Lignite and brown	Bituminous and anthracite	Total
China ²	NA	1,053	1,053	NA	1,090	1,090
United States	80	851	931	78	823	901
Russia ³	—	—	—	—	—	—
Germany	357	70	427	279	66	345
Australia	48	199	247	50	207	257
India	14	212	226	16	229	245
Poland	68	148	216	69	140	209
South Africa, Republic of	—	175	175	—	178	178
Ukraine ³	—	—	—	—	—	—
Kazakhstan ³	—	—	—	—	—	—
Czechoslovakia	85	22	107	83	19	102
North Korea ⁴	22	68	90	20	70	90
United Kingdom	(⁵)	96	96	(⁵)	96	96
Canada	9	59	68	9	62	71
Turkey	47	6	53	50	5	55
Greece	50	—	50	51	—	51
Romania	35	6	41	35	6	41
Spain	21	15	36	21	19	40
Chile	—	3	3	—	3	3
U.S.S.R. ⁵	160	543	703	180	449	629
Total	996	3,526	4,522	941	3,462	4,403
Other	143	84	227	133	103	236
Grand total ⁶	1,139	3,610	4,749	1,074	3,565	4,640

Country	1992 ⁶		
	Lignite and brown	Bituminous and anthracite	Total
China ²	NA	1,110	1,110
United States	82	821	903
Russia ³	60	275	335
Germany	242	66	308
Australia	50	205	255
India	15	210	225
Poland	67	132	199
South Africa, Republic of	—	174	174
Ukraine ³	7	127	134
Kazakhstan ³	—	127	127
Czechoslovakia	82	19	101
North Korea ⁴	21	70	91
United Kingdom	(⁵)	87	87
Canada	10	55	65
Turkey	50	5	55
Greece	54	—	54
Romania	35	5	40
Spain	19	15	34

See footnotes at end of table.

TABLE 45—Continued
LEADING WORLD PRODUCERS OF COAL (ALL GRADES)¹

(Million metric tons)

Country	1992 ^o		Total
	Lignite and brown	Bituminous and anthracite	
Chile	—	⁷ 32	⁷ 32
U.S.S.R. ⁵	—	—	—
Total	794	3,535	4,329
Other	117	121	238
Grand total ⁶	911	3,656	4,568

^oEstimated. ^rRevised.

¹Table includes data available through Jan. 16, 1994.

²Production of lignite and brown, if any, is included in the figures for bituminous coal production.

³Formerly part of the U.S.S.R.; data were not reported separately until 1992.

⁴Less than 1/2 unit.

⁵Dissolved in Dec. 1991.

⁶Data may not add to totals shown because of independent rounding.

⁷Reported figure.

TABLE 46
LEADING WORLD PRODUCERS OF MARKETED NATURAL GAS¹

(Billion cubic meters)

Country	1988	1989	1990	1991	1992 ²
Russia ²	—	—	—	—	640
United States	484	490	⁵ 504	⁵ 501	³ 505
Canada	88	93	99	105	³ 119
Netherlands	66	72	72	⁸ 82	³ 82
Turkmenistan ²	—	—	—	—	68
Algeria	45	48	49	⁵ 55	56
United Kingdom	42	41	⁴ 46	55	50
Indonesia	³ 37	40	⁴ 42	⁴ 40	45
Uzbekistan ²	—	—	—	—	43
Venezuela	¹ 13	¹ 14	16	25	³ 40
Mexico	35	30	34	34	³ 33
Saudi Arabia	29	30	31	32	33
Israel ³	45	44	40	32	32
Iran	20	22	24	² 29	³ 32
Chile	2	2	2	2	32
Norway	² 28	29	25	⁴ 25	³ 28
United Arab Emirates	19	23	24	² 25	26
Australia	15	18	21	22	22
Ukraine ²	—	—	—	—	21
Romania ³	29	30	21	23	³ 20
Germany	² 24	² 22	² 21	20	³ 19
Argentina	18	19	18	18	18
Italy	17	17	17	¹ 17	18
Malaysia	13	14	14	16	³ 18
China ³	13	13	13	13	14
Pakistan ³	12	12	12	13	13
Kazakhstan ²	—	—	—	—	9
Brunei	8	8	9	⁴ 9	9
Egypt ³	8	9	9	9	8
U.S.S.R. ⁴	770	796	815	810	—
Total	¹ 1,880	¹ 1,936	¹ 1,978	² 2,012	2,053
Other	⁹ 97	¹ 132	¹ 100	⁹ 99	103
Grand total	¹ 1,977	² 2,068	² 2,078	² 2,111	2,156

²Estimated. ³Revised.

¹This is not gross production. Marketed production is defined as gross production less these amounts: flared, vented to the atmosphere without flaring, used extensively to drive turbines and then flared or vented, and/or reinjected to reservoirs to maintain pressure. Table includes data available through Nov. 30, 1993.

²Formerly part of the U.S.S.R.; data were not reported separately until 1992.

³Reported figure.

⁴Dissolved in Dec. 1991.

TABLE 47
LEADING WORLD PRODUCERS OF NATURAL GAS PLANT LIQUIDS¹

(Million 42-gallon barrels)

Country	1988	1989	1990	1991	1992 ²
United States	595	564	569	606	² 621
Saudi Arabia	149	154	195	² 258	263
Russia ³	—	—	—	—	180
Canada	139	151	151	158	² 166
Mexico	133	139	156	165	165
Venezuela	35	37	³ 38	⁴ 41	93
United Arab Emirates ⁵	47	47	58	60	60
United Kingdom	58	51	⁴ 42	⁵ 51	58
Algeria	55	56	56	⁵ 55	53
U.S.S.R. ⁶ ⁴	² 250	² 250	² 250	² 250	—
Total	¹ 1,461	¹ 1,449	¹ 1,515	¹ 1,644	1,659
Other	² 225	² 219	² 203	¹ 175	257
Grand total	¹ 1,686	¹ 1,668	¹ 1,718	¹ 1,819	1,916

⁶Estimated. ⁷Revised.

¹Table includes data available through Nov. 30, 1993.

²Reported figure.

³Formerly part of the U.S.S.R.

⁴Dissolved in Dec. 1991.

TABLE 48
LEADING WORLD PRODUCERS OF CRUDE OIL¹

(Million 42-gallon barrels)

Country	1988	1989	1990	1991	1992 ²
Saudi Arabia	1,890	¹ 1,849	2,354	² 2,963	³ 3,075
Russia ²	—	—	—	—	² 2,900
United States	2,979	2,779	2,685	² 2,715	2,625
Iran	⁸ 18	1,026	1,127	1,217	1,300
China	999	1,004	1,008	1,015	1,050
Mexico	⁹ 17	⁹ 17	⁹ 30	⁹ 77	⁹ 78
Venezuela	691	696	770	872	907
United Arab Emirates	571	715	773	890	850
Norway	³ 98	⁵ 60	⁶ 09	⁶ 79	⁷ 94
United Kingdom	⁸ 21	⁶ 56	⁶ 87	⁶ 84	⁷ 07
Nigeria	569	626	660	690	⁶ 96
Canada	584	584	567	⁵ 64	585
Indonesia	492	514	534	581	551
Libya	374	412	502	⁵ 51	545
U.S.S.R. ³	4,590	4,460	4,190	3,785	—
Total	¹ 16,693	¹ 16,798	¹ 17,396	¹ 18,183	17,563
Other	⁵ ,180	⁵ ,560	⁵ ,209	⁴ ,168	5,071
Grand total	² 1,873	² 2,358	² 2,605	² 2,351	22,634

⁶Estimated. ⁷Preliminary. ⁸Revised.

¹Table includes data available through Nov. 30, 1993.

²Formerly part of the U.S.S.R.; data were not reported separately until 1992.

³Dissolved in Dec. 1991.

TABLE 49
LEADING WORLD PRODUCERS OF REFINED OIL¹

(Million 42-gallon barrels)

Country	1988	1989	1990	1991	1992*
United States	⁶ 6,113	⁶ 6,125	⁶ 6,173	⁶ 6,207	⁶ 6,304
Japan	1,274	1,340	¹ 1,473	¹ 1,561	1,637
China*	725	725	730	800	830
Germany*	⁷ 790	⁷ 765	⁷ 775	⁷ 764	783
United Kingdom*	⁶ 669	663	⁶ 676	⁷ 709	708
Saudi Arabia	526	488	⁵ 559	⁵ 516	⁶ 689
Italy	670	671	⁶ 689	^r ⁶ 680	680
Canada	645	639	637	618	604
Mexico	522	540	572	582	575
France*	532	542	⁵ 563	561	552
Netherlands	⁵ 526	⁵ 520	⁵ 501	^r ⁵ 510	522
Spain*	² 405	400	419	418	408
Venezuela	365	353	388	390	379
Korea, Republic of*	209	257	269	353	360
Iran	219	248	318	³ 329	350
India*	³ 347	350	345	345	345
Russia ³	—	—	—	—	300
U.S.S.R. ⁴	3,160	3,000	2,790	2,535	—
Total	¹ 17,697	¹ 17,626	¹ 17,877	¹ 17,878	16,026
Other	⁵ 5,216	⁵ 5,316	⁵ 5,185	⁴ 4,494	5,801
Grand total	² 22,913	² 22,942	² 23,062	² 22,372	21,827

*Estimated. ^rRevised.

¹Table includes data available through Nov. 30, 1993.

²Reported figure.

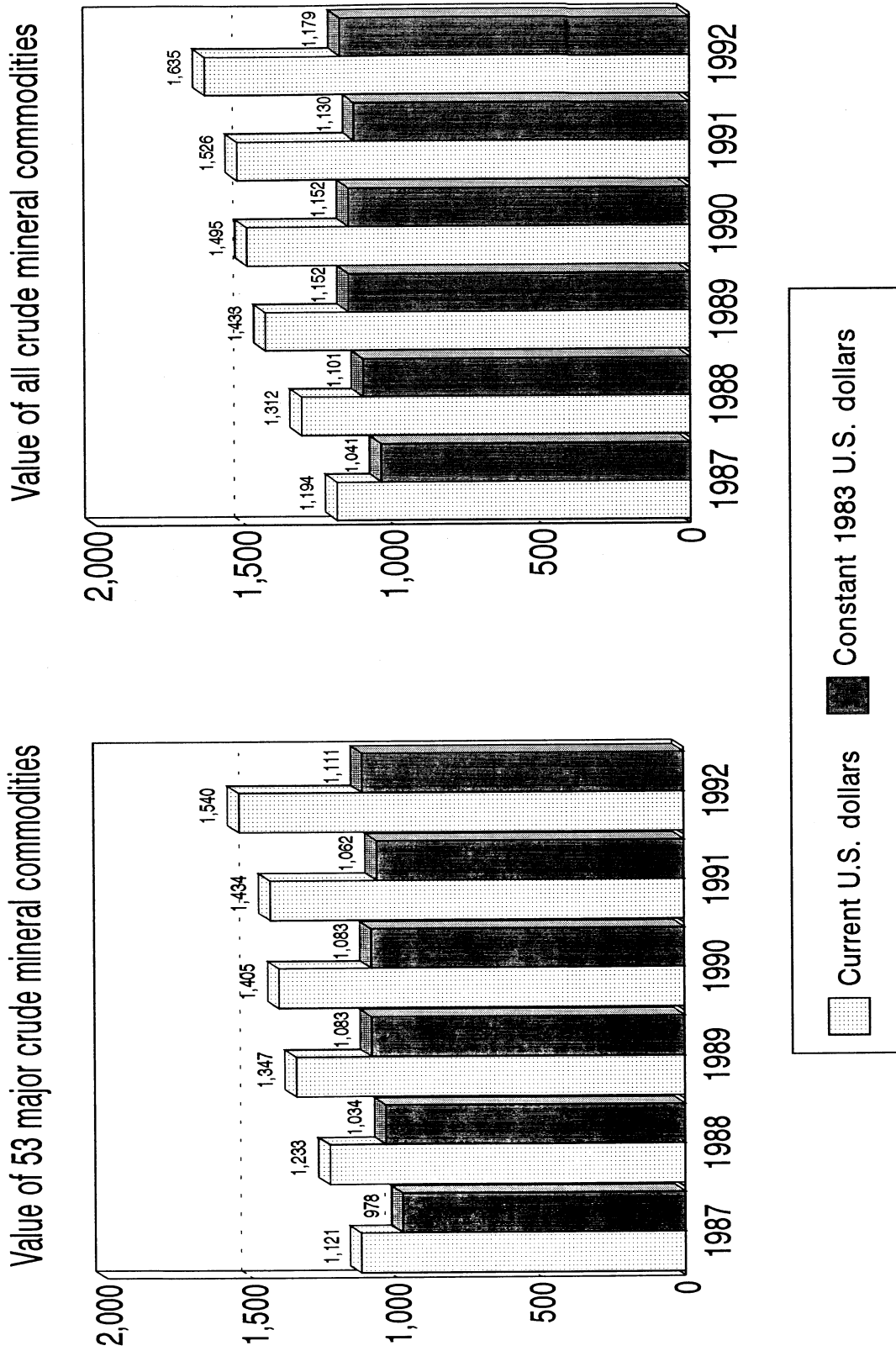
³Formerly part of the U.S.S.R.; data were not reported separately until 1992. Russia is the only former Soviet Republic for which reliable estimates of production can be made.

⁴Dissolved in Dec. 1991.

Sources: U.S. Bureau of Mines; U.S. Department of Energy.

FIGURE 1
ESTIMATED VALUE OF WORLD CRUDE MINERAL PRODUCTION

(Billion U.S. dollars)

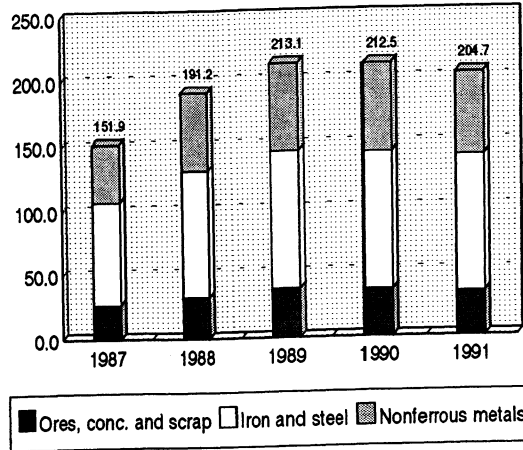


Sources: U.S. Bureau of Mines, *Annales des Mines*, and United Nations

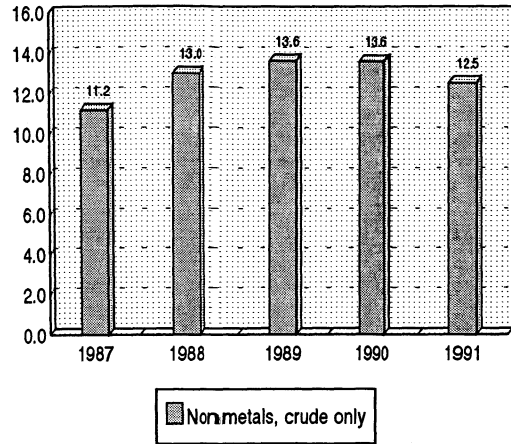
FIGURE 2
VALUE OF EXPORT TRADE IN MAJOR MINERAL COMMODITY GROUPS

(Billion U.S. dollars)

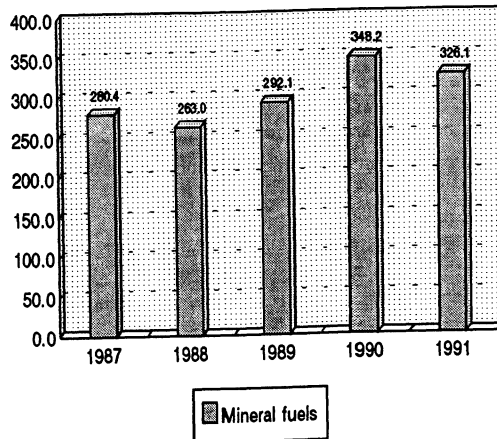
Metals



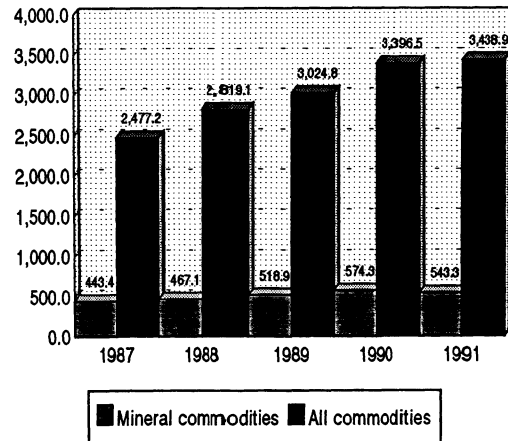
Nonmetals, crude only



Mineral fuels



Grand total of major commodities and total of all commodities



Source: United Nations

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