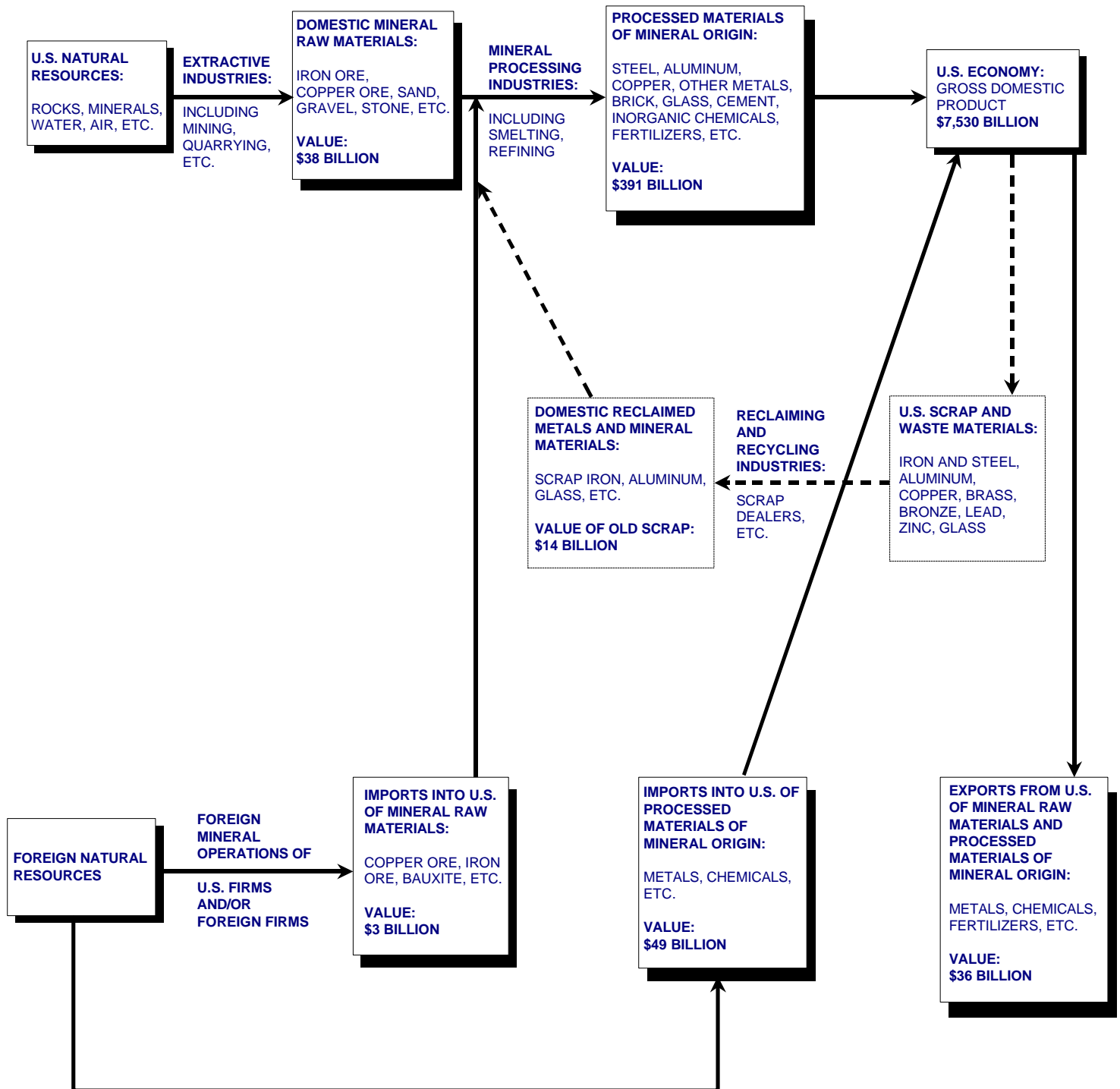
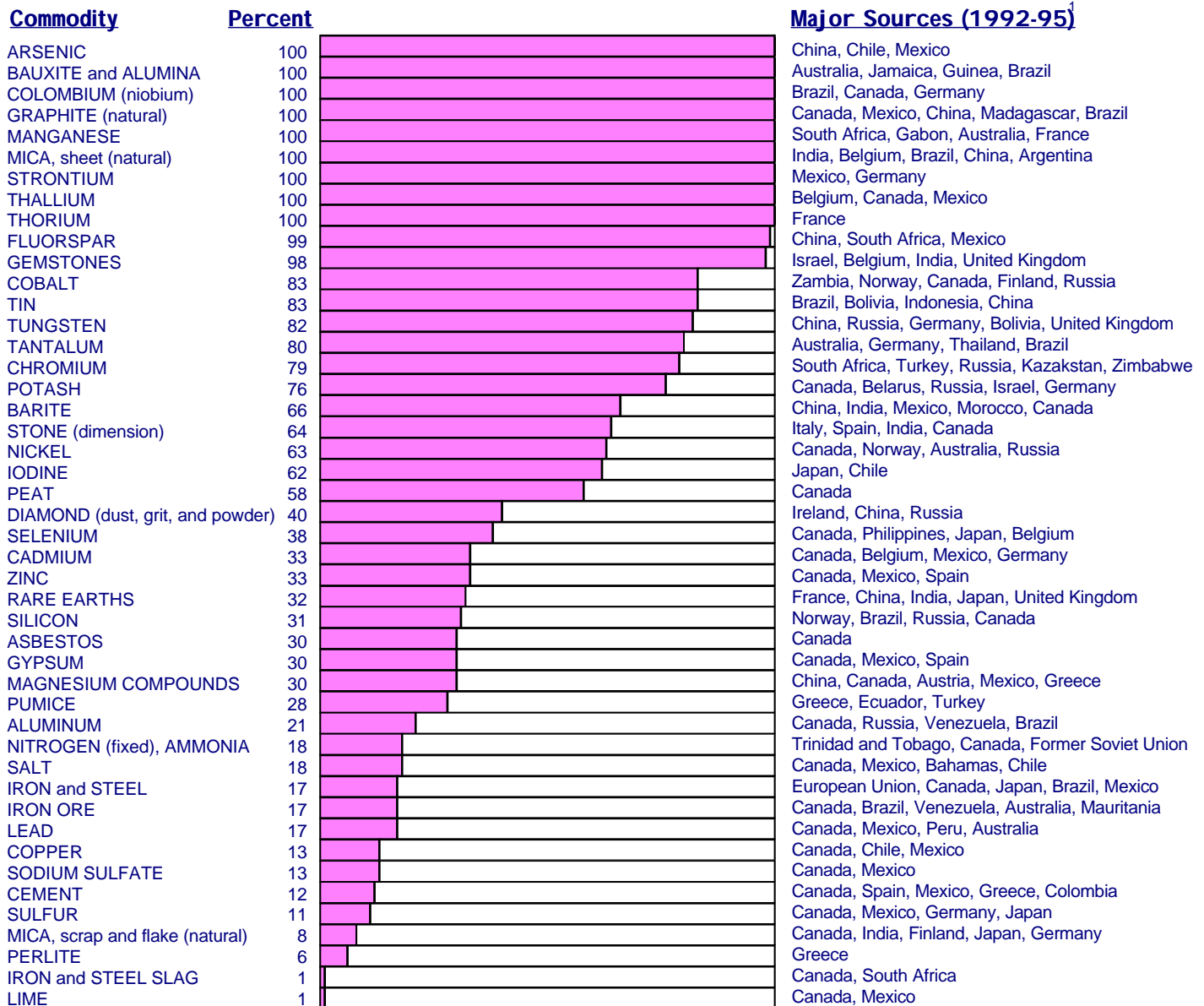


THE ROLE OF NONFUEL MINERALS IN THE U.S. ECONOMY

(ESTIMATED VALUES IN 1996)



1996 U.S. NET IMPORT RELIANCE FOR SELECTED NONFUEL MINERAL MATERIALS



¹ In descending order of importance

Additional commodities for which there is some import dependency include:

Antimony	China, Bolivia, Mexico, South Africa
Bismuth	Mexico, Belgium, China, United Kingdom
Gallium	France, Russia, Germany, Hungary
Germanium	China, United Kingdom, Ukraine, Russia, Belgium
Ilmenite	South Africa, Australia, Canada
Indium	Canada, France, Russia, Italy
Kyanite	South Africa
Mercury	Russia, Canada, Kyrgyzstan, Germany

Platinum	South Africa, United Kingdom, Russia, Germany, Belgium
Rhenium	Chile, Germany, Sweden
Rutile	Australia, South Africa, Sierra Leone
Silver	Mexico, Canada, Peru, Chile
Titanium (sponge)	Russia, Japan, China, Ukraine
Vanadium	South Africa, Canada, Russia, Mexico
Vermiculite	South Africa
Zirconium	Australia, South Africa

SIGNIFICANT EVENTS, TRENDS, AND ISSUES

The Mineral Sector of the U.S. Economy

The U.S. economy and, consequently, the demand for minerals grew at a moderate rate in 1996. Demand for metals, such as steel and copper, was relatively stable or increased compared with 1995. For example, the decline in steel consumed in motor vehicle manufacturing (reflecting lower vehicle sales) during the first three quarters was offset by an increase in steel consumed in construction during the same period. Demand for industrial minerals, especially crushed stone and cement, generally increased compared with the previous year. More detailed information on events, trends, and issues in the mineral and material sector is presented below and in the commodity sections that follow.

Overall Performance

The value of processed materials of mineral origin produced in the United States during 1996 was estimated to be \$391 billion, a slight increase (1.2%) compared with 1995. The estimated value of U.S. raw nonfuel minerals production in 1996 was \$38 billion, a slight decrease (0.9%) compared with 1995. The value of U.S. minerals production has increased in 30 of the last 36 years.

Total U.S. trade in raw minerals and processed materials of mineral origin was valued at \$88 billion in 1996. Imports of processed mineral materials were valued at an estimated \$49 billion, while exports of these materials were valued at an estimated \$33 billion. Imports of metal ores and concentrates and of raw industrial minerals increased almost 8% to \$2.6 billion. Raw minerals exports increased slightly to \$3.1 billion. Demand for metals and other mineral-based materials used extensively in motor vehicle manufacturing declined slightly in 1996 because of the estimated 4% decline in automobile manufacture. The motor vehicle manufacturing sector is a major consumer of other mineral-based materials, chiefly aluminum, copper, lead, platinum-group metals, zinc, glass, plastics, and steel.

The domestic construction industry provided for modest growth in minerals demand. The construction sector is the largest consumer of brick clay, cement, sand and gravel, and stone. Road construction expenditures in 1996 maintained the high levels of the last few years as a result of the 6-year Federal highway and mass transit program reauthorized in 1991. Large amounts of asphalt, cement, crushed stone, and sand and gravel are used in road-building. Apartment building construction and new home construction increased in 1996, which had a salutary effect on the consumption of brick clay, cement, sand and

gravel, steel, and stone.

Responding to domestic and world demand for fertilizer nutrients, the domestic mineral fertilizer manufacturing sector operated at full capacity, which resulted in a strong demand for fixed nitrogen, phosphate rock, and sulfur. Although global fertilizer nutrient consumption increased substantially, U.S. demand at the farm level, where fertilizers are consumed, was lower because of adverse weather conditions.

The Uruguay Round of the General Agreements on Tariffs and Trade (GATT) became effective January 1, 1995. GATT rules, such as those that address market access affected by tariff and nontariff market barriers, are significant to U.S. minerals producers. For example, Uruguay Round GATT agreements eliminate tariffs (during a 10-year period) on steel imposed by the United States and its trading partners, including the European Union and Japan.

Legislation to reform the Mining Law of 1872 has been considered by the Congress and the Administration for the past several years; however, legislation to reform the Mining Law was not enacted in 1996. The Mining Law gives U.S. citizens and corporations the right to prospect for certain minerals on particular Federal lands and confers the right to file claims that permit the claimants to mine and sell minerals found. The Mining Law does not provide for a royalty payment to the Federal Government for minerals that are mined. Under the Mining Law, claimants also may apply for a patent that transfers ownership of minerals and mineral lands to the claimant.

In fiscal year 1996 the Defense Logistics Agency sold excess mineral materials valued at \$391 billion (see "Government Stockpile" in the commodity sections that follow). The Defense Production Act, which provides authority for priorities, allocations, and defense-related supply expansions, is expected to continue.

Outlook

The U.S. economy is expected to continue to grow at a moderate rate for the near term, providing a mild stimulus to the Nation's materials-consuming industries. Inflation is expected to remain low, thus permitting a continuance of low interest rates conducive to an expanding economy. Although motor vehicle sales have declined slightly from their 1994 peak, relatively strong sales are expected to continue because of moderate auto loan interest rates and advantageous monetary exchange rates. The 6-year Federal highway and mass transit program reauthorized

TABLE 1.—U.S. MINERAL INDUSTRY TRENDS

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996^e</u>
Total mine production: ¹					
Metals	11,547	10,819	12,111	14,064	12,654
Industrial minerals	20,574	21,177	23,085	24,421	25,510
Coal	20,978	18,767	20,060	19,451	19,289
Employment: ²					
Coal mining	103	86	90	85	81
Metal mining	42	40	39	41	41
Industrial minerals, except fuels	76	76	78	80	83
Chemicals and allied products	567	573	578	578	567
Stone, clay, and glass products	396	399	411	417	418
Primary metal industries	525	520	537	552	549
Average weekly earnings of production workers: ³					
Coal mining	755	767	803	828	854
Metal mining	655	659	699	735	759
Industrial minerals, except fuels	550	585	610	624	657
Chemicals and allied products	625	639	654	675	700
Stone, clay, and glass products	490	506	526	534	555
Primary metal industries	587	611	641	643	662

^eEstimated.

¹Million dollars.

²Thousands of production workers.

³Dollars.

Sources: U.S. Geological Survey; U.S. Department of Energy, Energy Information Administration; U.S. Department of Labor, Bureau of Labor Statistics.

at yearend 1991 will continue to provide an impetus for consumption of stone, sand and gravel, and steel through 1997. The demand prospect for mineral fertilizer materials (i.e., fixed nitrogen, phosphate rock, potash, and sulfur) is expected to be robust in the coming year because low world stocks of grains and oilseeds should stimulate increased planting.

Significant International Events¹

In addition to the further delineation of the world class resource base and development potential of the Voisey's Bay nickel deposit in Labrador, Canada, and the Busang gold deposit in Kalimantan, Indonesia, 1996 was marked by the ongoing capacity of Canadian equity capital markets to generate investments for worldwide exploration and mining development. Canadian capital

markets contributed a significant share of more than \$3.5 billion (U.S.) in corporate exploration expenditures in 1996 as reported by the Metals Economics Group (MEG) of Halifax, Nova Scotia. The MEG study which, covers the exploration budgets of 223 companies, captures about 76% of total worldwide expenditures. Exploration budgets were distributed regionally as follows: Latin America (27.3%), Australia (18.9%), Canada (13.1%), Africa (11.9%), Asia and the Pacific (11.8%), United States (9.7%), and the rest of the world (7.3%). The areas most benefitting from increased exploration expenditures in 1996, compared with 1995, were Asia and the Pacific, Canada, and Africa.

Global commodity priorities were focused on gold, diamonds, nickel, steel, aluminum, cobalt, and base-metals, the latter despite the effect of the copper trading

TABLE 2.—U.S. MINERAL-RELATED ECONOMIC TRENDS

	1992	1993	1994	1995	1996 ^e
Gross domestic product (billion dollars)	6,240	6,550	6,940	7,250	7,530
Capital expenditures (billion dollars):					
All industries	546 ¹	490	550 ^p	594 ^p	603
Manufacturing	174 ¹	134	153 ^p	172 ^p	185
Mining and construction	9 ²	31	36 ^p	36 ^p	34
Industrial production (1987=100):					
Total index	108	112	118	122	126
Manufacturing	108	112	120	124	128
Stone, clay, and glass products	95	98	102	104	106
Primary metals	102	108	117	119	120
Iron and steel	105	112	119	122	124
Nonferrous metals	98	102	112	115	115
Chemicals and chemical products	114	115	121	125	129
Mining	99	98	100	100	101
Metals	164	162	163	169	165
Coal	108	103	113	113	114
Oil and gas extraction	93	93	93	92	93
Stone and earth minerals	99	101	107	112	116
Capacity utilization (percent): ³					
Total industry	80	81	84	84	83
Mining	87	87	90	89	90
Metals	87	84	85	87	84
Stone and earth minerals	84	85	89	91	91
Housing starts (thousands)	1,200	1,290	1,460	1,350	1,500
Automobile production (thousands)	5,660	5,980	6,610	6,350	6,050
Highway construction, all public, expenditures (billion dollars)	29	31	33 ^p	35 ^e	36

^eEstimated. ^pPreliminary.

¹From survey of new plant equipment and expenditures.

²From survey of new plant equipment and expenditures, mining industry only.

³1996 estimates based on seasonally adjusted figures.

Sources: U.S. Department of Commerce, Federal Reserve Board, American Automobile Manufacturers' Association, and U.S. Department of Transportation.

scandal on copper markets. The demand for industrial minerals and construction materials was fueled by new economic growth in Asia and Latin America, along with the need to rebuild aging infrastructure in North America and Europe. Trends in privatization of state-owned

mining and processing enterprises in Europe, Asia, Africa, and Latin America continued with more willingness of governments to take on private joint-venture partners in countries where the national sentiment was to maintain ownership of natural resources.

Africa

Africa witnessed a major resurgence in mineral exploration and mineral project planning in 1996. Diamond exploration and development continued in South Africa, Botswana, Namibia, Angola, and Zaire, while the gold rush continued in Africa, especially in Burkina Faso, Eritrea, Ethiopia, Ghana, Mali, Niger, Tanzania, and Zaire. Canadian, South African, and Australian companies were leading the current exploration activity in Africa. The Central African Republic, Côte d'Ivoire, Guinea, and Senegal were also experiencing increased interest by international investors in their gold resources. Gold output continued to surpass old production records in Ghana and Zimbabwe. Other new activity in Africa's mineral industry included rutile exploration at Akonolinga in Cameroon, the investigation of the Biankouma-Touba nickel deposit in Côte d'Ivoire, and the development of new bauxite deposits and the resumption of diamond exploration in Guinea. In Kenya, the only fluor spar producer was privatized and a Canadian firm was evaluating coastal ilmenite sands. Processing operations to recover cobalt from stockpiled pyrite concentrates at Kilembe in Uganda were underway. Mining began at the Hartley platinum mine in Zimbabwe during March 1996. Offshore Africa showed significant petroleum exploration activity. New development occurred off Cameroon, Côte d'Ivoire, Equatorial Guinea, Guinea-Bissau, Nigeria, and Senegal. The development of Chad's Doba Basin and the utilization of flared natural gas in Nigeria were progressing rapidly.

At approximately 490 tons, gold production in South Africa in 1996 was the lowest in 40 years. The depreciating value of the South African rand helped offset higher internal gold production costs and lower dollar export earnings. The six major South African mining houses continued both their corporate "unbundling" and their diversification of investments outside of South Africa, with a particular eye to new exploration and development opportunities elsewhere in Africa. As part of Black Economic Empowerment initiatives in South Africa, two African-owned mining-related commercial firms were established in 1996, stimulated by offers to purchase unbundled Anglo-American assets. In the policy arena, the South African Government was expected to release its Green Paper on Mining by yearend. Expectations were that it would promote a positive environment for growth and employment in the mining sector.

The Zambia Privatization Agency issued an international tender to prospective investors to buy the mining and electricity distribution assets of the national mining corporation. A company formed by former employees of the corporation acquired 100% ownership of the closed Kabwe lead-zinc mine and announced plans to restart

production initially from old tailings.

Civil war adversely affected mining in Liberia, Rwanda, Somalia, and Sudan; however, in the Central African Republic, diamond production continued despite repeated attempted coups. In Sierra Leone, the rutile mine remained closed in 1996 but reported little external damage to major equipment resulting from insurgent actions at the site in January 1995. Despite political uncertainties, most of 1996 saw increased interest by foreign investors in the minerals sector of Zaire. A Canadian firm acquired a 72% interest in the gold mines and properties of a Zairian firm and had announced plans for a \$20 million development program. However, the Mobale gold mine near Kamituga in eastern Zaire was heavily damaged, and normal supply routes through Bukavu were disrupted during fighting between the Zaire army and local insurgents late in the year.

In north Africa, private investment has contributed significantly to the mining and metallurgical segments of the Egyptian and Moroccan economies. A number of major new industrial projects in cement, fertilizers, metals, and petrochemicals attracted private investment capital. In Egypt, the sole aluminum producer reduced Government equity in favor of private capital by 20%, while continuing its expansion program to raise annual smelter capacity by 60,000 tons in 1997 to a total annual capacity of 240,000 tons. The country's iron and steel producer has embarked on an expansion and modernization program costing \$350 million. The expansion is scheduled for completion in 1997. Morocco and Western Sahara host over 50% of the world's phosphate rock reserves and are the world's largest phosphate rock exporters. The Sidi Chennane mine became operational in 1996 and should have an annual capacity of 5 million tons by 1998.

Middle East

In the Middle East, aluminum smelter expansion activities have progressed on schedule in Bahrain and in Dubai, United Arab Emirates. The expansion of Bahrain's aluminum smelter is expected to be operational by May 1997, and additional capacity at Dubai's aluminum smelter is scheduled for completion by September 1997. A U.S.-based firm began commercial exploitation of the Al Masane polymetallic deposit in Saudi Arabia. The deposit is estimated by ASDC to total 7.2 million tons containing 5.3% zinc, 1.42% copper, 40 grams per ton silver, and 1.19 grams per ton gold.

Asia and the Pacific

In October 1996, the Australian Government proposed legislative amendments to its 3-year-old Native Title Act

TABLE 3.—VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 1996 ¹

State	Value (thousands)	Rank	Percent of U.S. total	Principal minerals, in order of value
Alabama	\$735,000	17	1.93	Cement (portland), stone (crushed), lime, sand and gravel (construction), clays.
Alaska ²	523,000	25	1.37	Zinc, lead, gold, sand and gravel (construction), stone.
Arizona	3,530,000	1	9.25	Copper, sand and gravel (construction), cement (portland), molybdenum, lime.
Arkansas	453,000	29	1.19	Stone (crushed), bromine, cement (portland), sand and gravel (construction), gemstones.
California	2,840,000	3	7.43	Sand and gravel (construction), cement (portland), boron minerals, gold, stone (crushed).
Colorado	528,000	23	1.38	Sand and gravel (construction), cement (portland), molybdenum, stone (crushed), gold.
Connecticut	103,000	44	0.27	Stone (crushed), sand and gravel (construction), stone (dimension), clays, gemstones.
Delaware ²	10,700	50	0.03	Sand and gravel (construction), magnesium compounds, gemstones.
Florida	1,540,000	8	4.03	Phosphate rock, stone (crushed), cement (portland), sand and gravel (construction), clays.
Georgia	1,720,000	6	4.51	Clays, stone (crushed), cement (portland), stone (dimension), sand and gravel (construction).
Hawaii ²	112,000	43	0.29	Stone (crushed), cement (portland), sand and gravel (construction), cement (masonry), gemstones.
Idaho	411,000	32	1.08	Gold, phosphate rock, molybdenum, sand and gravel (construction), silver.
Illinois	777,000	16	2.04	Stone (crushed), cement (portland), sand and gravel (construction), sand and gravel (industrial), clays.
Indiana	617,000	21	1.62	Stone (crushed), cement (portland), sand and gravel (construction), lime, cement (masonry).
Iowa	490,000	28	1.28	Stone (crushed), cement (portland), sand and gravel (construction), gypsum, lime.
Kansas	524,000	24	1.37	Cement (portland), helium (Grade-A), stone (crushed), salt, sand and gravel (construction).
Kentucky	452,000	30	1.19	Stone (crushed), lime, cement (portland), sand and gravel (construction), clays.
Louisiana	428,000	31	1.12	Salt, sulfur (Frasch), sand and gravel (construction), stone (crushed), sand and gravel (industrial).
Maine	73,100	45	0.19	Sand and gravel (construction), cement (portland), stone (crushed), cement (masonry), peat.
Maryland ²	324,000	36	0.85	Stone (crushed), cement (portland), sand and gravel (construction), cement (masonry), stone (dimension).
Massachusetts	191,000	39	0.50	Sand and gravel (construction), stone (crushed), stone (dimension), lime, clays.
Michigan	1,510,000	9	3.95	Iron ore (usable), cement (portland), sand and gravel (construction), magnesium compounds, stone (crushed), salt.

See footnotes at end of table.

TABLE 3.—VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 1996 ¹—Continued

State	Value (thousands)	Rank	Percent of U.S. total	Principal minerals, in order of value
Minnesota	\$1,800,000	4	4.72	Iron ore (usable), sand and gravel (construction), stone (crushed), sand and gravel (industrial), stone (dimension).
Mississippi	140,000	42	0.37	Sand and gravel (construction), clays, cement (portland), stone (crushed), sand and gravel (industrial).
Missouri	1,250,000	10	3.28	Lead, stone (crushed), cement (portland), lime, zinc.
Montana	523,000	26	1.37	Gold, copper, cement (portland), zinc, sand and gravel (construction).
Nebraska	147,000	41	0.39	Cement (portland), sand and gravel (construction), stone (crushed), clays, cement (masonry).
Nevada	3,200,000	2	8.37	Gold, silver, sand and gravel (construction), copper, diatomite.
New Hampshire ²	43,900	47	0.11	Sand and gravel (construction), stone (crushed), stone (dimension), clays, gemstones.
New Jersey ²	222,000	38	0.58	Stone (crushed), sand and gravel (construction), sand and gravel (industrial), greensand marl, peat.
New Mexico	963,000	12	2.52	Copper, potash, sand and gravel (construction), cement (portland), stone (crushed).
New York	891,000	15	2.33	Stone (crushed), cement (portland), salt, sand and gravel (construction), zinc.
North Carolina	731,000	18	1.92	Stone (crushed), phosphate rock, lithium minerals, sand and gravel (construction), sand and gravel (industrial).
North Dakota	30,300	49	0.08	Sand and gravel (construction), lime, clays, sand and gravel (industrial), gemstones.
Ohio	934,000	13	2.45	Stone (crushed), salt, sand and gravel (construction), lime, cement (portland).
Oklahoma	372,000	34	0.98	Stone (crushed), cement (portland), sand and gravel (construction), sand and gravel (industrial), gypsum.
Oregon	251,000	37	0.66	Stone (crushed), sand and gravel (construction), cement (portland), lime, diatomite.
Pennsylvania ²	1,040,000	11	2.72	Stone (crushed), cement (portland), lime, sand and gravel (construction), cement (masonry).
Rhode Island ²	31,900	48	0.08	Sand and gravel (construction), stone (crushed), sand and gravel (industrial), gemstones.
South Carolina	495,000	27	1.30	Cement (portland), stone (crushed), gold, sand and gravel (construction), cement (masonry).
South Dakota	353,000	35	0.93	Gold, cement, (portland), sand and gravel (construction), stone (crushed), stone (dimension).
Tennessee	648,000	19	1.70	Stone (crushed), zinc, cement (portland), sand and gravel (construction), clays.
Texas	1,780,000	5	4.67	Cement (portland), sand and gravel (construction), stone (crushed), magnesium metal, lime.
Utah	1,560,000	7	4.09	Copper, gold, magnesium metal, sand and gravel (construction), molybdenum.
Vermont ²	66,800	46	0.17	Sand and gravel (construction), stone (dimension), stone (crushed), talc and pyrophyllite, gemstones.

See footnotes at end of table.

TABLE 3.—VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 1996¹—Continued

State	Value (thousands)	Rank	Percent of U.S. total	Principal minerals, in order of value
Virginia	\$529,000	22	1.39	Stone (crushed), cement (portland), sand and gravel (construction), lime, kyanite.
Washington	626,000	20	1.64	Sand and gravel (construction), magnesium metal, cement (portland), stone (crushed), gold.
West Virginia	191,000	40	0.50	Stone (crushed), cement (portland), sand and gravel (construction), lime, salt.
Wisconsin	399,000	33	1.04	Stone (crushed), sand and gravel (construction), copper, sand and gravel (industrial), lime.
Wyoming	918,000	14	2.41	Soda ash, clays, helium (Grade-A), cement (portland), stone (crushed).
Undistributed	145,000	XX	0.38	
Total	38,200,000	XX	100.00	

XX Not applicable.

¹Data are rounded to three significant digits; may not add to totals shown.

²Partial total, excludes values that must be concealed to avoid disclosing company proprietary data. Concealed values included with "Undistributed".

(NTA). Under the proposals, a Federal minister could override Aboriginal concerns if these threatened a project of major economic benefit to Australia. The manager-operator of the Argyle diamond mine in Western Australia, did not renew its marketing agreement with the Central Selling Organization upon the expiration of the contract. Argyle, the world's biggest single-mine producer of diamond with output equivalent to about 40% of world production, now sells all of its rough (uncut) production through its European Sales Office in Antwerp, Belgium. The Australian Government ended its 12-year-old policy of restricting uranium production to three sites following the Federal election in March 1996 and the installation of the Liberal-National Party Coalition Government. In China, the Standing Committee of the 8th National People's Congress approved the amendments to the Mineral Resources Law on August 29, 1996, taking effect on January 1, 1997. The amendments strengthen the State ownership of China's mineral resources and allow the local governments responsibility for guaranteeing exploration and exploitation of mineral resources. The amendments also allow private enterprises and Sino-foreign joint-venture companies to participate in the exploration and exploitation of mineral resources under the supervision of the State in China. Also, on August 29, 1996, the Committee approved the Coal Law that took effect on December 1, 1996. The Coal Law stated that all coal resources in China continued to be the property of the State and will remain so regardless of any changes in the surface land ownership or the right of use of the land where the coal is located. The State protects lawful

exploration rights and mining rights from any encroachment and ensures against any interference and disruption of operations in mining areas and exploration sites. The Coal Law also confirms that mining rights cannot be sold or leased. The Ministry of Coal Industry is responsible for administrating and enforcing the Coal Law. The Indian Government announced in October 1996 that applications for foreign investment of up to of 50% in a particular project or company in the minerals industry would be given automatic approval. However, in the case of diamonds and other precious stones, gold, and silver, the Foreign Investment Promotion Board will continue to consider each application on a case-by-case basis. India's largest private aluminum company began boosting capacity at its Renukoot Smelter in Uttar Pradesh State.

Daily ore throughput and copper and gold production at the Grasberg mine in Irian, Jaya, Indonesia was planned to be increased; a prefeasibility study supported mine expansion. The construction of Indonesia's first copper smelter at Gresik near Surabaya, Java began in July. Reserve increases were announced at the major Busang gold find in East Kalimantan, Indonesia. In December 1996, measured and indicated reserves of 23 million ounces of gold and an additional inferred resource of 34 million ounces of gold were reported, making this one of the world's larger gold deposits.

In Japan, on June 13, 1996, a major Japanese trading company, announced that it incurred a \$1.8 billion loss

during the past 10 years as a result of unauthorized copper trading activity by a senior official in its nonferrous metals division. The huge copper trading loss was raised to \$2.6 billion in August 1996. The news occupied the world's financial headlines and caused the price of copper to drop to its 2-year low in mid-1996. In December, three major copper producers announced plans to expand their domestic smelting capacity by 10% to 20% by the year 2000 to meet the growing demand for copper in the Southeast Asian region. In 1996, several major Japanese copper producers also increased their investment in overseas mine development in Canada and Chile to secure the raw materials required for their domestic smelters.

In the Philippines, an agreement was approved in March 1996 for a 50-year lease agreement covering the Carmen copper mine and concentrator in the central island of Cebu. An investment of \$65 million to rehabilitate and reopen the mine within 2 years was provided. The Philippine Government's Asset Privatization Trust announced on May 7, 1996, that it was selling its Nonoc nickel mine, smelter, and refinery on Nonoc Island in the southern Philippines to a consortium of Australian, British, Filipino, and Hong Kong investors, for \$333 million. In addition to rehabilitating the nickel smelter and refinery, the consortium was planning to construct, within 16 months, a 1,360-ton-per-year cobalt refinery. The final agreement between the Government, landowners, and the Australian firm that will operate the mine, for the mining of the Gold Ridge gold deposits on Guadalcanal Island, Solomon Islands, was signed in October 1996, in the National Parliament in Honiara.

Europe and Central Eurasia

The European Union (EU) increased from 12 to 15 countries, when Austria, Finland, and Sweden formally became members. After a period of low growth and recession in most areas, Western Europe's economic development was moving ahead. There continued to be an increase in investment flows in 1996. The modest economic growth in major EU countries resulted in increased consumption of minerals, allowing prices to rise to profitable levels for producers of some commodities. Efforts were continuing by various EU nations toward (1) privatization of nationalized mining companies and State-owned mineral enterprises, (2) liberalization of investment laws allowing foreign ownership of mining companies, and (3) increased repatriation of profits. Government support for high-cost production was withdrawn or significantly reduced. Various incentives, including tax relief, revised regulations, and less government involvement have also been offered to encourage exploration.

In Western Europe, exploration for gold, bauxite, copper, lead, and zinc continued. Discoveries of gold mineralization in southwest Greenland; southern Sardinia, Italy; east-central Portugal; and the West Central Highlands of Scotland, United Kingdom, encouraged further exploration efforts. Also, the discovery of diamondiferous kimberlites in West Greenland has increased exploration in that area. Exploration for copper in France and Portugal and lead and zinc in Ireland and Spain continued. Zinc production began at the Mulikkorame mine near Pyhajarvi Finland in mid-1996.

In 1996, the countries of Eastern Europe and Central Europe developed market economy systems through the denationalization of state-owned and -operated commercial enterprises. The rapid decline of industrial production that occurred in this region from 1990-94, following the dissolution of central economic planning and attendant organizations, such as the Council for Mutual Economic Assistance, largely had abated by yearend 1994. In both 1995 and 1996, the production of some sectors of the minerals industries in these countries stabilized and in some cases displayed growth (crude steel generally and refined copper in Poland). In 1996, a marked degree of stability was discernible in the republics of the former Yugoslavia, owing chiefly to the effective implementation of the current peace accords. Foreign investment in Eastern and Central Europe continued to focus on two principal areas: gold exploration and mine development and acquisition of cement plants and construction materials enterprises. Cement plants and associated limestone and gypsum quarries in the Czech Republic, Hungary, Poland, and Slovakia continued to attract Western European investors.

In the countries of the former Soviet Union (FSU), 1996 saw a continuation of the trend for the recovery of mineral production and the reversal of the steep decline in mineral output that followed the breakup of the FSU. In 1996, net increases or decreases in mineral production in the FSU occurred at a slower rate than from 1992 to 1994 when the decrease was often precipitous. The rate of recovery for mineral production varied from country to country and sector to sector. Again, in 1996, operation of mining enterprises continued to be driven by the need to generate hard currency through exports, irrespective of other operating or market considerations. There has been no significant increase in domestic FSU mineral consumption, which had fallen dramatically after the breakup. Some of the worst performing mineral industry sectors were those that produced mineral products mainly for domestic consumption and those that had limited export markets.

Processes to convert the mineral industries of the FSU countries to a market economy continued in the form of

privatization, foreign investment, and foreign participation in the management of mineral industries. The FSU countries continued to try to attract foreign investment in their mineral sectors. As in previous years, Western participation took a number of forms with the most prominent being investment in the development of gold and oil deposits; metals trading; toll smelting; supplying equipment and raw materials to enterprises in return for output; purchasing shares of enterprises; and providing managerial and technical expertise. Kazakstan took the lead in soliciting the aid of foreign management, having turned over the majority of its major mining and metallurgical industries to foreign managers for a limited number of years. A number of other FSU countries followed suit on a more limited scale. In addition to increased reliance on expatriate managers, the FSU countries continued reorganizing domestic governmental structures involved in managing and directing the mineral sector and related activities. For example Russia went through a major reorganization of its governmental departments. The majority of Russian government agencies involved in mineral exploration, nonfuel mineral production, and environmental issues were abolished. Their functions were transferred to the newly created Russian Ministries for Industry and Natural Resources and the State Committee for the Protection of the Environment.

Latin America and Canada

Privatization of state-owned mineral firms, and joint ventures between foreign investors and domestic private and public sectors in Latin America, created new and changing capital investment flows. According to the United Nations Economic Commission for Latin America and the Caribbean, private capital flows to the region in 1996 approached \$55 billion. From 0.7% growth in 1995, the combined regional gross domestic product (GDP) grew about 3% in 1996 and was projected to increase about 4.3% in 1997. According to the Metals Economic Group, \$963 million was spent on mineral exploration in Latin America in 1996 with Chile and Peru being the most actively explored. During 1996, more than 60 junior exploration and mining companies were active throughout the length of the Andean chain. As a result of changes to the petroleum laws of Argentina, Bolivia, Chile, and Peru, there was increased interest in exploration by international oil firms.

Despite a plunge of 50% in the value of the peso versus the dollar and an overall sag in the economy and the GDP, Mexico's mineral industry continued to maintain a position of prominence in production and exports, particularly in the metals sector. A combination of improvement of world metals prices and the peso devaluation enabled Mexican companies to sell into the

world markets at enhanced prices and significantly reduced mining and processing costs, thus increasing export revenues and net income. Production of industrial minerals, mainly construction materials, suffered somewhat because of lowered demand caused by the economic recession. Although privatization in the mining sector with increased foreign investment continued, the Government unexpectedly canceled the proposed sale of several petrochemical plants it had offered to foreign buyers.

The signing of the Cuban Liberty and Solidarity (Libertad) Act, also known as the Helms-Burton Law, by the U.S. President in March, affected the minerals industry directly because of the importance of nickel production and trade to the Cuban economy and because of the increased interest by foreign exploration companies in Cuba, which resulted from its changes in foreign investment laws and mining regulations. Elements of the U.S. law, which allows U.S. citizens whose properties were expropriated by the Cuban Government the right to sue in U.S. courts any foreign company presently using such properties and which denies foreign company officials entry into U.S. territory, generated criticism from other nations. In November, the World Trade Organization agreed to hear the European Union's complaint that the law violates open trade rules. Also in November, Canada passed legislation that allows Canadian companies sued in U.S. courts to counter-sue in Canadian courts to recover damages resulting from the Helms-Burton Act. The President of the United States suspended the implementation of the right to sue in U.S. courts at yearend.

Central American countries wrestled with problems ranging from the restoration of political stability to the establishment of workable mining laws and privatization. The interest of foreign mining companies in each Central American country increased almost as fast as the respective countries promulgated workable mining laws. Unusually large copper deposits were further delineated in Panama, and exploration for gold was on the increase in most of the countries of the region.

In 1996, the South American trading bloc MERCOSUR (Argentina, Brazil, Paraguay, and Uruguay) aggressively sought Chile's accession to MERCOSUR. Currently, the two economic blocs, MERCOSUR and the ANDEAN PACT (Bolivia, Colombia, Ecuador, Peru, and Venezuela) are negotiating a free trade accord.

In Argentina, privatization of business ownership and operations continued. New investments in Argentina, aided by Federal and provincial investment laws that encouraged mineral exploration and development, were directed toward copper, gold, crude oil, natural gas, petrochemicals, and gas pipelines. By yearend

construction was completed on more than one-half of the \$903 million Bajo de la Alumbrera project. A slurry pipeline is being built to help export 800,000 tons of copper concentrates a year.

Bolivia has recently undertaken significant legal and regulatory reforms, including the enactment of a single corporate income tax rate of 25%. A new environmental law was put in place to balance the need for improved environmental protection with the imperative of sustainable economic development. Bolivia is also nearing the completion of a revised mining code ensuring equal treatment of foreign and domestic investors; providing maximum legal and technical protection to holders of mineral rights; and facilitating and motivating exploration, mineral development, and profitable mineral production. The Bolivian Government has established two programs to encourage domestic and foreign entrepreneurs to invest in the mining sector. The first allows for the transfer of ownership and management of state-owned corporations to private shareholders, via a 50/50 joint venture, referred to as "capitalization" between investors and Bolivian citizens. The second is aimed at attracting foreign investment into the mineral fuels sector, via the Bolivia-Brazil energy integration agreement.

The state-owned steel industry of Brazil was privatized in 1996 and the petrochemical and mining sectors proceeded toward privatization. New projects in the petroleum sector, however, will be open to joint ventures. The state-owned mining giant is scheduled for privatization in early 1997.

The Chilean state-owned copper mining corporation was proceeding with the materialization of its principal projects in its 1994-2000 6-year-plan including the Radomiro Tomic mine and the expansion of the Andina and El Teniente's Esmeralda project. Radomiro Tomic is expected to be in full production by the start of 1998, adding 150,000 tons of copper cathodes to the company's total production. Andina required an investment of \$322 million to increase production by 111,000 tons annually, and the Esmeralda project required a \$205 million investment to allow the El Teniente Division to maintain a production level of 350,000 tons per year.

During 1996, Peru continued with its privatization, capitalization, and joint-venture programs. Peru's largest and world's fourth largest zinc producer, sold its Casapalca polymetallic unit for \$12.7 million to a Brazilian company, which offered to commit an additional \$100

million to upgrade the existing mine and concentrating plant.

Since the early 1990's, Venezuela has taken steps to open petroleum investment to the private sector. In January 1996, the Government awarded eight new exploration and production concessions of light to medium crude to foreign private companies. The concessions and other opportunities for foreign investment in the sector, such as awards of additional marginal fields and participation in the petrochemical and heavy oil projects, are tied to the state-owned petroleum company's plans to double its petroleum, condensate, and natural gas output by 2005 through joint ventures and other associations. Venezuela has embarked on privatization efforts with limited success in the past, but continued with divestment plans in sectors such as steel and ferroalloys.

A positive year for the Canadian economy saw some uneven spots in Quebec and the Maritime Provinces, where unemployment remained unacceptably high. However, all expectations were for a strong 1997 with foreign investment continuing to support the boom in mining and resource sectors. With interest rates the lowest they have been since World War II and the Federal deficit almost gone, Canada seemed poised for what various international studies have predicted would be the best economic performance of any developed nation in 1997. Benefits from the North American Free Trade Agreement (NAFTA) plus the general expansion of world trade are pointing toward earnings abroad exceeding expenditures for the first time since the mid-1980's. Late in 1996, Canada signed a trade treaty with Chile, eliminating tariffs on the greater part of the \$0.5 billion yearly trade between the two countries and paving the way for Chile to join Canada, the United States, and Mexico in the NAFTA. Overall, total 1996 exploration expenditures in Canada (\$461.8 million) were second only to those in Australia (\$665.9 million).

Many Canadian mining companies, however, continued to turn to Latin America for exploration and development because of less restrictive laws and legal challenges than in their own country. Nonetheless, the mining industry within Canada was spurred by higher prices for base metals, and also by some conspicuous exploration successes, such as the Voisey's Bay nickel-copper-cobalt deposit. Argentina, Newfoundland, was selected as the site for the smelter/refinery complex to process the nickel and cobalt concentrates produced at Voisey's Bay.

The Government of Quebec reported that its own geologists found gossans near Sept-Iles grading in the ranges of 1.4% to 2.2% nickel, 1.5% to 5.9% copper, and 0.12% cobalt in an 800-square-kilometer area. In British

Columbia, development of the new Huckleberry open pit copper-molybdenum-gold-silver mine continued. Elsewhere, near Gander, Newfoundland, development of what is thought to be the largest antimony mine outside China also continued. A milestone was passed when the Canadian Government's cabinet gave full approval and support to the Lac de Gras diamond project in the Northwest Territories near the Arctic Circle. In Manitoba, the country's largest nickel-producing firm continued its

expansion of mines and facilities at the Thompson Nickel Belt.

¹The regimes of some countries mentioned in this volume may not be recognized by the U.S. Government. The information contained herein is technical and statistical and is not to be construed as conflicting with or contradictory to U.S. foreign policy.