

## THE MINERAL INDUSTRY OF

# FRANCE

By Harold R. Newman

France was a major European mineral producer despite traditional mineral industries being in a state of transition during the past few years from an economy that featured extensive Government ownership and intervention to one that relies more on market mechanisms. International pressures of globalization and more direct pressure from the European Union (EU) were behind the trend away from Governmental involvement in industry. In accordance with EU requirements, the reduction of Government subsidies to support uneconomic mineral operations continued in 2002.

Changing economic conditions, such as rising energy costs, increased imports of raw materials from other countries, lower prices owing to increased competition, and depletion of mineral reserves, have necessitated the closing or reduced output of such traditionally strong mineral extractive operations as bauxite, coal, and iron ore.

### Government Policies and Programs

Efforts to promote the private sector and to reduce the dependence of state-owned companies on subsidies were continuing. The Government was proceeding with its program of privatization that required large state-controlled companies to reduce the direct role of the Government in their operations. Efforts included fiscal reform, implementation of EU liberalization and deregulation directives, and privatization. Nevertheless, the Government continued its involvement in the functioning of the economy through national and local budgets, remaining State holdings of major corporations, and extensive regulation of labor, goods, and services markets.

### Environmental Issues

When it was established in 1971, the Ministry for the Protection of Nature and the Environment (now the Ministry of the Environment) was at that time responsible for coordinating the different activities of the various ministries and organizing the United Nations Conference in Stockholm, Sweden, in 1972.

During the past 30 years, the responsibilities have expanded. In 2002, the Ministry of the Environment was responsible for monitoring the quality of the environment; protecting nature, preventing, reducing, or totally eliminating pollution and other nuisances; and enhancing the quality of life. With this in mind, it conducted two different types of actions. The first was preserving and protecting spaces and species; this included the prevention of pollution and major risks, nature conservation, protection of landscapes and sites, and management of water resources. The second was developing research, improving knowledge of the state of the environment, and taking account of concerns at European and international levels (Ministère de L'Écologie et du Développement Durable, 2002§<sup>1</sup>).

France was making progress in solving its most serious ecological problems. The annual review of environmental quality in France, which was set up by the French Environmental Institute (IFEN), highlighted a range of issues for which improvements were needed, such as air quality in many towns and the disposal of household wastes. The IFEN identified water pollution by nitrates as the most significant problem because of intensive animal farming, especially in the northern part of the country. France was warned by the European Commission (EC) to improve its record on nitrate pollution or face possible legal action at the European Court of Justice (Keil, 2002§).

France is noted for using nuclear energy, which results in less greenhouse gases. This use, however, has created other environmental concerns. The country's lack of fossil fuel resources paradoxically has made France rely on cleaner energy sources. France announced an extensive 10-year plan to curb its carbon emissions to meet its commitments under the Kyoto Protocol—one of the first countries to do so (U.S. Energy Information Administration, 2003§).

### Production

Metal and mineral industries generally maintained production and other activities at about the same or slightly decreased rates compared with those of 2002. Several industries, such as bauxite, coal, iron ore, and uranium, have steadily undergone changes during the past few years; this was especially true for iron ore, which was no longer mined. Some bauxite waste dumps in the Languedoc region were reprocessed; the resulting product was used by cement companies to correct alumina and the iron content of cement.

The coal industry, along with other mineral producers, was affected by cheaper foreign sources, high operating costs, and depletion of domestic resources. Coal mining was directed by the state-owned company Charbonnages de France (CdF).

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<sup>1</sup>References that include a section mark (§) are found in the Internet References Cited section.

The uranium industry reduced its operations by closing a number of mines and processing plants because of low market prices and depletion of certain deposits. One factor in the drop of uranium demand was the increased accessibility of petroleum and natural gas from the North Sea and the former Soviet Union (table 1). Some selected indices of production in terms of value are listed in table 2.

## Trade

In general, EU agreements and practices determine France's trade policies. France has a tradition of highly centralized administrative oversight of its essentially market based economy. Strong commercial relations continued between France and the United States, and Germany remained France's largest export destination. The United States export/import trade with France is listed in table 3. France was the ninth largest trading partner of the United States worldwide and the third largest trading partner in Europe after the United Kingdom and Germany and had the world's fifth largest industrial market. Although growth slowed in concert with other EU countries, France continued with its economic expansion. France accounted for more than 5% of the world's gross domestic product (GDP), which made its GDP fourth largest after the United States, Japan, and Germany (U.S. Census Bureau, 2002§).

In 2002, the GDP was \$1.4 trillion in purchasing power parity with an annual GDP growth rate of 1.0%. In 2001 (the latest year for which data were available) exports of goods and services totaled 28% of the GDP; imports of goods and services, 26%; and trade in goods, 49% (World Bank Group, 2003§).

## Structure of the Mineral Industry

Government and private companies produced minerals and mineral products, conducted research, and explored for new domestic and international mineral resources. Adjustment to the single European market resulted in mergers, closures of operations, and cooperative ventures as companies sought ways to obtain competitive advantages (table 4).

## Commodity Review

### Metals

**Aluminum.**—After a brief lull in 2001, the aluminum industry resumed the process of consolidation in 2002. Norsk Hydro A/S was proceeding with the acquisition of VAW Aluminium A.G. If this happens, then Norsk Hydro would eclipse the Pechiney Group as Europe's biggest aluminum company. Pechiney stated that it would be interested in acquiring the flexible packaging businesses of VAW after Norsk announced that it was selling it (Metal Bulletin, 2002).

Pechiney announced that it was dividing its aluminum operations into two distinct business sectors—primary aluminum and aluminum conversion. The primary aluminum sector will contain all the Group's bauxite, alumina, and aluminum production businesses, as well as its ferroalloy operations. The aluminum conversion sector will contain Pechiney's rolled-product, extrusion, and cast-alloy businesses. The new organization will reflect Pechiney's business-based strategy, and the two sectors will represent distinct areas of activity that operate in different industrial environments and markets (Mining Journal, 2002).

Pechiney signed an agreement to buy the aluminum-processing business of the Anglo-Dutch steel producer Corus plc for €750 million (\$885 million); this included debt assumed with the assets. Pechiney will also assume pension liabilities of €48 million (\$56 million). Corus had announced earlier that it intended to dispose of its aluminum business, because it was a noncore asset (Mining Magazine, 2002).

Pechiney announced plans to close its primary aluminum smelter at Auzat. The company said that the plant, which had a capacity of 44,000 metric tons per year (t/yr), had problems because of its small size, old technology, and remote location. The planned shutdown was the second in the metals industry in the wake of a decision by Métaleurop S.A. to shut its lead and zinc plant at Noyelles-Godault in January 2003 (Yahoo Inc., 2003§).

**Gold.**—Gold mining in France was mostly concentrated in Société des Mines du Bourneix's open pit and underground operations south of Limoges in the Saint Yrieix la Perche District and Mines d'Or de Salsigne's underground Salsigne Mine near Carcassonne. The Salsigne Mine remained closed at yearend.

**Iron and Steel.**—Aceralia S.A. of Spain, Acieries Reunies de Burbach-Eich-Dudelang (ARBED) of Luxembourg, and the Usinor Group of France merged their businesses and specialities in February 2002. The new company Arcelor S.A. was the world's leading steel group, ahead of Nippon Steel Corp. of Japan. It will have the capacity to produce 46 million metric tons per year (Mt/yr) of liquid steel at an annual sales volume of about \$30 billion. Arcelor will focus its activities on flat carbon steel products, long carbon steel products, stainless steel products, and distribution, processing, and trading (Hoovers, 2003§).

CFF Recycling S.A. (CFF) was France's largest scrap processor. The company was involved in metallic-materials processing. The collection, sorting, processing, beneficiation, and recycling of used products and waste from production was based on iron and nonferrous metals. CFF had 103 metal-processing (ferrous and nonferrous) sites in France. It crushed about 5 Mt/yr of ferrous scrap and 500,000 t/yr of nonferrous metals, such as aluminum and copper. Scrap iron and cast iron recycling accounted for 54% of the CFF's \$1 billion fiscal revenue in 2002. Nonferrous metals and refining accounted for 42%, and services and miscellaneous, 4% (Yahoo Inc., 2002a§).

**Lead and Zinc.**—Mining of lead and zinc completely ceased in France. Métaeurop announced that it was withdrawing all future funding for its Noyelles-Godault plant. The decision came less than 6 months after the company announced that it would withdraw from primary zinc production and that Noyelles-Godault would be converted into a zinc recycling plant. The proposed restructuring would have cost €50 million (\$58 million). The company stated that it did not have sufficient resources to give new funding to the plant (Mining Journal, 2003).

### *Industrial Minerals*

**Cement.**—Lafarge S.A. and Société des Ciment Français were the two largest producers of cement in France. Lafarge, which was founded in 1833, was first worldwide in cement and roofing, second worldwide in aggregates and concrete, and third worldwide in gypsum (Lafarge S.A., 2002§).

**Gypsum.**—France was one of Europe's largest producers of gypsum. Two-thirds of the production was from the Paris Basin. Of the companies, that produced about 95% of the output, S.A. de Matériel de Construction was the largest.

**Potash.**—Mines de Potasse d'Alsace S.A. (MDPA) was the principal producer of potash in the Alsace-Haut-Rhin Potassium Basin. MDPA scheduled the final phaseout of potash mining for April 2003; mining at the Amélie Mine, however, was permanently halted in September 2002 following a fire in the storage facility of La Société StocaMine. Mining at the Berrwiller Mine, which was located close to the Amélie operations, was closed in June 2001, after being reduced to one working face. Postmining programs, which included disposing of property and remediation and enhancing the environment, was expected to continue through 2009 (EMC Group, 2002§).

### *Mineral Fuels*

France has few indigenous energy sources, only small amounts of coal, natural gas, and petroleum. The exploitation of these resources has steadily decreased during the past two decades, and nuclear power has dominated the energy supply sector. French energy policy has been relatively consistent with such main objectives as securing energy supply, achieving international competitiveness, and protecting the environment. The focus on energy security has led France to become one of the world's top producers and consumers of nuclear power.

**Coal.**—CdF was proceeding with further rationalizations that would result in reduced production and closure of mines. Except for mines in the Centre-Midi Basin (lignite) and the Lorraine Basin (anthracite), all other mines were closed by yearend 2001. All mines were to be shut down by 2005 (Alexander's Gas and Oil Connections, 2003§).

The EC authorized France to pay almost €1 billion (\$1.1 billion) to its coal industry in 2002. The EC authorized the following financial measures: €303.4 million (\$351.9 million) of aid to reduce activity, which was intended to bridge the gap between the cost of producing coal and its sale price, and €92.4 million (\$789 million) of aid to cover exceptional costs not relating to current production, such as inherited liabilities (Europa, 2002§).

**Natural Gas and Petroleum.**— Because of its limited natural gas resources (506 billion cubic feet as of January 2003), France imported almost all the natural gas that it consumed. Natural gas consumption was estimated to have been 1.48 trillion cubic feet in 2001. The natural gas industry was run by Gaz de France (GdF), which was the state-held company and has a monopoly on importation and distribution of natural gas. By 2003, GdF planned to possess sufficient reserves to produce 15% of the natural gas it sells. GdF also had the largest underground storage capacity (318 billion cubic feet) in Western Europe; this was equivalent to a 3-month supply (U.S. Energy Information Administration, 2003§).

Increasingly strict EU environmental regulations for refineries resulted in recent upgrades in the French refining sector. The regulations will become considerably stricter in 2005, and substantial investment in the refining sector will be necessary to meet these new mandatory targets. France was a net importer of petroleum products (U.S. Energy Information Administration, 2003§).

Companies that operated refineries in France included BP Amoco plc, Exxon Mobil Corp., the Royal Dutch/Shell Group, and TotalFinaElf S.A., as well as other smaller companies. The structure of the industry was geared to gasoline production. France's crude oil refining capacity was 1.9 million barrels per day. France's largest refining complex was TotalFinaElf's Normandy refinery at Gonfreville, which had a capacity of 323,643 barrels per day (U.S. Energy Information Administration, 2003§).

TotalFinaElf initiated a €120 million (\$139 million) major works program at the Normandy refinery. As part of the program, €80 million (\$92 million) will be allocated to modernization investment, and €40 million (\$46 million), to maintenance work. The investment was intended to fulfill the following objectives: adapting the refining plants to the latest European specifications for low-sulfur fuels, increasing the safety of the plants operation, and minimizing the plant's impact on the environment (TotalFinaElf Group, 2002§).

**Nuclear Energy and Uranium.**—Compagnie Générale des Matières Nucléaires (COGEMA), which was the state-owned uranium mining company, was the major producer of uranium. France was the world's largest per-capita nuclear power generator and ranked second in total installed nuclear capacity after the United States. About 75% of electricity generated in France came from 57 nuclear plants. This changed dramatically since 1973 when fossil fuels accounted for more than 80% of power generation. France faced

choice of replacing obsolete nuclear plants with more modern plants or phasing out nuclear power generation (U.S. Energy Information Administration, 2002).

The U.S. International Trade Commission (ITC) gave final approval to import duties that totaled more than 32% on shipments of more than \$200 million worth of nuclear powerplant fuel. France was one of the biggest of the suppliers of enriched uranium to the U.S. market. The EU was expected to challenge the decision at the World Trade Organization on any antidumping and countervailing duties imposed (Yahoo Inc., 2002b§).

The Government had planned to have nuclear power reach 100% of electricity generation. Environmental objections, however, increased, and public opinion polls showed that a growing percentage of the public favored an end to nuclear power. The Government organized a national energy policy debate, which will focus on energy sources for the next 30 years, particularly the status of nuclear power and the future of renewables. France was the world's largest nuclear power generator on a per-capita basis and ranked second behind the United States in total installed capacity (Alexander's Gas & Oil Connections, 2003§).

France was one of the few countries in the world with a nuclear-reprocessing plant. COGEMA's La Hague facility received authorization from the Nuclear Installation Safety Directorate to start operating two new facilities that would compact hull and end-pieces and purify plutonium (U.S. Energy Information Administration, 2003§).

**Renewable Energy.**—Electricité de France (EDF) operated a power generation system that was largely based on hydropower, nuclear power, and other renewable sources, which included biomass, geothermal, and wind. EDF, which had a hydropower base of 44.1 terrawatt hours, was one of the leading renewable energy producers in Europe and the largest in France. With the intent to control from 20% to 30% of the wind-power market, EDF started construction of 20-megawatt (MW)-capacity wind-powered units in the Vendée region and had the 2.2-MW-capacity Petit François site in Guadeloupe operational. Between 30 and 50 MW are scheduled to come onstream in 2003 (Electricité de France, 2002§).

## Outlook

Having one of the world's most developed economies, France has been an advocate for the EU and the European single-market concept. The country has had to make considerable changes in the structure of its industries, particularly those mineral industries controlled by the State. Some state-owned companies, such as EDF, have taken the initiative to become leaders in their respective industries. Others have been forced to make additional adjustments under rationalization schemes proposed by either the EU or the French Government. The depletion of mineral resources and/or the cessation of subsidies for uneconomic operations have had impacts on local communities and their economies. France has the advantage of plentiful electrical power to attract industrial facilities that require skilled work forces and good access to markets in Europe. If nuclear power is phased out, then imports of oil and gas will be required to supplement power production from wind farms.

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## **Major Sources of Information**

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DGEMP SMPSS  
101 Rue de Grenelle  
75353 Paris, France

TABLE 1  
FRANCE: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, unless otherwise specified)

| Commodity <sup>2</sup>                            | 1998                 | 1999                 | 2000                 | 2001                | 2002 <sup>e</sup>    |
|---|----------------------|----------------------|----------------------|---------------------|----------------------|
| <b>Metals:</b>                                    |                      |                      |                      |                     |                      |
| <b>Aluminum:</b>                                  |                      |                      |                      |                     |                      |
| Bauxite, gross weight <sup>3</sup> thousand tons  | 165 <sup>e</sup>     | 160                  | 185                  | 153                 | 160                  |
| <b>Alumina:</b>                                   |                      |                      |                      |                     |                      |
| Crude do.   | 570 <sup>e</sup>     | 550                  | 500                  | 600                 | 600                  |
| Calcined do.                                      | 450 <sup>e</sup>     | 450                  | 462                  | 480                 | 500                  |
| <b>Metal:</b>                                     |                      |                      |                      |                     |                      |
| Primary do.                                       | 424                  | 455                  | 441                  | 462                 | 463 <sup>4</sup>     |
| Secondary do.                                     | 240 <sup>e</sup>     | 239                  | 260                  | 253                 | 262 <sup>4</sup>     |
| Antimony, metal, including regulus <sup>e</sup>   | 600                  | 500                  | 500                  | 500                 | 500                  |
| Cadmium metal                                     | 223                  | 195                  | 160                  | 176                 | 154 <sup>4</sup>     |
| <b>Cobalt, metal:</b>                             |                      |                      |                      |                     |                      |
| Powder <sup>e</sup>                               | 600                  | 600                  | 600                  | 600                 | 500                  |
| Chloride  | 172 <sup>e</sup>     | 180                  | 204                  | 199                 | 175 <sup>4</sup>     |
| <b>Copper:<sup>e</sup></b>                        |                      |                      |                      |                     |                      |
| Mine output, Cu content                           | 180                  | 100                  | 100                  | --                  | --                   |
| <b>Metal, secondary:</b>                          |                      |                      |                      |                     |                      |
| Blister   | 1,079 <sup>4</sup>   | 1,000                | 1,000                | 1,000               | 1,000                |
| Refined   | 22,400               | 1,800                | 1,500                | 1,500               | 500                  |
| Gold, mine output, Au content kilograms           | 3,793                | 3,570 <sup>e</sup>   | 2,632                | 2,510               | 2,600                |
| <b>Iron and steel:</b>                            |                      |                      |                      |                     |                      |
| <b>Iron ore and concentrates:</b>                 |                      |                      |                      |                     |                      |
| Gross weight thousand tons                        | 100                  | --                   | --                   | --                  | --                   |
| Fe content do.                                    | 28                   | --                   | --                   | --                  | --                   |
| <b>Metal:</b>                                     |                      |                      |                      |                     |                      |
| Pig iron  | 13,603               | 13,854               | 13,661               | 12,004              | 13,217 <sup>4</sup>  |
| <b>Ferroalloys:<sup>e</sup></b>                   |                      |                      |                      |                     |                      |
| Blast furnace, spiegeleisen and ferromanganese    | 321                  | 302 <sup>4</sup>     | 300                  | 300                 | 300                  |
| <b>Electric furnace:</b>                          |                      |                      |                      |                     |                      |
| Ferromanganese <sup>e</sup> thousand tons         | 100                  | 138 <sup>4</sup>     | 140                  | 130                 | 130                  |
| Ferrosilicon do.                                  | 110                  | 100                  | 110                  | 100                 | 100                  |
| Silicon metal do.                                 | 65                   | 65                   | 60                   | 65                  | 65                   |
| Other (Si, Ca, Mg) do.                            | 95                   | 100                  | 100                  | 100                 | 100                  |
| Total do.   | 691                  | 705                  | 710                  | 695                 | 695                  |
| <b>Steel:</b>                                     |                      |                      |                      |                     |                      |
| Crude do.   | 20,241               | 20,211               | 21,002               | 19,431              | 20,524 <sup>4</sup>  |
| Hot rolled do.                                    | 16,822               | 17,294               | 17,722               | 16,593 <sup>r</sup> | 16,600               |
| <b>Lead:</b>                                      |                      |                      |                      |                     |                      |
| Smelter, secondary <sup>e</sup>                   | 208,000              | 205,000 <sup>4</sup> | 209,000 <sup>4</sup> | 132,000             | 130,000              |
| <b>Refined:</b>                                   |                      |                      |                      |                     |                      |
| Primary   | 146,000 <sup>e</sup> | 124,000 <sup>e</sup> | 109,868              | 98,257              | 84,000               |
| Secondary   | 172,000              | 155,000 <sup>e</sup> | 158,226              | 143,338             | 112,000              |
| Total   | 318,000              | 279,000 <sup>e</sup> | 268,094              | 241,595             | 196,000              |
| Magnesium metal, including secondary <sup>e</sup> | 14,700 <sup>4</sup>  | 16,200               | 16,500               | 4,000 <sup>5</sup>  | --                   |
| Nickel metal <sup>6</sup>                         | 9,778                | 9,458                | 10,100               | 11,033              | 11,100               |
| <b>Silver:<sup>e</sup></b>                        |                      |                      |                      |                     |                      |
| Mine output, Ag content kilograms                 | 1,027 <sup>4</sup>   | 1,140                | 720 <sup>4</sup>     | 800                 | 600                  |
| Metal, Ag content of final smelter products do.   | 550                  | 500                  | 500                  | 450                 | 400                  |
| Tin, secondary                                    | 2,926                | 1,506                | 1,257                | 1,644               | 1,600                |
| Tungsten powder <sup>e</sup>                      | 600                  | 500                  | 500                  | 500                 | 500                  |
| Zinc metal, including slab and secondary          | 329,019              | 331,103              | 347,705              | 343,805             | 338,924 <sup>4</sup> |

See footnotes at end of table.

TABLE 1--Continued  
FRANCE: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, unless otherwise specified)

| Commodity <sup>2</sup>                                       | 1998                | 1999               | 2000               | 2001               | 2002 <sup>c</sup> |
|--|---------------------|--------------------|--------------------|--------------------|-------------------|
| <b>Industrial minerals:</b>                                  |                     |                    |                    |                    |                   |
| Barite, BaSO <sub>3</sub> equivalent                         | 75,000 <sup>e</sup> | 76,000             | 91,000             | 81,000             | 80,000            |
| Bromine, elemental <sup>c</sup>                              | 2,000               | 8,000              | 7,900 <sup>4</sup> | 7,800              | 6,000             |
| Cement, hydraulic thousand tons                              | 19,737              | 19,257             | 20,191             | 19,839             | 20,000            |
| <b>Clays:</b>  |                     |                    |                    |                    |                   |
| Kaolin and kaolinitic clay (marketable) thousand tons        | 333 <sup>e</sup>    | 330                | 380                | 375                | 360               |
| Refractory clay, unspecified do.                             | 14 <sup>e</sup>     | 14                 | 12                 | 14                 | 15                |
| Diamonds, synthetic, industrial <sup>c</sup> thousand carats | 3,600               | 3,600              | 3,600              | 3,600              | 3,600             |
| Diatomite <sup>c</sup> thousand tons                         | 80                  | 75                 | 75                 | 85                 | 80                |
| Feldspar, crude <sup>c</sup> do.                             | 706                 | 638                | 642 <sup>4</sup>   | 650                | 650               |
| <b>Fluorspar:</b>  |                     |                    |                    |                    |                   |
| Crude do.  | 250                 | 250                | 250                | 250                | 250               |
| <b>Marketable:</b>   |                     |                    |                    |                    |                   |
| Acid- and ceramic-grade do.                                  | 85 <sup>e</sup>     | 86                 | 85                 | 95                 | 95                |
| Metallurgical grade do.                                      | 20 <sup>e</sup>     | 20                 | 20                 | 20                 | 10                |
| Total do.  | 105                 | 106                | 105                | 115                | 105               |
| Gypsum and anhydrite, crude <sup>c</sup> do.                 | 4,500               | 4,500              | 4,500              | 4,500              | 4,500             |
| Kyanite, andalusite, related materials <sup>c</sup> do.      | 70                  | 70                 | 65                 | 65                 | 65                |
| Lime, quick and hydrated, dead-burned dolomite do.           | 3,106               | 3,094              | 3,000 <sup>e</sup> | 3,000 <sup>e</sup> | 3,000             |
| Mica <sup>c</sup>  | 10,000              | 10,000             | 10,000             | 10,000             | 10,000            |
| Nitrogen, N content of ammonia thousand tons                 | 1,570 <sup>e</sup>  | 1,580              | 1,620              | 1,580              | 1,050             |
| Pigments, mineral, natural, iron oxide <sup>c</sup>          | 2,000               | 1,500              | 1,500              | 1,000              | 1,000             |
| Phosphates, Thomas slag thousand tons                        | 50 <sup>e</sup>     | 50                 | 50                 | 50                 | 50                |
| Potash, K <sub>2</sub> O equivalent (marketable) do.         | 453                 | 345                | 321                | 257                | 130               |
| Pozzolan and lapilli <sup>c</sup> do.                        | 460                 | 450                | 450                | 400                | 400               |
| <b>Salt:</b>   |                     |                    |                    |                    |                   |
| Rock salt do.  | 300 <sup>e</sup>    | 100 <sup>e</sup>   | 386                | 596                | 500               |
| Brine salt, refined do.                                      | 1,500 <sup>e</sup>  | 1,730              | 1,774              | 1,727              | 1,700             |
| Marine salt <sup>c</sup> do.                                 | 1,200               | 900                | 1,000              | 1,000              | 1,000             |
| Salt in solution do.   | 4,000 <sup>e</sup>  | 4,057 <sup>r</sup> | 3,956              | 3,774              | 3,800             |
| Total do.  | 7,000 <sup>e</sup>  | 6,787              | 7,116 <sup>r</sup> | 7,097 <sup>r</sup> | 7,000             |
| <b>Sodium compounds:<sup>c</sup></b>                         |                     |                    |                    |                    |                   |
| Soda ash   | 1,000               | 1,000              | 1,000              | 1,000              | 1,000             |
| Sodium sulfate   | 120                 | 120                | 120                | 120                | 120               |
| <b>Stone, sand and gravel:<sup>c</sup></b>                   |                     |                    |                    |                    |                   |
| Limestone, agricultural and industrial                       | 11,000              | 11,000             | 12,000             | 12,000             | 12,000            |
| Slate, roof  | 30                  | 30                 | 30                 | 30                 | 30                |
| <b>Sand and gravel:</b>                                      |                     |                    |                    |                    |                   |
| Industrial sands   | 6,500               | 6,500 <sup>e</sup> | 5,359              | 5,062              | 5,000             |
| Other sand, gravel, and aggregates                           | 165,000             | 165,000            | 181,020            | 172,764            | 170,000           |
| <b>Sulfur, byproduct:<sup>c</sup></b>                        |                     |                    |                    |                    |                   |
| Of natural gas   | 600 <sup>4</sup>    | 600                | 500                | 550                | 500               |
| Of petroleum   | 245 <sup>4</sup>    | 250                | 150                | 150                | 150               |
| Of unspecified sources                                       | 261 <sup>4</sup>    | 250                | 150                | 150                | 150               |
| Total  | 1,106 <sup>4</sup>  | 1,100              | 800                | 850                | 800               |
| <b>Talc:</b>   |                     |                    |                    |                    |                   |
| Crude  | 391,000             | 405,300            | 376,000            | 367,000            | 370,000           |
| Powder <sup>c</sup>  | 300,000             | 300,000            | 300,000            | 300,000            | 300,000           |
| <b>Mineral fuels and related materials:</b>                  |                     |                    |                    |                    |                   |
| Asphaltic material <sup>c</sup>                              | 24,000              | 24,000             | 24,000             | 25,000             | 20,000            |
| Carbon black <sup>c</sup>                                    | 250,000             | 250,000            | 250,000            | 250,000            | 200,000           |
| <b>Coal, including briquets:</b>                             |                     |                    |                    |                    |                   |
| Anthracite and bituminous thousand tons                      | 5,300               | 4,033              | 3,805              | 2,364              | 1,900             |
| Lignite do.  | 800                 | 894                | 297                | 324                | 300               |
| Total do.  | 6,100               | 4,927              | 4,102              | 2,688              | 2,200             |
| Briquets <sup>c</sup> do.                                    | 250                 | 163 <sup>4</sup>   | 200                | 200                | 175               |

See footnotes at end of table.

TABLE 1--Continued  
FRANCE: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, unless otherwise specified)

| Commodity <sup>2</sup>   | 1998                 | 1999    | 2000    | 2001                 | 2002 <sup>e</sup> |
|--|----------------------|---------|---------|----------------------|-------------------|
| Mineral fuels and related materials--Continued:                |                      |         |         |                      |                   |
| Coke, metallurgical <sup>e</sup> thousand tons                 | 4,000                | 5,312   | 5,327   | 5,091                | 5,000             |
| Gas, natural, marketed <sup>e</sup> million cubic meters       | 2,600                | 2,500   | 1,873   | 1,810                | 1,850             |
| Petroleum:   |                      |         |         |                      |                   |
| Crude                      thousand 42-gallon barrels          | 13,000               | 13,380  | 11,591  | 10,082               | 10,000            |
| Refinery products:   |                      |         |         |                      |                   |
| Liquefied petroleum gas                      do.               | 34,000 <sup>e</sup>  | 29,012  | 30,937  | 29,000 <sup>e</sup>  | 29,000            |
| Gasoline, all kinds                      do.                   | 145,000 <sup>e</sup> | 146,855 | 132,107 | 140,000 <sup>e</sup> | 140,000           |
| Kerosene and jet fuel                      do.                 | 54,000 <sup>e</sup>  | 52,948  | 48,872  | 48,800 <sup>e</sup>  | 48,800            |
| Distillate fuel oil                      do.                   | 260,000 <sup>e</sup> | 238,451 | 250,417 | 250,000 <sup>e</sup> | 250,000           |
| Residual fuel oil                      do.                     | 76,000 <sup>e</sup>  | 59,121  | 57,776  | 69,000 <sup>e</sup>  | 69,000            |
| Other products                      do.                        | 100,000 <sup>e</sup> | 46,872  | 46,179  | 45,000 <sup>e</sup>  | 45,000            |
| Refinery fuel                      do.                         | 1,000 <sup>e</sup>   | 868     | 1,148   | 1,200 <sup>e</sup>   | 1,200             |
| Total                      do.                                 | 670,000 <sup>e</sup> | 574,127 | 567,436 | 583,000 <sup>e</sup> | 583,000           |
| Uranium:   |                      |         |         |                      |                   |
| Mine output, U content   | 468                  | 625     | 318     | 182                  | 175               |
| Chemical concentrate, U <sub>3</sub> O <sub>8</sub> equivalent | 453                  | 424     | 302     | 156                  | 150               |

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to total shown. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through September 2003.

<sup>2</sup>In addition to the commodities listed, France produces germanium from domestic ores. Unfortunately, actual output is not regularly reported. France also produces large amounts of stone, but statistics on output are not available.

<sup>3</sup>Reprocessed bauxite not for metallurgical use.

<sup>4</sup>Reported figure.

<sup>5</sup>Plant closed in June 2001.

<sup>6</sup>Excludes secondary production from nickel/cadmium batteries.

TABLE 2  
FRANCE: SELECTED INDICES OF PRODUCTION

(1995 = 100)

| Sector              | 1998  | 1999  | 2000  | 2001  | 2002  |
|---------------------|-------|-------|-------|-------|-------|
| General             | 110.1 | 112.3 | 116.3 | 117.6 | 116.4 |
| Mining              | 88.8  | 89.8  | 91.3  | 89.5  | 84.5  |
| Manufacturing       | 111.6 | 113.7 | 117.8 | 118.8 | 117.4 |
| Electricity and gas | 102.8 | 105.2 | 108.6 | 112.2 | 112.1 |

Source: United Nations, 2003, Monthly Bulletin of Statistics, v. LVII, no. 984, June, p. 16.

TABLE 3  
FRANCE: EXPORT AND IMPORT TRADE WITH THE UNITED STATES IN 2001

(Million dollars)

| Month              | Exports | Imports |
|--------------------|---------|---------|
| January            | 1,642   | 2,525   |
| February           | 1,972   | 2,344   |
| March              | 2,042   | 3,309   |
| April              | 1,610   | 2,734   |
| May                | 1,687   | 2,612   |
| June               | 1,749   | 2,303   |
| July               | 1,233   | 2,629   |
| August             | 1,404   | 2,364   |
| September          | 1,613   | 1,873   |
| October            | 1,700   | 2,714   |
| November           | 1,644   | 2,469   |
| December           | 1,570   | 2,533   |
| Total <sup>1</sup> | 19,865  | 30,408  |

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

Source: U.S. Census Bureau, Foreign Trade Division, July 2001.

TABLE 4  
FRANCE: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand metric tons unless otherwise specified)

| Commodity                      |                      | Major operating companies<br>and major equity owners                                | Location of<br>facilities                                | Annual<br>capacity |
|--------------------------------|----------------------|---|--|--------------------|
| Alumina                        |                      | Aluminium Pechiney  | Plant at Gardanne  | 700                |
| Aluminum                       |                      | do.   | Aluminum smelters at:                                    |                    |
| Do.                            |                      | do.   | Saint-Jean-de-Maurienne, Savoie Province                 | 120                |
| Do.                            |                      | do.   | Noguères, Pyrénées, Atlantiques Province                 | 115                |
| Do.                            |                      | do.   | Lannemezan, Hautes-Pyrénées Province                     | 63                 |
| Do.                            |                      | do.   | Auzat, Ariège Province                                   | 44                 |
| Andalusite                     |                      | Denain-Anzin Minéraux Refractaire Ceramique   | Glomel Mine, Brittany                                    | 75                 |
| Antimony, metal                |                      | Société Nouvelle des Mines de la Lucette  | Plant at Le Genest, Mayeene Province                     | 10                 |
| Barite                         |                      | Barytine de Chaillac  | Mine and plant at Chaillac, Indre Province               | 150                |
| Do.                            |                      | Société Industrielle du Centre  | Mine at Rossigno, Indre Province                         | 100                |
| Cadmium                        | metric tons          | Compagnie Royal Asturienne des Mines  | Plant at D'Auby-les-Douai, Nord Province                 | 200                |
| Cement                         |                      | Eight companies, the largest of which are:  | 80 plants, including:                                    | 23,233             |
| Do.                            |                      | LaFarge S.A.  | 15 plants; largest at St. Pierre-la-Cour (1,160)         | 7,815              |
| Do.                            |                      | Société des Ciments Français  | 13 plants; largest at Gargenville (1,100)                | 6,190              |
| Coal                           |                      | Charbonnages de France (CdF) including:   |  |                    |
| Do.                            |                      | Centre-Midi Bassin  | Open pit mines in western France                         | 1,000              |
| Do.                            |                      | Lorraine Bassin   | Underground mines in eastern France                      | 2,500              |
| Cobalt, metal                  | metric tons          | Société Métallurgique le Nickel (SLN)   | Plant at Sandouville, near Le Havre                      | 600                |
| Copper, metal                  |                      | Compagnie General d'Electrolyse du Palais   | Electrolytic plant at Palais-sur-Vienne                  | 45                 |
| Do.                            |                      | Société Française d'Affinage du Cuivre  | Smelter at Poissy, Yvelines                              | 11                 |
| Diatomite                      |                      | Ceca S.A.   | Mines and plants at Riom-les-Montagne<br>and St. Bazille | 100                |
| Feldspar                       |                      | Denain-Anzin Minéraux S.A.  | Mine and plant at St. Chély d' Apcher                    | 55                 |
| Ferroalloys                    |                      | Société du Ferromanganese de Paris, Outreau   | Plant at Boulogne-sur-Mer                                | 420                |
| Do.                            |                      | Pechiney Electrometallurgie   | Plants at Bellegarde                                     | 387                |
| Do.                            |                      | Chromeurop S.A.   | Plant at Dunkerque                                       | 25                 |
| Fluorspar                      |                      | Société Générale de Recherches et d'Exploitation<br>Minière (SOGEREM)               | Mines in southern France                                 | 150                |
| Gold                           | kilograms            | Société des Mines du Bourneix (Government)  | Mines in the Saint Yrieix la Perche District             | 4,000              |
| Do.                            | do.                  | Mines d'Or de Salsigne (Eltin Co., 51%;<br>Ranger Co., 18%; Peter Hambro Plc., 10%) | Mine near Carcassonne (closed)                           | 3,000              |
| Gypsum                         |                      | S.A. de Materiel de Construction  | Mine at Taverny  | 1,500              |
| Iron and steel:                |                      |   |  |                    |
| Steel                          |                      | Usinor Group  | Dunkerque  | 7,500              |
| Do.                            |                      | do.   | Fos-sur-Mer  | 4,200              |
| Do.                            |                      | do.   | Seramange  | 3,000              |
| Do.                            |                      | Sollac Unimetal (Usinor Group, 100%)  | Gadrange, Neuves Maisons, and Thonville                  | 8,400              |
| Kaolin                         |                      | La Source Compagnie Minière   | Kaolin d'Arvor Mine, Quessoy                             | 300                |
| Lead, metal                    |                      | Métaleurop S.A.   | Plant at Noyelles Godault                                | 165                |
| Magnesium, metal               |                      | Péchiney Electrometallurgie   | Plant at Marignac (closed 2002)                          | 15                 |
| Natural gas                    | million cubic meters | Société Nationale Elf Aquitaine (SNEA)  | Gasfield and plant at Lacq                               | 20,000             |
| Nickel, metal                  |                      | Société Metallurgia le Nickel (SLN)   | Plant at Sandouville                                     | 16                 |
| Nitrogen, N content of ammonia |                      | Grande Paroisse S.A.  | Plant at Grandpuits                                      | 390                |
| Petroleum:                     |                      |   |  |                    |
| Crude                          | barrels per day      | Société National Elf Aquitaine (SNEA)   | Paris Basin oilfields                                    | 1,000              |
| Refined                        | do.                  | TotalFinaElf S.A.   | Refineries at Gonfreville and La Mede                    | 446,000            |
| Do.                            |                      | Shell-Française   | Refinery at Petite Couron                                | 285,000            |
| Do.                            |                      | do.   | Refinery at Berre  | 270,000            |
| Do.                            |                      | Elf Aquitaine-France  | Refinery at Feyzin                                       | 120,000            |
| Do.                            |                      | do.   | Refinery at Donges                                       | 200,000            |
| Do.                            |                      | do.   | Refinery at Grandpuits                                   | 96,000             |
| Do.                            |                      | Société Française British Petroleum (S.F.B.P.)                                      | Refineries at Lavera                                     | 175,000            |
| Do.                            |                      | Esso S.A.   | Refineries at Fos-sur-Mer                                | 237,000            |
| Do.                            |                      | Mobil Oil Française   | Refineries at Gravenchon                                 | 62,000             |
| Do.                            |                      | Cie. Rhenane de Raffinage (CRR)   | Refinery at Reichstett                                   | 80,000             |

TABLE 4--Continued  
FRANCE:STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand metric tons unless otherwise specified)

| Commodity                              |             | Major operating companies<br>and major equity owners               | Location of<br>facilities                  | Annual<br>capacity |
|--|-------------|--|--|--------------------|
| Potash, K <sub>2</sub> O               |             | Mines de Potasse d'Alsace S.A. (MDPA)                              | Mines at Amélie and Marie-Louise (closed)  | 2,500              |
| Salt, rock                             |             | Compagnie des Salins du Midi et des<br>Salines de l'Est            | Varangeville Mine at Saint-Nicolas-de-Port | 9,000              |
| Sulfur                                 |             | Société Nationale Elf Aquitaine (SNEA)                             | Byproduct from natural gas, Lacq plant     | 3,000              |
| Talc                                   |             | Talc de Luzenac S.A. (Rio Tinto Corp., 100%)                       | Trimouns Mine near Ariège, Pyrenees        | 350                |
| Uranium, U <sub>3</sub> O <sub>8</sub> | metric tons | Compagnie Général des Matières Nucléaires<br>(COGEMA) (Government) | Mines at Limousin, Vendee, and Hérault     | 1,800              |
| Zinc, metal                            |             | Umicore Group  | Plant at Auby-les-Douai                    | 220                |
| Do.                                    |             | Métaleurop S.A.  | Plant at Noyelles Godault                  | 110                |