

# THE MINERAL INDUSTRY OF FRANCE

By Harold R. Newman

France is one of the major European mineral producers. The traditional mineral industries in France have been in a state of transition during the past few years. In the past, the heavy involvement of the state, both economically and politically, was one of the main elements of the French mineral policy. Reduction of Government subsidies supporting uneconomic mineral operations and the depletion of mineral reserves have had a significant impact on a number of extractive operations in the French mineral industry. Efforts have been made to promote the private sector and to reduce the dependence of state-owned companies on subsidies.

In an effort to encourage exploration within the country, the mining code was modified in July 1994 by a law that established clearer, expedited rules to allocate surveying and mining licenses.

The Government was proceeding with a privatization program involving large state-controlled companies. Included among those privatized were Pechiney, Rhône-Poulenc, Société Nationale Elf Aquitaine (SNEA), Usinor-Sacilor, and Bureau de Recherches Géologiques et Minière (BRGM).

BRGM's French and international mining interests were merged with a private mining group, Normandy Poseidon of Australia, to create an international group consisting of two companies. The first, La Source Compagnie Minière, received all of BRGM's mining assets, except for gold assets in France and abroad, nickel assets in New Caledonia, and manganese assets in Gabon. The second, Compagnie Internationale Or S.A., received all of BRGM's gold assets. After the various companies changed assets, BRGM became a 9% shareholder in Normandy Poseidon.

Mineral and metal industries generally maintained their production and other activities at about the same or slightly decreased rate of 1994. Several industries, such as bauxite, coal, iron ore, and uranium, have steadily undergone changes during the past few years. Bauxite was no longer mined in France.

The coal and iron ore industries were affected by cheaper foreign sources and the depletion of domestic resources. Coal mining was directed by Charbonnages de France (CdF), a state-owned company. As a result of the high cost of underground production in comparison with cheaper imported coal, CdF was maintaining its policy of investing in high-productivity mines and closing uneconomic operations.

The uranium industry reduced its operations by closing a number of mines and processing plants owing to low market prices and depletion of certain deposits. Another factor in the drop of uranium demand was the reduced cost for petroleum and the increased accessibility of natural gas from the North Sea and the former Soviet Union. Lower petroleum prices meant that fewer new nuclear plants were considered for construction, some older plants were being closed, and the export market for uranium decreased. (*See table 1.*)

The Government maintained efforts to refocus the country's trading patterns toward the Organization for Economic Co-Operation and Development countries. Strong commercial relations continued between France and the United States, while Germany remained France's largest export destination.

Table 2 shows the relationship of selected classes of mineral commodities on France's balance of payments position in relation to the European Union (EU) and the world.

Government and private companies produced minerals and mineral products, conducted research, and explored domestically and internationally for new mineral resources. Adjustments to the single European market resulted in numerous mergers, closures of operations, and co-operative ventures as companies sought ways to obtain competitive advantages. Some industries that have benefitted greatly from Government assistance in the past were affected by a Government policy aimed at reducing assistance for nonprofitable operations. Others were expanding as Government sponsored programs resulted in exploitable opportunities, such as the availability of abundant and inexpensive electrical power. (*See table 3.*)

At a reported average cost of \$1.27 per kilogram, France was considered the lowest cost aluminum-producing country in Europe. The main reasons were lower energy costs and advanced technology.

Privatization of Pechiney was completed in 1995. Transfers involved a 21% share in the Carbone Lorraine Group going to Paribas SA of Brazil, the metal package company in the United States going to Silgan Corp., the glass package company in the United States going to the Saint Gobain Group of France, and the Howmet group to Carlyle and Thiokol Corp. of the United States.

Société Européen d'Alliages pour la Siderurgie's (SEAS) new 110,000 tons per year (t/yr) high-carbon ferromanganese and silicomanganese plant was in operation at yearend. The plant, on a 23-hectare (ha) site in Dunkerque, was employing

modern submerged-arc-furnace technology and utilizing relatively low-cost power from the nearby Graveslines nuclear power station. Most of SEAS's output was expected to be used internally in Usinor's steelmaking operations.

Gold mining in France was mostly concentrated in Société des Mines du Bourneix's operations in the Saint-Yrieix la Perche District south of Limoges and Mines et Cyanurations de Salsigne's Salsigne Mine near Carcassonne. Both companies have underground and small open pit operations with Bourneix producing about 2 t/yr of gold and Salsigne producing about 2.5 t/yr.

The famous iron ore basin of northern France stretched from Lorraine, France, northward into Belgium. However, for many years, the high phosphorus and relatively low iron content of the ore limited its desirability. Production has been declining for several years. ARBED's mine at Terres Rouges was the only working mine left and it was expected to close at yearend 1997.

The world's third largest steel manufacturer, Usinor Sacilor, was privatized in 1995. The Usinor Sacilor group was organized into three branches. The stainless steel branch, Ugine, which was composed of Imphy and Ugine of France and J&L Co. of the United States; the steel flats branch, Sollac; and the special steels branch, Aster. The Aster branch was composed of the Unimétal, Ascotmétal, Allevard, and IMS companies. Arus, the iron and steel products marketing subsidiary, was taken over by the Klockner Group.

Compagnie Française des Ferrailles (CFF), the largest independent scrap metal processor in Europe, was maintaining its investments in shredders and joint ventures. CFF had investments in 22 shredder operations, including 1 each in Spain and Belgium and 2 in the United States. Construction of four new sites was proceeding; three are in France and one is in Spain. CFF supplied about 4 million metric tons per year of ferrous scrap, which was about 40% of the total French market.

BRGM was proceeding with exploration and development of the Chessy copper deposit. Poseidon Gold, a subsidiary of Normandy Poseidon of Australia, took over Aztec Mining Ltd.'s 24% interest in the project. Production of copper ore was scheduled to begin in early 1997; the mine operation was expected to last an estimated 14 years.

Mining of lead and zinc has ceased completely in France. Two companies operated primary zinc plants in France. The company, Société des Mines et Fonderies de Zinc de la Vieille Montagne (VM), of Belgium, operated a zinc refinery at Auby-les-Douai with an annual capacity of 210,000 t/yr of zinc. VM's electrolytic plant was reportedly the newest and most modern in Europe and was built at a cost of \$70 million in 1987. The other company, Métaleurop S.A., operated a 110,000 t/yr primary smelter and a 15,000 t/yr secondary smelter at Noyelles-Godualt. Métaleurop restarted operations in March 1995. The plant had ceased production in January 1994 following an accident.

Cogema, the state-owned uranium mining company, was the major producer of uranium in France. In recent years, the

pace of exploration has decreased and projected future ore requirements have leveled off. In fact, most projects worldwide have been halted or canceled and several mines in France were closed. The Margnac Mine in Haute Vienne closed in 1995. La Crouzille, near Limoges, was scheduled to be closed in 1996.

France has 56 nuclear reactors producing 55,778 megawatts (MW) of electricity. Six more reactors were under construction and, when completed, would furnish an additional 8,305 MW of electricity. Nuclear power reactors provided almost 75% of electricity generated in France. About 14% of production was exported to neighboring countries.

Denain-Anzin Minéraux Refractaire Ceramique (DAMREC), a subsidiary of the Imetal Group, was the only producer of andalusite in Europe. DAMREC's mining operation is at Glomel, Brittany, and produces about 75,000 t/yr. This placed France second only to South Africa in world output of andalusite. The company produced three grades of andalusite that were distinguished by different alumina and iron oxide contents. These products were sold to the refractory and ceramic industries.

The primary barite area in France is at Chaillac in central France, near Limoges. Barytine de Chaillac, a subsidiary of Solvay Barium Strontium GmbH of Germany, is the major producer with an open pit mine and plant at Chaillac. Barytine produced about 90,000 t/yr of flotation-grade barite averaging 98% barium sulfate, suitable for chemicals production.

Lafarge SA and Société Des Ciments Français were the two largest producers of cement in France. During the past several years, these two companies have been acquiring a number of companies within France as well as internationally. Each company has gained control of approximately one-third of the domestic market, leaving fewer than eight other companies holding the remaining one-third.

Société Générale de Recherches et d'Exploitations Minières (Sogerem) controlled more than 60% of fluorspar production. The fluorspar vein deposits were found in Hercynian massifs, Massif Central, the Vosges, the axial zone of the Pyrénées, and the outer Alps. Sogerem's mining operations supply Comifluor S.A. which operated a plant at Bastide-a-Olette. This plant produces acid-grade fluorspar, 97% calcium fluoride, and electrical-grade fluorspar. Total production of both grades is approximately 45,000 t/yr. The Escardo Mine, owned by Denain-Anzin Minéraux, also ships approximately 90,000 t/yr from its surface mining operation to the Olette plant.

France was one of Europe's largest producers of gypsum. Two-thirds of the production was from the Paris Basin. Four companies produced approximately 95% of the output. In recent years, France had reported increased sales of gypsum products to other European countries. SA de Matériel de Construction, the largest company, accounts for almost one-half of the total gypsum produced. The largest operation was

the 1.3-Mt/yr underground mine at Taverny.

Kaolin deposits derived from the granite massifs in Brittany were the most actively mined deposits in France. The largest mine, operated by Société Kaolinière Armoricaïne, was at Quessoy. The mine has a capacity of 120,000 t/yr. Another deposit in the northern area of Brittany was Plemet. In the southern part of the peninsula, at Ploemeur, are two operations, Société des Kaolin d'Arvor and Société Kaolins de Morbihan. Reportedly, these operations each have a capacity to produce 75,000 t/yr. Société des Kaolins du Finistère's 30,000 t/yr operation at Berrien was bought by Kaolins de Morbihan. The kaolin was used mostly in the paper and ceramics industries. Ball and refractory clays are mined in the Charante Basin to the southwest, which has been producing more than 1 Mt/yr.

Mines de Potasse d'Alsace S.A. (MDPA) was the principal producer of potash with two mines, Marie-Louise and Amélie, located near Mulhouse, Alsace. MDPA was the world's fifth largest supplier of potash salts. The main products were potash ore, which was concentrated to 62% potassium oxide material, bromine and other industrial products, and rock salt for snow clearing. About 90% of the potash production was used by agriculture for fertilizer and 10% was purified and treated for use in other industries.

Based on estimated reserves, the French deposit should last into the early part of the next century. However, future development was constrained to the east, west, and south by the boundaries of the tilted potash beds and to the north by the depth of the deposit. The mines were scheduled to close in 2004.

Talcs de Luzenac S.A. not only was significant to the domestic market, but also was Europe's largest corporate talc producer. The company has acquired several talc mining interests worldwide. Borax Français S.A., a subsidiary of RTZ Corp., subsequently purchased 92% of Talcs de Luzenac S.A. As a result, RTZ Corp. became one of the major talc producers in the world.

Talcs de Luzenac's open pit mine near Aix-les-Themes, where the company has been mining since 1905, was the largest operation in France. Production was about 300,000 t/yr of ore, from which more than 40 different grades of talc are derived. In terms of estimated reserves, the deposit, considered one of the largest in the world, could possibly support the current output for another 100 years.

All underground coal mines were closed in the Midi-Pyrénées region in southern France and in the Nord Pas-de-Calais basin. The state company, CdF, was proceeding with further rationalizations, resulting in reduced production. The mines at La Mure in the Alps and at Carmaux in the Massif Central were expected to close in 1997. The rest of the mines, except in Lorraine region, were expected to close between 1997 and 2000. The mines in Lorraine were expected to close after the year 2000. CdF envisioned the final stoppage of all coal mining in France by 2005.

In 1995, onshore petroleum production was mainly from the Paris Basin, which produced an estimated 10.5 million

barrels (Mbbbl), and the Aquitaine Basin, which produced an estimated 7 Mbbbl. Because production had started to decline in these areas, the Government was planning to initiate a program to encourage exploration for new deposits in other areas thought to have good potential. The Jura Basin was one area under consideration.

Five companies were operating refineries in France: SNEA, Total, Royal Dutch/Shell Group, British Petroleum Co. PLC, and Mobil Corp. The structure of the industry was geared to gasoline production. Refining was mainly focused on high-octane unleaded gasoline used by a majority of the vehicles in France.

No refining units have been capable of processing heavy fuels, nor were there available hydrocracked feedstocks for the production of gas oil, thus leaving the process stream short on middle distillates and naphtha. France is a net importer of petroleum products.

France has a very modern and well-developed infrastructure. The French National Railways operated 34,568 kilometers (km) of 1.435-meter standard gauge, of which 11,674 km was electrified. The system incorporates the use of high-speed trains on selected tracks. Similarly, its highways are extensive and modern to transport goods and services. The inland waterways are increasingly used to transport more goods; however, they always have been significant avenues of commerce, with 6,969 km of the 14,932-km-long waterways heavily used. The major seaports are Bordeaux, Boulogne, Brest, Cherbourg, Dunkerque, Fos-sur-Mer, Le Havre, Marseille, Nantes, Rouen, Sete, and Toulon.

One of the most significant infrastructure developments in recent times has been the Channel Tunnel Project. The tunnel, constructed underneath the English Channel, connected Coquelles, near Calais, France, and Folkestone, England. Transportation, not only in France but also in the whole of Europe, was expected to change significantly from the operation of the Channel Tunnel. From these terminals, people drive their vehicles onto trains transporting them 49 km to the other side in about one-half hour. The Channel Tunnel connecting the two countries was expected to be a vital infrastructure component within the EU.

One of the world's most developed economies, France was 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. Several state-owned companies have taken the initiative to become leaders in their respective industries. Others have been forced to make additional adjustments under rationalization schemes proposed by the EU or French Government. The depletion of natural resources and/or the cessation of subsidies for uneconomic operations will have impacts on local communities and their economies. France will have the advantage of plentiful electrical power to attract industrial facilities requiring a good work force and access to significant markets in Europe.

TABLE 1  
FRANCE: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/ METALS	1991	1992	1993	1994	1995 e/
<b>Aluminum:</b>					
Bauxite, gross weight thousand tons	183	104	--	--	--
<b>Alumina:</b>					
Crude do.	538	508	476	438	519 4/
Calcined do.	414	391	367	344	425 4/
<b>Metal:</b>					
Primary do.	286	418	426	438	372 4/
Secondary do.	217	227	222	228	231 4/
Antimony metal, including regulus	760	1,425	848	750	680 4/
Arsenic, white e/	2,309	2,000	--	--	--
Bismuth metal	50	--	--	--	--
Cadmium metal	271	252	137	6	--
<b>Cobalt metal:</b>					
Powder	175	226	222	310	330 4/
Chloride	123	150	150	146	130 4/
<b>Copper:</b>					
Mine output, Cu content	166	149	72	174	172 4/
<b>Metal:</b>					
Blister, secondary e/	5,800	6,100	5,900	4,400	2,580 4/
<b>Refined:</b>					
Primary	19,600	27,700	21,100 r/	16,600	12,000
Secondary e/	30,000	29,000	23,300 r/	25,200	30,440
Total	49,600	56,700	44,400 r/	41,800	42,440 4/
Gold, mine output, Au content kilograms	4,612	2,910	2,155	4,009	4,615 4/
<b>Iron and steel:</b>					
<b>Iron ore and concentrates:</b>					
Gross weight thousand tons	7,472	5,707	3,518	2,420	1,496 4/
Fe content do.	2,316	1,697	1,055 r/	706	432 4/
<b>Metal:</b>					
Pig iron do.	13,646	13,051	12,679 r/	13,293	12,860 4/
<b>Ferrous alloys:</b>					
Blast furnace, spiegelisen and ferromanganese	290	280	300	294	304 4/
<b>Electric furnace:</b>					
Ferrosilicon do.	23	7	--	--	--
Ferromanganese do.	30	60	57	66	99 4/
Ferrosilicon do.	106	98	39	112	108 4/
Silicon metal do.	64	66	59	66	71 4/
Other e/ do.	43	32	29	20	124 4/
Total e/	556	543	484	558	706 4/
Steel ingots and castings do.	18,434	17,961	17,179	18,028	18,096 4/
Semimanufactures do.	16,678	16,172	14,767	16,205	16,164 4/
<b>Lead:</b>					
Mine output, Pb content	1,725	--	--	--	--
<b>Smelter:</b>					
Primary	140,000	130,000	112,281	185,000	150,000
Secondary e/	30,000	25,000	25,000	--	25,000
Total e/	170,000	155,000	137,281	185,000	175,000
<b>Refined:</b>					
Primary, soft lead	154,500	160,500	112,300	105,250	133,580 4/
<b>Secondary:</b>					
Soft lead	57,500	49,400	67,800	76,200	69,500 4/
Pb content of antimonial lead	71,500	74,160	78,600	78,500	86,970 4/
Total	283,500	284,060	258,700	259,950	290,050 4/
Magnesium metal, including secondary	14,050	13,660	10,982	12,280	14,450 4/
Nickel metal	7,410	6,750	9,120 r/	10,041	8,280 4/
<b>Silver: e/</b>					
Mine output, Ag content:					1,167 4/
Lead and zinc concentrates kilograms	23,450	10,440	9,000	--	--
Mixed copper, gold, silver concentrates do.	5,000	3,000	1,100	640	--
Total do.	28,450	13,440	10,100	640	1,167 4/
Metal, Ag content of final smelter products e/ do.	20,000	14,100	12,000	921	666 4/
Tin, secondary, smelter output of solder and other alloys e/	2,400	2,000	3,439	2,700	3,020
<b>Uranium:</b>					
Mine output, U content	2,486	2,119	1,774	1,315	857 4/
Chemical concentrate, U3O8 equivalent	2,300	2,080	1,539	1,245	1,300 4/

See footnotes at end of table.

TABLE 1--Continued  
FRANCE: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1991	1992	1993	1994	1995 e/	
<b>METALS--Continued</b>						
<b>Zinc:</b>						
Mine output, Zn content	27,109	16,539	13,834	1,000	--	
Metal including secondary:						
Slab	299,600	318,700	309,800	306,000	300,400 4/	
Dust e/	9,000	8,000	9,000	10,000	28,000 4/	
<b>INDUSTRIAL MINERALS</b>						
Barite	94,000	96,200	67,200	72,100	75,450 4/	
Bromine, elemental e/	3,000	3,200	2,290	2,190	2,260 4/	
Cement, hydraulic	thousand tons	26,507	21,165	19,320	21,296	19,692 4/
Clays:						
Bentonite e/ 4/	10,000	6,000	6,000	5,000	--	
Kaolin and kaolinitic clay (marketable)	thousand tons	344	334	295	327	345 4/
Refractory clay, unspecified	do.	15	8	7	8	15
Diamonds, synthetic, industrial e/	thousand carats	4,000	3,500	3,500	3,600	3,800
Diatomite e/	thousand tons	250	85	85	90	80
Feldspar, crude e/	do.	400	282	274	390	632 4/
Fluorspar:						
Crude	do.	400	296	185	351	352 4/
Marketable:						
Acid and ceramic-grade	do.	146	118	96	105	102 4/
Metallurgical-grade	do.	50	15	20	26	28 4/
Total	do.	196	133	116	131	130
Gypsum and anhydrite, crude	do.	5,600	5,160	5,000	5,200	4,800
Kyanite, andalusite, related materials e/	do.	50	50	50	60	45
Lime, quicklime, hydrated lime, dead-burned dolomite e/	do.	3,000	3,000	3,000	3,015	2,940 4/
Mica e/	do.	6,000	12,000	8,000	10,000	10,000
Nitrogen, N content of ammonia	thousand tons	1,604	1,848	1,871	1,480	1,470
Pigments, mineral, natural: Iron oxide e/	do.	14,000	12,000	1,000	1,000	1,000
Phosphates, Thomas slag	thousand tons	538	356	300	154	140 4/
Potash:						
Gross weight (run-of-mine)	do.	9,500	8,570	8,200	6,380	6,157 4/
K <sub>2</sub> O equivalent (run-of-mine) e/	do.	1,400	1,400	1,100	936	869 4/
K <sub>2</sub> O equivalent (marketable)	do.	1,129	1,141	890	870	799 4/
Pozzolan and lapilli e/	do.	400	404	526	490	427 4/
Salt:						
Rock salt e/	do.	800	103	116	143	165 4/
Brine salt (refined)	do.	1,000	1,651	1,310	1,658	1,491 4/
Marine salt	do.	1,200	1,156	1,200	1,123	1,473 4/
Salt in solution	do.	3,500	3,206	4,355	4,612	4,410 4/
Total e/	do.	6,500	6,116	6,981	7,536	7,539
Sodium compounds: e/						
Soda ash	do.	1,140	1,100	1,222	1,123	1,120 4/
Sodium sulfate	do.	93	77	62	104	117 4/
Stone, sand and gravel:						
Limestone, agricultural and industrial e/	do.	6,700	6,400	5,800	6,410	6,880 4/
Slate, roof e/	do.	50	45	26	25	27 4/
Sand and gravel: e/						
Industrial sands, total	do.	3,500	6,300	5,400	7,240	6,100 4/
Other sand, gravel and aggregates	do.	319,240 r/	362,600 r/	333,200 r/	353,600	174,900 4/
Sulfur, byproduct:						
Of natural gas	do.	794	770	829	865 r/	825
Of petroleum	do.	225	230	278	219	240
Of unspecified sources e/	do.	180	150	150	100	100
Total e/	do.	1,199	1,150	1,257	1,184 r/	1,165
Talc:						
Crude	do.	340,900	350,500	299,900	306,300	322,300 4/
Powder e/	do.	280,000	260,000	225,000	277,800	297,300 4/
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Asphaltic material e/	do.	43,200	39,400	40,100	38,400	32,300 4/
Carbon black e/	do.	250,000	200,000	204,900	200,000	259,000 4/
Coal, including briquets:						
Anthracite and bituminous	thousand tons	10,128	9,478	8,676	8,040	8,210 4/
Lignite	do.	1,963	1,578	1,670	1,500	1,400 4/
Total	do.	12,091	11,056	10,346	9,540	9,610
Briquets e/	do.	500	500	500	336	276 4/
Coke, metallurgical	do.	5,315	5,362	4,752	4,504	5,770 4/

See footnotes at end of table.

TABLE 1--Continued  
FRANCE: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/		1991	1992	1993	1994	1995 e/
MINERAL FUELS AND RELATED MATERIALS--Continued						
Gas, natural:						
Gross	million cubic meters	4,097	3,300	3,300	3,500	3,500
Marketed	do.	2,845	2,280	2,520	3,610	3,830
Petroleum:						
Crude	thousand 42-gallon barrels	21,240	21,913	20,039	22,823	2,830
Refinery products:						
Liquefied petroleum gas	do.	30,000	29,348 r/	31,262 r/	28,861	30,000
Gasoline, all kinds	do.	145,000	150,416 r/	149,438 r/	146,947	148,000
Jet fuel e/	do.	40,000	41,340 r/	43,672 r/	46,965 r/	45,000
Kerosene	do.	500	500	500	500	500
Distillate fuel oil	do.	210,000	200,000	200,000	200,000	200,000
Heavy fuel oil	do.	75,000	76,000	76,000	79,322 r/	78,000
Other products	do.	40,000	40,000	40,000	40,000	40,000
Refinery fuel and losses	do.	20,000	20,000	20,000	20,000	20,000
Total e/	do.	560,500	557,604 r/	560,872 r/	562,595 r/	561,500

e/ Estimated. r/ Revised.

1/ Table includes data available through Mar. 1996.

2/ In addition to the commodities listed, France also produces germanium from domestic ores and has been described as the world's leading producer of this commodity in French resources. Output was reported as being all from the Saint-Salvy Mine. Unfortunately, actual output is not regularly reported, and the ore from this mine is not sufficiently uniform in grade to permit estimates of output based on reported concentrate production. In addition France produces large quantities of stone, but statistics on output are not available.

3/ Reported number

4/ Includes smectic clay.

TABLE 2  
FRANCE: 1994 BALANCE OF PAYMENTS, SELECTED MINERAL COMMODITIES 1/

(Thousand dollars)

Mineral commodity	Exports to EU	Imports from EU	Net gain or (loss)	Exports to the world	Imports from the world	Net gain or (loss)
Crude industrial minerals:						
Feldspar	5,920	1,800	4,120	6,713	6,305	408
Magnesite	--	553	(553)	30	1,133	(1,103)
Slate	2,714	5,061	(2,347)	3,095	5,145	(2,050)
Other	452,384	396,471	55,913	614,018	677,398	(63,380)
Total	461,018	403,885	57,133	623,856	689,981	(66,125)
Metalliferous ores:						
Copper	4,459	1,996	2,463	4,480	1,996	2,484
Lead	14	4,075	(4,061)	71	45,967	(45,896)
Tin	--	21	(21)	--	21	(21)
Zinc	3,336	30,746	(27,410)	3,381	152,015	(148,634)
Other (including waste and scrap)	1,046,183	490,501	555,682	1,160,211	1,357,595	(197,384)
Total	1,053,992	527,339	526,653	1,168,143	1,557,594	(389,451)
Nonmetallic mineral manufactures						
	260,302	495,004	(234,702)	567,942	804,190	(236,248)
Metals:						
Iron and steel	5,628,475	5,797,501	(169,026)	8,482,201	6,847,803	1,634,398
Mercury	130	130	--	227	220	7
Other nonferrous metals	2,829,521	2,688,797	140,724	3,878,263	4,947,635	(1,069,372)
Total	8,458,126	8,486,428	(28,302)	12,360,691	11,795,658	565,033
Mineral fuels	3,557,896	4,593,167	(1,035,271)	5,658,820	17,600,630	(11,941,810)

1/ Table prepared by Harold Willis, International Data Unit.

TABLE 3  
FRANCE: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of facilities	Annual capacity
Alumina		Aluminium Pechiney (Government)	Plant at Gardanne, Bouches-du-Rhone Province	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
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 Rossigné, Indre Province	100
Bauxite		Aluminium Pechiney (Government)	Mines in Var Province	900
Do.		Société Anonyme des Bauxites et	do.	400
Do.		Alumines de Province (S.A.B.A .P.)	do.	200
Cadmium	tons	Compagnie Royal Asturienne des Mines	Plant at D'Auby-les-Douai, Nord Province	200
Cement		Eight companies, of which the largest are:	80 plants, including--	23,233
Do.		Cement La Farge France	15 plants;	7,815
Do.		Société des Ciments Français	Largest at St. Pierre-la-Cour	(1,160)
Do.			13 plants;	6,190
Do.			Largest at Gargenville	(1,100)
Coal		Charbonnages de France (CdF) including:		13,000
Do.		Bassin de Paris	Mines and washeries in middle France	(2,500)
Do.		Bassin de Nord-Pas-de-Calais	Mines and washeries in northern France	(1,000)
Do.		Bassin de Lorraine	Mines and washeries in eastern France	(9,500)
Cobalt, metal	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	11
Do.		Affinerie Sud-Ouest	Refinery at Toulouse	2
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.		Péchiney Electrometallurgie (Government)	Plants at Bellegarde	387
Do.		Chromeurope S.A.	Plant at Dunkerque	25
Fluorspar		Société d'Enterprises, Carrières et Mines de l'Esterel	Forsante Mine, at Adrets d'Esterel, Var Province	150
Do.		Denain-Anzin Minéraux	Mine and plant at Escaro, Pyrénées	120
Do.		Société Générale de Recherches et d'Exploitation Minière	Mine at Montroc, Tarn Province	100
Gold	kilograms	Société des Mines du Bourneix (Government)	Mines in the Saint Yrieix la Perche District, Limoges	5,000
Do.	do.	Mines d'Or de Salsigne	Mines near Carcassonne	3,000
<b>Iron and steel:</b>				
Iron ore		Lormines S.A. (Government)	Mines in Bassin de Lorraine, eastern France	8,000
Steel		Usinor-Sacilor (Government)	Dunkerque	7,500
Do.		do.	Fos-sur-Mer	4,200
Do.		do.	Seramange	3,000
Do.		Sollac, Unimetal (Usinor-Sacilor, 100%)	Gadrange, Neuves Maisons, Thonville, Trith-St-Leper	8,400
Lead, metal		Société Minière et Metallurgique de Penarroya S.A.	Imperial smelter, Noyelles Godault	150
Magnesium, metal		Société Française d'Electro-Metallurgique, (Péchiney)	Plant at Marignac, Haute Garonne	14
Natural gas	million cubic meters	Société Nationale Elf Aquitaine (SNEA)	Gasfield and plant at Lacq	20,000
Nickel, metal		Société Métallurgie le Nickel (SLN)	Plant at Sandouville	16
<b>Petroleum:</b>				
Crude	barrels per day	Société National Elf Aquitaine (SNEA)	Paris Basin oilfields	1,000
Refined	do.	Compagnie Française de Raffinage (Total)	Refineries at Gonfreville and La Mede	446,000
Do.		Shell-Française	Refinery at Petite Couron	285,000
Do.			Refinery at Berre	270,000
Do.		Elf-France	Refinery at Feyzin	120,000
Do.			Refinery at Donges	200,000
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
Potash, K2O		Mines de Potasse d' Alsace S.A. (M.D.P.A.)	Mines at Amélie, Marie-Louise, and Theodore, in Alsace	11,750
Salt, rock		Compagnie des Salins du Midi et des Salines de l'Est	Varangeville Mine at Saint-Nicolas-de-Port	9,000
Sulfur		Société Nationale Elf Aquitaine (SNEA)	Byproduct from natural gas desulfurization, Lacq plant	3,000
Talc		Talcs de Luzenac S.A. (RTZ Corp. 100%)	Trumons Mine near Ariège, Pyrenees	350,000
Uranium, U3O8	tons	Compagnie Général des Matériaux Nucleaires (Government)	Mines at Limousin, Vendee, and Hérault	1,800
Zinc, metal		Compagnie Royal Asturienne des Mines	Electrolytic plant, Auby-les-Douai	115
Do.		Société des Mines et Fonderies de Zinc de la Vieille Montagne	Electrolytic plant at Viviez	110