

# The Mineral Industry of France

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The 1967 performance of major sectors of the French mineral and energy-producing industry varied; solid fuels and metal ore mining recorded declines with respect to 1966 index figures, but construction materials, petroleum, and refined products showed increases. The production index of miscellaneous minerals and metals remained almost unchanged.

The nation suffered a mild recession in early 1967, but at midyear the Government took measures to stimulate the economy. There was a slack in private consumption, which increased only 3.8 percent compared with the 4.6 percent target. For the year as a whole, the volume of French gross domestic output increased by 4.4 percent compared with a 5-percent growth target.

The value of crude mineral output in 1966, the last year for which complete data are available, was about \$1,779 million.<sup>2</sup> This was equivalent to about 2 percent of the 1966 gross domestic product (production intérieure brut). Distribution of mineral output value by commodity groups was as follows: Energy products (including uranium), \$872 million; quarry products, \$534 million; metallic minerals, \$197 million; and nonmetallic minerals other than quarry products, \$176 million.<sup>3</sup> Solid fuels ranked first in value (\$677 million), followed by sand and gravel (\$198 million), and iron ore (\$173 million). For the first time, the value of iron ore fell below that of sand and gravel.

Domestic smelter production met French requirements for principal nonferrous metals in various degrees with a surplus only in aluminum. Production of refined copper was equal to 13 percent of refined copper consumption (but direct use of scrap increases this figure to 25 to 28 percent

of consumption). Slab zinc output was close to consumption (92 percent) and output of lead was equal to 88 percent of consumption.

As of December 31, 1966, personnel employed in the extractive industry, other than quarrying, totaled 220,312, a decline of 12,905 from the December 31, 1965, total. This was principally the result of reduced employment in coal and iron mines, although employment in all categories of mining except fluorspar and slate also declined. Employment on December 31, 1966, was as follows: Coal and lignite 176,097; iron ore 17,459; other metal mines 5,154; potash 10,857; crude oil, natural gas, asphaltic limestone, and bituminous schist operations 5,097; slate 3,593; and other 2,055. About 99,000 were engaged in quarrying.<sup>4</sup> Cement and lime plants employed about 16,000. Petroleum exploration, production, and refining accounted for 27,000.<sup>5</sup> Among metallurgical plants, the iron and steel industry (exclusive of foundries) employed an average of 120,560 production workers, and 40,700 salaried employees: <sup>6</sup> ferroalloy plants employed 3,970 and nonferrous metals plants 9,000. The total of personnel listed, 536,542, was about 2.7 percent of total French labor force.

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<sup>2</sup> Where necessary, values have been converted from francs (Fr.) to U.S. dollars at the rate of Fr. 1 = U.S. \$0.20255.

<sup>3</sup> Source: Ministère de l'Industrie, Bureau de Documentation Minère, Statistiques de l'Industrie Minérale 1966. Paris, France, 1968, p. 8.

<sup>4</sup> This figure also includes workers engaged in making asbestos cement, and concrete products.

<sup>5</sup> There is some duplication between this figure and the 5,097 employed in the production of crude petroleum, natural gas, asphaltic limestone, and bituminous schist.

<sup>6</sup> Includes salaried employees of activities associated with iron and steel industry.

## PRODUCTION

The index of overall industrial production (1959 = 100) stood at 155 compared with 152 in 1966. Indexes for petroleum and refined products and construction materials mining increased significantly, but other sectors showed only small upward changes, except for the reduction in metal ore mining. The index of building and public works increased from 157 to 162, but the number of permits for construction of dwellings declined from 509,700 in 1966 to about 457,500 in 1967.<sup>7</sup>

Steel production was almost the same as in 1966, while refined lead output increased 1.5 percent. Output of primary aluminum, slab zinc, and refined copper declined by 0.6, 5.3, and 9.1 percent,

respectively. Output of lead and zinc in concentrates increased 7 percent, but bauxite output declined slightly. Among non-metallic minerals, potash and talc showed increases, whereas in the energy industries, domestic crude oil production declined 3 percent, while refined products output increased 11.6 percent. Solid fuel output showed a small decline. Production of electricity increased by 5.7 percent, from 105,600 million kilowatt-hours in 1966 to 111,600 million kilowatt-hours in 1967. Thermal power accounted for 60 percent of the total.

<sup>7</sup> Based on data for the first three quarters.

**Table 1.—France: Indexes of industrial production**

(1959 = 100)

	1966 <sup>1</sup>	1967 <sup>1</sup>	Percent change 1967-66
All industrial production including construction .....	152	155	+1.9
All industrial production excluding construction .....	150	153	+2.0
Solid fuels .....	88	85	-3.5
Petroleum and refined products .....	220	244	+10.9
Electricity .....	164	176	+7.3
Metal ore mining .....	97	88	-9.3
Mining and preparation of miscellaneous minerals .....	122	123	+0.8
Construction material mining .....	169	178	+5.3
Metal production .....	131	131	-----
Ceramics and building material fabrication .....	160	170	+6.2
Chemical industry .....	204	221	+8.3
Building and public works .....	157	162	+3.1

<sup>1</sup> Monthly average.

Source: Ministère de l'Industrie. Bulletin Mensuel de Statistique Industrielle. Paris, France, January and April 1968.

Table 2.—France: Production of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1963	1964	1965	1966	1967 P
<b>Metals:</b>					
<b>Aluminum:</b>					
<b>Bauxite:</b>					
For alumina..... thousand tons	1,911	2,329	2,519	2,673	2,771
For other uses..... do	118	104	143	138	42
Total..... do	2,029	2,433	2,662	2,811	2,813
<b>Alumina: <sup>1</sup></b>					
Hydrated.....	726,900	805,683	873,825	962,799	1,024,000
Calcined.....	649,543	741,139	772,928	844,897	914,000
Metal, primary.....	298,365	315,990	340,528	363,511	361,200
Metal, secondary.....	49,500	50,340	50,250	59,609	58,000
Rolled and extruded, including foil.....	164,964	177,582	177,368	213,165	227,000
Castings.....	81,800	88,440	88,970	91,970	92,000
<b>Antimony:</b>					
Content of ore.....	100	108	121	279	293
Smelter.....	703	639	790	834	600
Arsenic <sup>2</sup> .....	7,982	8,595	9,187	9,038	9,000
Beryllium..... kilograms	6,201	14,281	NA	NA	NA
Bismuth, smelter..... do	43,400	56,065	48,260	69,006	61,000
Cadmium.....	297	492	428	448	499
Chromium.....	531	460	629	NA	NA
Cobalt, smelter.....	752	749	889	840	919
<b>Copper:</b>					
Mine (metal content).....	274	267	283	434	NA
Secondary blister.....	7,100	7,500	11,000	11,000	NA
<b>Refined:</b>					
Electrolytic.....	27,200	30,700	31,900	31,400	37,061
Secondary from scrap.....	6,500	7,200	9,200	11,300	NA
Total.....	33,700	37,900	41,100	42,700	38,800
Gold-silver ore.....	150,034	149,107	148,226	134,166	136,280
Gold in ore..... troy ounces	53,627	54,303	57,389	60,154	87,000
Gold (smelter)..... do	54,560	53,434	56,199	68,674	NA
<b>Iron and steel:</b>					
Iron ore..... thousand tons	57,892	60,938	59,532	55,050	49,220
Pig iron and blast furnace ferroalloys..... do	14,306	15,863	15,770	15,590	15,710
Of which spiegeleisen and high carbon ferromanganese..... do	368	412	432	355	320
Other ferroalloys <sup>3</sup> .....	201	218	247	256	NA
Steel ingots and metal for casting..... thousand tons	17,557	19,780	19,604	19,585	19,655
Rolled steel..... do	13,198	14,619	14,793	14,873	14,847

See footnotes at end of table.

Table 2.—France: Production of mineral commodities—Continued

(Metric tons unless otherwise specified)

Commodity	1963	1964	1965	1966	1967 <sup>p</sup>
<b>Metals—Continued</b>					
<b>Lead:</b>					
Ore.....	10,626	15,595	24,971	r 36,428	37,748
Contained metal in lead and zinc concentrates.....	8,396	12,190	18,051	r 26,754	c 25,000
Smelter, primary.....	77,627	89,790	98,356	108,638	115,900
Secondary.....	10,202	14,475	12,892	15,829	28,100
Antimonial lead <sup>a</sup> .....	17,770	17,415	16,823	17,421	
Total refined lead.....	105,599	121,680	127,571	r 141,888	144,000
Magnesium.....	1,743	989	2,841	r 3,419	4,165
<b>Manganese:</b>					
Ore.....	1,306	1,277	1,400	1,817	NA
Metal.....	925	1,734	2,704	NA	NA
Nickel, metal content of pure nickel, ferronickel, and nickel oxide.....	9,612	7,661	6,418	r 12,782	12,653
Silicon.....	15,445	21,245	21,493	20,828	c 21,000
Silver, content of metallurgical plant final products..... thousand troy ounces.....	3,843	3,688	r 3,475	r 4,129	4,716
Tantalum..... kilograms.....	308	170	NA	NA	NA
Thorium.....	227	180	NA	NA	NA
<b>Tin concentrate:</b>					
Gross weight..... long tons.....	370	655	602	567	c 600
Metal content..... do.....	272	486	447	r 421	c 450
Titanium.....	19	13	NA	NA	NA
Tungsten concentrate, gross weight.....				22	NA
<b>Uranium:</b>					
Ore.....					
Gross weight.....	793,829	773,800	r 827,313	750,764	704,700
Metal content.....	1,083	1,009	r 1,118	1,094	1,227
<b>Concentrate (chemical):</b>					
Gross weight.....	4,700	4,441	r 5,209	5,899	5,830
Metal content.....	1,529	1,470	r 1,530	1,647	1,640
Metal.....	1,205	1,843	NA	NA	NA
<b>Zinc:</b>					
Ore.....	25,781	25,205			
Mixed concentrate (lead and zinc).....	9,514	7,411	38,638	r 43,157	44,700
Zinc content of zinc and lead concentrates.....	18,198	16,841	20,902	r 23,294	c 25,000
Smelter including secondary.....	169,100	190,236	192,036	r 195,991	185,700
Zinc dust.....	4,254	4,120	4,330	r 4,700	5,100
Remelted zinc.....	33,821	r 37,000	34,596	33,213	NA
Zirconium..... kilograms.....	73,300	112,000	NA	NA	NA
<b>Nonmetals:</b>					
Alabaster.....	1,300	820	1,140	1,360	NA
Asbestos.....	23,672	22,035	r 10,141	r 300	NA
Barite.....	74,460	83,821	104,084	r 99,121	95,000
Beach pebble.....	193,320	174,943	170,326	169,000	NA
<b>Building stone:</b>					
Granite and similar rocks..... thousand tons.....	896	1,034	r 1,127	984	NA

Limestone.....do.....	2,886	3,850	3,019	2,612	NA
Marble.....do.....	199	245	501	515	NA
Other stones.....do.....	124	127	123	192	NA
Crushed limestone and granite.....do.....	2,812	4,080	3,890	3,684	NA
Cement, all types.....	18,134	21,537	22,365	23,304	24,600
Chalk and similar calcareous rocks.....thousand tons..	3,853	3,676	3,608	3,862	NA
Clays:					
Bentonite.....	19,959	17,328	15,527	14,365	NA
Brick and tile clay.....thousand tons..	8,555	9,993	10,530	9,960	NA
Ceramic and pottery clay.....	391,306	355,162	338,203	471,895	NA
Clay and marl for cement industry.....thousand tons..	6,678	8,370	10,045	10,356	NA
Kaolin and kaolinic clay.....	271,792	287,475	295,392	435,444	NA
Refractory clay.....thousand tons..	912	1,057	1,034	712	NA
Diatomaceous earth.....	132,725	133,083	150,635	141,258	NA
Dolomite:					
For agriculture.....	106,177	92,495	130,540	117,485	NA
Crude for calcining.....	476,386	611,552	668,930	747,706	NA
Other.....	367,518	416,150	500,867	520,366	NA
Feldspar and pegmatites.....	173,504	196,361	221,141	222,162	NA
Fluorspar.....	145,428	195,153	195,565	215,435	NA
Fly ash.....thousand tons..		4,583	4,022	3,779	NA
Gypsum:					
For agriculture.....	11,073	8,134	7,510	8,839	NA
Plaster and cement.....thousand tons..	4,107	4,790	4,872	5,119	NA
Anhydrite.....	95,637	113,974	132,986	144,394	NA
Lava.....	10,029	13,388	9,786	10,794	NA
Lime:					
Hydraulic.....thousand tons..	739	791	831	855	NA
High-grade (fat lime).....do.....	2,648	2,917	2,825	2,910	2,730
Limestone:					
For agriculture.....do.....	724	749	702	642	NA
For iron and steel industry.....do.....	4,317	5,071	5,105	4,835	NA
For lime and cement.....do.....	19,227	21,339	22,367	23,122	NA
For sugar mills.....do.....	639	735	672	483	NA
Total.....do.....	24,907	27,894	28,846	29,082	NA
Marl.....	215,775	217,272	224,654	176,664	NA
Mica.....	173	293	195	223	NA
Millstones and grindstones.....	1,267	1,113	1,202	1,548	NA
Mine fill.....thousand tons..	10,212	12,719	12,665	12,379	NA
Ochre and mineral pigments.....	4,747	5,265	4,513	3,145	NA
Phosphatic chalk.....	50,423	43,109	34,590	36,420	24,400
Potash:					
Gross weight of mine run ore.....thousand tons..	11,058	11,406	11,832	11,537	11,694
K <sub>2</sub> O equivalent.....do.....	1,722	1,807	1,879	1,910	1,937
Pumice.....	770	916	708	806	NA
Pozzolana and lapilli.....	545,661	585,631	709,543	671,650	NA
Pyrite.....	252,310	191,341	134,361	88,076	85,000
Quartz.....	262,429	302,165	315,683	438,082	NA
Road building foundation and ballast materials (other than sand and gravel):					
Ballast.....thouand tons..	45,965	52,279	57,793	63,475	NA
Foundation material.....do.....	3,224	5,329	4,675	7,155	NA

See footnotes at end of table.

Table 2.—France: Production of mineral commodities—Continued

(Metric tons unless otherwise specified)

Commodity	1963	1964	1965	1966	1967 <sup>p</sup>
<b>Nonmetals—Continued</b>					
Road building foundation and ballast materials (other than sand and gravel):—Continued					
Paving block and curbing.....do.....	152	230	139	139	NA
Ground rock for road fillers.....do.....	306	87	151	557	NA
Total.....do.....	49,647	57,925	62,758	71,326	NA
Salt.....do.....	3,694	4,032	4,449	4,462	NA
Sand and gravel (alluvial only):					
By dredging.....do.....	53,527	61,918	66,999	73,483	NA
By other winning methods.....do.....	35,196	48,490	54,353	59,059	NA
Total.....do.....	88,723	110,408	121,352	132,542	138,000
Sand, industrial:					
Glass.....do.....	1,211	1,438	1,613	1,411	NA
Foundry.....do.....	1,741	1,692	1,697	1,635	NA
Miscellaneous.....do.....	282	451	452	584	NA
Total.....do.....	3,234	3,581	3,762	3,630	3,400
Slate:					
Roof.....do.....	119,046	121,319	121,211	122,583	121,000
Other.....do.....	47,156	45,700	56,763	51,461	45
Sulfur.....do.....	1,409	1,511	1,521	1,540	1,645
Talc.....do.....	158,121	205,400	240,288	224,076	225,000
<b>Mineral fuels:</b>					
Bituminous and asphaltic material.....do.....	109,225	107,608	117,000	131,249	135,000
Bituminous and anthracite coal.....do.....	47,762	53,042	51,348	50,338	47,625
Lignite.....do.....	2,471	2,244	2,690	2,564	2,931
Peat.....do.....	35	50	47	58	NA
Coke oven coke (including low temperature, oven coke and breeze).....do.....	13,735	14,303	13,650	13,200	12,630
Gas coke.....do.....	138	61	20	14	9
Coal briquets.....do.....	8,014	6,638	5,806	5,050	4,839
Natural gas <sup>3</sup> (gross production).....do.....	265,494	280,362	279,338	279,055	302,010
(marketed product).....do.....	171,664	179,751	173,268	182,258	196,313
Petroleum:					
Crude.....do.....	2,522	2,845	2,988	2,925	2,832
Refinery products <sup>6</sup> .....do.....	44,094	50,376	57,596	63,139	70,443
Carbon black.....do.....	76,200	85,960	99,800	120,250	120,000

<sup>o</sup> Estimate. <sup>p</sup> Preliminary. <sup>r</sup> Revised. NA Not available.

<sup>1</sup> Hydrated and calcined alumina are successive stages of alumina production and are not to be added.

<sup>2</sup> Arsenic content of final products.

<sup>3</sup> Ferromolybdenum, ferrotungsten, and ferrovanadium data are for contained metal.

<sup>4</sup> Lead content.

<sup>5</sup> Natural gas reported in cubic meters has been converted to cubic feet at 60° F (15.56° C) and 14.7 pounds per square inch (760 millimeters of mercury) by multiplying cubic meters by 35.3145.

<sup>6</sup> Gross refinery output.

## TRADE

Mineral commodity trade as a part of total French commodity trade is shown in the following tabulation:

	Value (million dollars)		Mineral commodities' share of total (percent)
	Mineral commodities	Total trade	
Exports:			
1965.....	1,989	10,048	19.8
1966.....	2,064	10,886	19.0
1967.....	2,039	11,833	17.9
Imports:			
1965.....	3,091	10,336	29.9
1966.....	3,456	11,840	29.2
1967.....	3,478	12,406	28.0
Trade balance:			
1965.....	-1,102	-288	XX
1966.....	-1,392	-954	XX
1967.....	-1,439	-1,023	XX

Iron and steel (including scrap), petroleum and petroleum products, and nonferrous minerals and metals (including semimanufactures) were the most important export items in the mineral field accounting for about 9.1, 2.6, and 2.9 percent, respectively, of all French exports.

Mineral fuels remained dominant among mineral imports accounting for 51 percent of the value of the tabulated mineral and metal imports and 14.4 percent of all imports.

The other countries of the European Economic Community (EEC)<sup>8</sup> and the countries of the European Free Trade

Association (EFTA)<sup>9</sup> remained France's most important trading partners. In 1967, 41.3 percent of all exports of France were to other EEC countries and 15.8 percent to EFTA countries. The corresponding import figures were 43.5 and 11.5 percent.

In 1966, for the minerals and metals tabulated in table 3, on a value basis, France's exports to other EEC nations were 50 percent of the total; those to the EFTA countries were 18 percent. For the same commodities, imports from the EEC countries were 41 percent of the total; those from the EFTA countries were 11 percent. French exports to the United States were valued at \$138 million and imports \$120 million. In 1966, the United States was an important market for French iron and steel (\$88 million), aluminum and semimanufacturers (\$19 million), and copper semimanufactures (\$9 million). France's principal imports from the United States in 1966 were nonferrous metals (particularly silver, copper, and aluminum) valued at \$82 million, coal (\$32 million), petroleum products (\$11 million), and nonferrous ores and scrap (\$7 million).

<sup>8</sup> The EEC includes Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany.

<sup>9</sup> The EFTA includes Austria, Denmark, Finland (associated member), Norway, Portugal, Sweden, Switzerland, and the United Kingdom.

Table 3.—France: Exports of mineral commodities

(Metric tons unless otherwise specified)

Commodity	Total export		1966 destinations		
	1965	1966	EEC <sup>1</sup>	Principal destinations	
<b>Metals:</b>					
<b>Aluminum:</b>					
Oxide and hydroxide <sup>2</sup> .....	131,730	158,088	9,401	Switzerland 64,815; United States 39,519; Spain 26,299.	
Bauxite.....	201,784	280,173	127,418	West Germany 121,606; Greece 82,829; United Kingdom 61,018.	
Metallurgical residues.....	2,981	4,619	4,519	Italy 3,221.	
Metal, including alloys:					
Scrap.....	12,377	15,244	14,950	Italy 10,746; West Germany 3,684.	
Ingots.....	182,699	171,043	180,735	Belgium-Luxembourg 100,070; West Germany 17,035; United States 16,776.	
Semimanufactures.....	42,596	58,144	26,922	United States 12,717; West Germany 9,080; Belgium-Luxembourg 8,864.	
<b>Antimony: Metal, including scrap</b> .....					
Arsenic (anhydride).....	74	61	20	NA.	
Beryllium.....	10,373	10,889	1,274	United States 4,388; Japan 1,850.	
Bismuth.....	6	5	-----	United States 4.	
Cadmium.....	59	71	-----	All to United Kingdom.	
Chromium:	104	46	28	Netherlands 15.	
Oxide and hydroxide.....	750	1,054	249	Sweden 225; Netherlands 137; Denmark 135.	
Ore.....	403	211	204	West Germany 204.	
Metal.....	340	332	63	United States 182.	
Cobalt.....	649	605	81	United States 453.	
Columbium.....	value, thousands	\$1	\$1.2	NA.	
<b>Copper:</b>					
Metallurgical residues.....	7,500	3,990	3,990	Belgium-Luxembourg 2,182; West Germany 1,808.	
Matte.....	1,663	692	692	Netherlands 443; West Germany 107.	
Metal and alloys:					
Blister and other unrefined.....	18,634	15,900	15,713	Belgium-Luxembourg 11,675; West Germany 4,038.	
Scrap.....	41,199	39,532	36,505	West Germany 15,334; Belgium-Luxembourg 10,432; Italy 10,278.	
Refined.....	10,583	15,607	12,327	West Germany 5,613; Netherlands 3,791.	
Semimanufactures.....	34,352	31,379	13,752	United States 7,478; West Germany 6,429; Netherlands 5,092.	
Gallium <sup>3</sup> .....	value, thousands	\$170	\$4	Switzerland \$160.	
Germanium.....	7	4	4	All to Belgium-Luxembourg.	
<b>Gold:<sup>4</sup></b>					
Metal, including alloys.....	troy ounces	16,847	47,454	33,211	Netherlands 15,111; Belgium-Luxembourg 14,918.
Ashes and sweepings.....	do.	3,890	1,382	-----	Martinique 868.
Other metal (temporary imports and exports).....	do.	51,409	103,429	48,290	Switzerland 48,290; Netherlands 36,619.
<b>Iron and steel:</b>					
Iron ore.....	thousand tons	20,747	18,195	18,131	Belgium-Luxembourg 13,373; West Germany 4,758.
Pyrite cinder.....	do.	243	303	303	West Germany 263; Belgium-Luxembourg 40.
Slag, dust, scale, etc.....	do.	1,193	1,146	1,104	West Germany 1,041.
Scrap.....	do.	1,822	1,823	1,821	Italy 1,712.
Pig iron, <sup>5</sup> including spiegeleisen.....	do.	130	83	76	West Germany 45; Belgium-Luxembourg 18; Italy 11.
Ferroalloys.....	do.	256	254	154	United States 65; West Germany 61; Italy 43; Belgium-Luxembourg 43.
Ingots and other primary forms.....	do.	787	910	538	Italy 231; Belgium-Luxembourg 174; Spain 140; West Germany 131.



<b>Semimanufactures:</b>					
Bars, rods, sections	do	2,372	2,369	969	West Germany 605; United States 422; Belgium-Luxembourg 185.
Universals, plate, sheet	do	2,426	2,157	991	West Germany 706; United States 174; Italy 172.
Hoop and strip	do	223	225	133	West Germany 71; Italy 46; Switzerland 28.
Rails and accessories	do	140	90	39	Italy 30; Cameroon 12; Netherlands 6; Switzerland 6.
Wire	do	111	99	15	West Germany 9; Algeria 7.
Tubes, pipes, fittings	do	601	572	113	Netherlands 64; United States 62; Algeria 28.
Castings and forgings, rough	do	4	4	1	West Germany 1.
<b>Lead:</b>					
Ore		3,178	1,637	1,482	Belgium-Luxembourg 1,482.
Metallurgical residues		5,799	5,351	5,317	Belgium-Luxembourg 4,993.
Oxides		5,628	7,171	2,857	Netherlands 1,966; Czechoslovakia 1,303.
<b>Metal including alloys:</b>					
Scrap		12,132	2,276	2,189	Italy 1,852.
Pig, including alloys		14,926	9,225	4,523	Switzerland 3,258; Netherlands 2,303; West Germany 1,911.
Semimanufactures, including alloys		1,160	1,012	168	Norway 138; Syria 102.
<b>Magnesium, all forms</b>				7	Greece 40; Sweden 22.
<b>Manganese:</b>					
Ore		1,591	763	424	Spain 230; Italy 199.
Oxide		221	213	135	West Germany 135.
Metal, all forms		1,590	3,443	1,535	United States 1,440.
	76-pound flasks	203	203	116	West Germany 87.
<b>Mercury</b>					
<b>Molybdenum:</b>					
Ore		15	27	9	Sweden 18.
Oxide		60	71	26	United States 26.
Metal, all forms		11	9	6	West Germany 4.
<b>Nickel:</b>					
Matte, speiss, etc		56	22	16	Italy 11.
Metallurgical residues		854	754	365	Italy 276; United States 256.
Oxide and hydroxide		380	395	323	Belgium-Luxembourg 234.
<b>Metal including alloys:</b>					
Scrap		1,378	1,591	1,148	West Germany 508; United Kingdom 413.
Ingot		4,808	7,149	1,900	Mainland China 4,837; West Germany 718.
Semimanufactures, including anodes		1,773	1,961	976	Netherlands 367; West Germany 338; Spain 307.
<b>Platinum and platinum-group:</b>					
Metal, including alloys	troy ounces	73,947	93,591	45,365	Netherlands 31,347; Spain 22,859.
Ashes and sweepings	do	96	96		NA.
Selenium		1	1	1	NA.
<b>Silver:</b>					
Metal, including alloys	thousand troy ounces	6,186	6,131	2,735	Netherlands 1,167; Sweden 917; Italy 903.
Ashes and sweepings	do	122	290	131	Finland 16.
Sodium metal		1,905	2,624	2,528	Italy 2,528.
Tantalum (powder)		2	2	1	United States 1; Netherlands 1.
<b>Tin:</b>					
Ore	long tons	642	560		Spain 555.
Oxide	do	54	49	48	All to West Germany.
<b>Metal including alloys:</b>					
Scrap	do	26	46	46	West Germany 31.
Ingot	do	231	227	11	Switzerland 53; Algeria 37; United Kingdom 34.
Semimanufactures	do	83	40	9	Belgium-Luxembourg 8.
<b>Titanium:</b>					
Dioxide		10,725	5,867	1,003	United States 2,438.
Metal, all forms		48	36	29	Netherlands 24.

See footnotes at end of table.

Table 3.—France: Exports of mineral commodities—Continued

(Metric tons unless otherwise specified)

Commodity	Total export		1966 destinations	
	1965	1966	EEC <sup>1</sup>	Principal destinations
<b>Metals—Continued</b>				
<b>Tungsten:</b>				
Ore.....	5	3	3	NA.
Trioxide.....	122	112	20	Austria 92.
Metal, all forms.....	206	267	75	United Kingdom 132; West Germany 46.
<b>Uranium and other radioactive materials:</b>				
Ore.....	2,888	2,496	2,496	All to West Germany.
Metal, including thorium..... kilograms.....	1,300	NA		
Other radioactive material..... metric tons.....	333	473	173	Italy 61; United Kingdom 55; Netherlands 38; United States 38.
<b>Zinc:</b>				
Ore.....	505	237	237	All to Belgium-Luxembourg.
Matte, ashes, residues.....	14,230			
Dust (blue powder).....	1,292	1,397	35	Norway 1,300.
Oxide.....	4,720	7,578	2,677	Mainland China 1,530; Belgium-Luxembourg 1,516.
<b>Metal including alloys:</b>				
Scrap.....	764	1,511	1,511	Italy 1,423.
Slab and ingot.....	18,022	20,428	7,519	Italy 5,975; United States 3,035.
Semimanufactures.....	3,041	2,489	1,642	West Germany 1,641.
<b>Zirconium:</b>				
Ore.....	177	283	229	West Germany 204.
Oxide.....	58	82	40	Spain 32; Italy 30.
Metal, including nuclear grade.....	38	155	16	United States 68.
Other metals <sup>2</sup> .....	65	179	31	Spain 89; West Germany 24.
Other metallic ores, ashes, residues.....	28,605	31,330	18,710	Belgium-Luxembourg 15,165; Sweden 11,791.
Other slag and ash.....	114,553	145,906	139,795	West Germany 68,026.
<b>Nonmetals:</b>				
Abrasives, natural, n.e.s.....	381	398	380	West Germany 225.
Asbestos, crude.....	5,013	1,928	413	Algeria 1,036; Tunisia 285.
Asbestos-cement products.....	34,277	51,577	32,026	West Germany 23,751; United Kingdom 5,389.
Barite, including witherite.....	14,046	12,900	5,914	Belgium-Luxembourg 3,023; Nigeria 2,939; Italy 2,293.
Borates, natural.....	1,212	2,119	1,613	Netherlands 980; West Germany 618.
Bromine.....	1,101	1,096	21	Switzerland 653; United Kingdom 417.
Cement..... thousand tons.....	717	854	329	West Germany 245; Spain 135; Cameroon 59.
Chalk.....	269,803	293,091	253,384	West Germany 118,759; Belgium-Luxembourg 75,464; Netherlands 38,917.
<b>Clays and clay products:</b>				
<b>Crude:</b>				
Kaolin.....	56,109	55,946	49,743	West Germany 40,055.
Bentonite.....	2,429	3,777	276	Nigeria 1,584.
Refractory.....	343,201	332,532	301,903	Italy 162,386; Belgium-Luxembourg 49,058.
Other.....	26,714	52,892	44,558	West Germany 15,894; Italy 15,831.
Clay and refractory construction materials (bricks, tile, etc.).....	194,642	174,001	103,381	West Germany 56,955; Belgium-Luxembourg 35,570.
<b>Corundum:</b>				
Natural, including emery.....	50	72	21	NA.
Artificial.....	10,172	13,858	8,379	Italy 3,342; West Germany 2,958; Belgium-Luxembourg 1,785.

Cryolite and chiolite, natural	556	11	10	NA.
<b>Diamond:</b>				
Industrial, excluding powder	value, thousands	\$1,883	\$1,366	\$913
Gem, unset	do	\$3,843	\$4,859	\$1,435
Dust and powder	do	\$112	\$174	\$150
Diatomite		16,564	19,787	17,654
Dolomite, including calcined		24,674	29,010	16,812
Earth pigments, including iron oxide		8,376	3,763	1,151
Earths, other (pozzolan, santorin, etc.)		2,139	1,735	677
Feldspar		25,338	23,467	18,434
<b>Fertilizer materials:</b>				
Crude:				
Nitrogenous (natural sodium nitrate)		487	---	---
Phosphate rock		14,606	2,060	840
Potassic salts		92,151	70,624	67,124
Organic		32,602	36,454	12,106
Manufactured:				
Ammonia, anhydrous	thousand tons	23	35	3
Nitrogenous	do	645	720	86
Phosphatic:				
Basic slag	do	337	343	34
Other	do	47	45	11
Potassic	do	1,187	1,110	413
Flint (pebbles)		80,792	78,753	33,919
Fluorspar		86,332	88,397	72,365
Graphite		1,900	1,788	780
Gypsum and anhydrite, including plaster		786,572	807,405	505,314
Lime		194,110	240,391	196,326
Limestone, for flux, cement, etc.		179,593	155,290	110,931
Magnesite, including calcined		534	229	---
Mica		577	731	---
Precious and semiprecious stones *	value, thousands	\$8,660	\$9,769	\$1,312
Pumice		33	142	47
Pyrite		30	---	---
Quartz and quartzite		1,874	599	---
Salt		94,071	117,675	102,100
<b>Sodium and potassium compounds, n.e.s.:</b>				
Caustic soda		114,804	159,178	16,687
Caustic potash		10,562	9,592	3,198
Slate, rough and finished		17,089	18,250	17,208
Stone, sand and gravel: *				
Building stone:				
Unfinished		120,494	106,465	96,778
Finished		6,014	5,397	4,371
Gravel and other crushed stone	thousand tons	5,839	7,428	6,472
Sand	do	1,451	1,778	1,351
Sulfur, elemental	do	925	893	214
Talc and steatite		51,132	44,114	16,172
Other mineral substances		146,413	119,674	20,009
<b>Mineral fuels:</b>				
Asphalt and bitumen, natural		19,230	23,982	---
Asphalt, worked		5,660	5,920	2,685

See footnotes at end of table.

Table 3.—France: Exports of mineral commodities—Continued

(Metric tons unless otherwise specified)

Commodity	Total export		EEC <sup>1</sup>	1966 destinations
	1965	1966		Principal destinations
<b>Nonmetals—Continued</b>				
Carbon black.....	41,421	46,431	14,920	Spain 14,669.
Coal.....	842,581	697,637	618,192	West Germany 356,448; Netherlands 140,842; Belgium-Luxembourg 100,330.
Coal briquets.....	40,868	20,556	12,655	Italy 12,594; Switzerland 6,194.
Coke.....	57,152	109,929	61,172	Belgium-Luxembourg 30,055; West Germany 13,473; Algeria 11,210.
<b>Gas:</b>				
Natural, including liquid petroleum gas (propane, butane, and other liquid petroleum gases).....	392,147	427,260	63,246	Spain 184,819; Portugal 94,082; United Kingdom 63,010.
Manufactured.....	196	2,777	2,777	All to Belgium-Luxembourg.
Lignite, including briquets.....	61,174	77,334	-----	Spain 76,862.
Peat, including briquets.....	488	442	422	NA.
<b>Petroleum refinery products:</b>				
Gasoline.....thousand tons..	1,889	2,105	708	United Kingdom 607; Switzerland 566; West Germany 518.
Kerosine.....do.....	490	395	67	Switzerland 180; United Kingdom 51; Netherlands 39.
Distillate fuel oil.....do.....	3,472	4,340	2,539	West Germany 1,789; Switzerland 1,155; Netherlands 634.
Residual fuel oil.....do.....	3,187	4,945	2,265	West Germany 1,282; United Kingdom 1,254; Belgium-Luxembourg 624; Switzerland 358.
Lubricants.....do.....	244	275	100	Belgium-Luxembourg 43; United Kingdom 33; Netherlands 29; Algeria 28.
Other.....do.....	349	448	210	West Germany 162; Switzerland 126; Belgium-Luxembourg 38.
Total refined products.....do.....	9,581	12,508	5,889	West Germany 3,791; Switzerland 2,393; United Kingdom 2,179; Netherlands 1,145.
Chemical derivatives of coal, petroleum, or gas.....	76,886	92,679	55,296	Belgium-Luxembourg 18,172; West Germany 18,056; Netherlands 15,235; United States 12,815.

NA Not available.

<sup>1</sup> Belgium, West Germany, Italy, Luxembourg, and the Netherlands.<sup>2</sup> Excludes artificial corundum.<sup>3</sup> Including indium and thallium.<sup>4</sup> Calculated from quantities reported in kilograms.<sup>5</sup> Including cast iron and shot, grit, powder, and sponge of iron or steel.<sup>6</sup> Including wire rod.<sup>7</sup> Alkali, alkaline earth, and rare earth metals except sodium.<sup>8</sup> Including synthetic and reconstituted stone but not including diamond.<sup>9</sup> Not including slate, flint, or industrial limestone.

**Table 4.—France: Imports of mineral commodities**

(Metric tons unless otherwise specified)

Commodity	Total imports		1966 sources	
	1965	1966	EEC <sup>1</sup>	Principal destinations
<b>Metals:</b>				
<b>Aluminum:</b>				
Bauxite.....	116,508	153,557	322	Greece 87,854; British Guiana 44,237; Surinam 17,531.
Oxide and hydroxide <sup>2</sup> .....	19,700	20,530	866	Guinea 10,300; United States 9,296.
Metallurgical residues.....	11,615	9,372	9,182	West Germany 8,042.
Metal including alloys:				
Scrap.....	2,165	7,121	4,736	Belgium-Luxembourg 3,521; United Kingdom 1,017.
Ingots.....	71,694	87,268	9,287	Cameroon 25,439; United States 19,936; Greece 11,675.
Semimanufactures.....	19,425	30,426	25,885	West Germany 13,281; Belgium-Luxembourg 9,652.
<b>Antimony:</b>				
Ore and concentrate.....	1,678	1,522	1	Morocco 1,061; Republic of South Africa 376.
Metal, all forms.....	1,737	2,443	272	Mainland China 2,128.
Arsenic, including anhydride.....	144	39	8	Sweden 30.
<b>Beryllium:</b>				
Ore.....	NA	408	-----	All from Australia.
Metal, all forms..... value, thousands..	\$180	\$385	-----	United States \$371.
Bismuth.....	700	749	175	Peru 169; Japan 141; United Kingdom 113.
Cadmium.....	408	549	169	Japan 145; Belgium-Luxembourg 99; Congo (Kinshasa) 72.
<b>Cobalt:</b>				
Ore.....	11,672	12,124	-----	Morocco 12,071.
Oxide and hydroxide.....	131	136	132	Belgium-Luxembourg 126.
Metal, all forms.....	313	437	332	Belgium-Luxembourg 297.
<b>Chromium:</b>				
Ore.....	224,287	237,364	207	U.S.S.R. 103,505; Turkey 61,880; Iran 39,733.
Oxide and hydroxide.....	1,870	1,870	1,379	West Germany 1,379; United Kingdom 435.
Metal.....	14	4	3	NA.
<b>Columbium:</b>				
Ore (including tantalum ore).....	138	429	-----	Canada 423.
Metal, all forms..... value, thousands..	\$128	NA	NA	
<b>Copper:</b>				
Metallurgical residues.....	112	494	365	Italy 205; Switzerland 110.
Matte.....	297	1,555	506	Peru 529; Zambia 467.
Metal including alloys:				
Scrap.....	11,855	18,719	13,066	West Germany 8,364; Belgium-Luxembourg 3,603.
Blister and other unrefined.....	6,290	6,886	234	Congo (Kinshasa) 6,401.
Refined.....	262,019	303,420	128,663	Belgium-Luxembourg 107,163; Zambia 52,883; United States 33,183; Congo (Kinshasa) 25,673; Chile 25,429.
Semimanufactures.....	15,767	21,054	15,704	West Germany 5,902; Belgium-Luxembourg 5,790; Italy 2,417.
Germanium, gallium, etc. <sup>3</sup> .....	3	3	2	Belgium-Luxembourg 1; Netherlands 1.
<b>Gold: <sup>4</sup></b>				
Ashes and sweepings..... troy ounces..	345,331	87,643	73,497	West Germany 56,007.
Metal, including alloys..... do.....	87,005	44,497	35,141	West Germany 24,113.
Metal, other (temporary imports and reexports)..... do.....	110,566	210,619	43,146	Switzerland 92,287; United Kingdom 76,197.

See footnotes at end of table.

Table 4.—France: Imports of mineral commodities—Continued

(Metric tons unless otherwise specified)

Commodity	Total imports		1966 sources	
	1965	1966	EEC <sup>1</sup>	Principal destinations
<b>Metals—Continued</b>				
<b>Iron and steel:</b>				
Iron ore..... thousand tons..	3,909	4,245	73	Mauritania 1,422; Liberia 946; Brazil 716; Sweden 396.
Roasted iron pyrites..... do.....	77	59	50	West Germany 32; Italy 17.
Slag, dust, scale, etc..... do.....	708	764	757	West Germany 468; Belgium-Luxembourg 280.
Scrap..... do.....	494	511	460	Belgium-Luxembourg 315; West Germany 118.
Pig iron, spiegeleisen, etc. <sup>5</sup> ..... do.....	124	159	97	West Germany 42; Finland 38 Belgium-Luxembourg 36.
Ferroalloys..... do.....	46	49	17	Caledonia 29; Belgium-Luxembourg 11.
Ingots and other primary forms..... do.....	943	1,061	1,057	Belgium-Luxembourg 510; West Germany 501.
Semimanufactures:				
Bars, rods, sections <sup>6</sup> ..... do.....	1,174	1,304	1,269	West Germany 754; Belgium-Luxembourg 423.
Universals, plates, sheets..... do.....	1,287	1,476	1,385	Belgium-Luxembourg 670; West Germany 514.
Hoop and strip..... do.....	247	275	275	Belgium-Luxembourg 160; West Germany 106.
Rails and accessories..... do.....	38	35	12	United Kingdom 22; Belgium-Luxembourg 9.
Wire..... do.....	51	65	60	West Germany 42; Belgium-Luxembourg 16.
Tubes, pipes, fittings..... do.....	137	137	155	West Germany 90; Belgium-Luxembourg 31; Italy 27.
Rough castings and forgings..... do.....	1,709	2,587	2,106	West Germany 1,405; Belgium-Luxembourg 629; Morocco 49; Australia 33.
<b>Lead:</b>				
Ore.....	130,387	121,017	146	Ireland 12,391.
Metallurgical residues.....	3,347	753	23	Morocco 690.
Oxides.....	2,327	1,506	1,229	Belgium-Luxembourg 741; West Germany 473.
Metals including alloys:				
Scrap.....	2,950	4,150	2,461	Belgium-Luxembourg 1,687; Algeria 1,244; West Germany 774.
Pig.....	28,170	35,399	11,441	Morocco 15,341; Belgium-Luxembourg 7,211; West Germany 3,927.
Semimanufactures.....	484	696	628	Belgium-Luxembourg 386; West Germany 176.
<b>Magnesium including alloys:</b>				
Scrap.....	6	95	89	Italy 89.
Ingots.....	1,196	951	420	Italy 420; United Kingdom 226.
Semimanufactures.....	207	219	34	United Kingdom 92; Canada 39; United States 33.
<b>Manganese:</b>				
Ore.....	854,728	842,082	673	South Africa 312,517; Morocco 201,694; Gabon 183,316.
Oxide.....	1,339	2,159	1,135	Belgium-Luxembourg 1,012; Japan 994.
Metal, all forms.....	725	556	-----	Republic of South Africa 501.
Mercury..... 76-pound flasks..	12,938	8,410	2,755	Italy 2,610; Spain 2,378; Mexico 1,798.
<b>Molybdenum:</b>				
Ore.....	4,171	5,665	177	United States 2,374; Canada 1,659; Peru 972.
Oxide.....	4	NA	-----	-----
Metal, all forms.....	88	86	60	West Germany 49; Austria 24.
<b>Nickel:</b>				
Metallurgical residues.....	11	26	26	NA.
Matte.....	16,823	13,172	-----	New Caledonia 6,997; Cuba 4,848.
Oxide and hydroxide.....	80	33	5	Canada 23.
Metal including alloys:				
Scrap.....	484	588	184	United States 174; West Germany 134; Switzerland 75.

Ingots.....	8,259	8,559	251	Canada 4,120; United Kingdom 3,526.
Semimanufactures.....	2,120	2,651	751	United Kingdom 972; West Germany 676; United States 534.
<b>Platinum and platinum-group: 4</b>				
Metal..... troy ounces.....	176,989	161,461	38,581	Czechoslovakia 48,162; United Kingdom 30,640; West Germany 26,267.
Ashes and sweepings..... do.....	22,377	17,522	14,725	Netherlands 12,539.
Selenium.....	28	42	11	Sweden 16; United States 13.
Silver: 4				
Metal, all forms..... thousand troy ounces.....	24,515	29,756	3,306	United States 12,747; United Kingdom 5,184; Lebanon 3,793.
Ashes and sweepings..... do.....	972	503	490	Netherlands 449.
Tantalum, all forms.....	9	12	7	United States 4; West Germany 4.
Tin:				
Oxide..... long tons.....	8	47	47	West Germany 35.
Metal including alloys:				
Scrap..... do.....	40	38	-----	Switzerland 34.
Ingots..... do.....	10,042	10,544	3,450	Malaysia 3,569; Netherlands 2,056.
Semimanufactures..... do.....	115	42	10	United Kingdom 26.
<b>Titanium:</b>				
Ore.....	94,919	110,516	-----	Australia 70,360; Malaysia 23,265; Spain 16,488.
Dioxide.....	14,721	17,307	13,169	West Germany 8,311; United Kingdom 3,289.
Metal, all forms.....	297	337	117	Japan 120; West Germany 109.
<b>Tungsten:</b>				
Ore.....	2,188	2,468	10	South Korea 1,014; mainland China 988.
Trioxide.....	67	57	57	West Germany 52.
Metal, all forms.....	67	74	54	West Germany 39; Netherlands 14.
<b>Uranium and thorium:</b>				
Uranium ore.....	2,239	1,741	-----	Gabon 1,340; Malagasy Republic 401.
Thorium ore.....	1,404	1,398	-----	Malagasy Republic 992; Australia 406.
Metal, including alloys..... kilograms.....	500	NA	NA	
Other radioactive materials..... do.....	157,000	267,000	39,000	United States 117,000; Brazil 36,000.
<b>Vanadium pentoxide.....</b>	611	784	416	West Germany 416; Finland 250.
<b>Zinc:</b>				
Ore.....	332,225	348,258	23,174	Canada 75,799; Morocco 73,657; Peru 39,069; Sweden 34,798.
Matte, ashes, residues.....	6,957	6,957	5,600	West Germany 2,885; Belgium-Luxembourg 2,088 Netherlands 627.
Dust (blue powder).....	4,038	4,224	3,995	Belgium-Luxembourg 3,972.
Oxide.....	1,754	1,252	947	West Germany 552; Italy 263.
Metal including alloys:				
Scrap.....	17,209	18,728	17,945	Netherlands 10,287; Belgium-Luxembourg 6,207.
Slab and ingot (including alloys).....	14,546	24,594	15,665	Belgium-Luxembourg 13,606; Norway 2,565.
Semimanufactures (including alloys).....	2,928	3,814	3,315	Belgium-Luxembourg 2,326.
<b>Zirconium:</b>				
Ore.....	29,820	27,882	40	Australia 27,581.
Oxide.....	293	578	27	United States 463.
Metal.....	102	13	-----	NA.
Other metals 7..... value, thousands.....	\$226	NA	NA	
Other metallic ores.....	2,897	NA	NA	
Other metalliferous ash, slag, and residues.....	73,417	94,172	94,170	Belgium-Luxembourg 61,872; West Germany 31,318.
<b>Nonmetals:</b>				
Abrasives, natural, n.e.s.....	2,169	2,725	2,349	Italy 2,305.
Asbestos.....	106,665	124,442	9,069	Canada 71,139; U.S.S.R. 32,602.
Asbestos-cement products.....	81,602	57,972	51,168	Belgium-Luxembourg 21,999; Italy 20,075.
Barite, including witherite.....	74,442	82,938	62,510	West Germany 62,374; Morocco 12,210.
Borates (natural).....	67,301	73,181	124	Turkey 41,876; United States 31,818.
Boric oxide and acid.....	421	827	605	Italy 579; United States 221.

See footnotes at end of table.

Table 4.—France: Imports of mineral commodities—Continued

(Metric tons unless otherwise specified)

Commodity	Total imports		EEC <sup>1</sup>	1966 sources
	1965	1966		Principal destinations
<b>Nonmetals—Continued</b>				
Bromine.....	NA	6	NA.	
Cement.....	94,090	87,842	24,511	Switzerland 62,713; Italy 14,499.
Chalk.....	12,775	8,813	8,747	Belgium-Luxembourg 8,685.
Clay and clay products:				
Crude:				
Kaolin, including calcined.....	209,601	239,852	10,667	United Kingdom 205,804; United States 15,880; West Germany 10,529.
Bentonite.....	114,127	112,769	20,816	Greece 48,391; Italy 20,512; Morocco 18,157.
Refractory clays.....	169,693	171,206	152,405	West Germany 133,659.
Other clays and aluminum silicates.....	26,074	32,227	15,087	United Kingdom 8,679; West Germany 7,480; Belgium-Luxembourg 6,392.
Clay and refractory construction materials (bricks, etc).....	367,117	377,153	321,032	West Germany 168,240; Italy 78,960; Belgium-Luxembourg 71,496.
Corundum:				
Natural, including emery.....	4,935	1,118	490	Greece 577; Netherlands 443.
Artificial.....	1,569	2,396	1,503	West Germany 1,456; United States 577.
Cryolite and chiolite, natural.....	1,380	1,984	-----	All from Denmark.
Diamond:				
Industrial, except dust..... value, thousands.....	\$4,004	\$5,075	\$2,004	Ireland \$1,981; Belgium-Luxembourg \$1,077.
Gem, unset..... do.....	\$15,593	\$20,654	\$10,849	Belgium-Luxembourg \$9,162; Israel \$3,838.
Dust and powder..... do.....	\$3,014	\$3,608	\$1,131	United States \$1,235; United Kingdom \$1,068.
Diatomite.....	9,787	9,132	2,588	United States 3,305; Algeria 2,588; West Germany 1,208; Italy 1,140.
Dolomite, including calcined.....	178,233	183,323	174,961	Belgium-Luxembourg 157,855; West Germany 17,105.
Earth pigments, including iron oxide.....	13,410	15,491	13,194	West Germany 13,002.
Earths, other (pozzolanic, santorin, etc).....	103	332	80	United States 100.
Feldspar.....	15,940	15,523	7,326	West Germany 6,567; Norway 3,833; Portugal 1,989.
Fertilizer materials:				
Crude:				
Nitrogenous (natural sodium nitrate).....	40,760	29,782	-----	All from Chile.
Phosphate rock..... thousand tons.....	2,870	2,939	10	Morocco 1,724; Tunisia 612; Togo 321.
Potassic salts, crude.....	-----	NA	-----	
Manufactured:				
Ammonia, anhydrous.....	42,428	52,471	52,437	Belgium-Luxembourg 48,157.
Nitrogenous.....	128,156	151,516	131,895	Belgium-Luxembourg 112,830; Switzerland 17,465.
Potassic.....	72,788	62,017	42,849	Belgium-Luxembourg 27,385; Spain 19,158.
Phosphatic:				
Basic slag.....	736,856	682,725	682,725	Belgium-Luxembourg 557,786; West Germany 124,939.
Other.....	356,219	300,844	251,101	Belgium-Luxembourg 125,810; Netherlands 124,749.
Flint (pebbles).....	23,127	101,080	7,726	United Kingdom 30,176.
Fluorspar.....	329	3,109	2,142	Italy 1,239; United Kingdom 967; West Germany 903.
Graphite.....	5,007	4,879	1,610	Malagasy Republic 2,698; Italy 1,013.
Gypsum and plaster.....	22,107	23,095	22,494	West Germany 18,452.
Iodine, crude.....	400	-----	-----	
Lime.....	77,833	99,756	98,506	Belgium-Luxembourg 76,184; West Germany 22,302.



Limestone for flux, cement, etc.....	188,748	159,631	159,631	Belgium-Luxembourg 153,591.
Lithium and strontium minerals.....	NA	4,742	4,656	Netherlands 4,656.
Magnesite, including calcined.....	42,962	42,154	3,821	Austria 17,285; United Kingdom 3,785; Greece 3,754.
Mica.....	4,808	7,548	-----	India 5,862; Norway 1,263.
Precious and semiprecious stones..... value, thousands..	\$6,869	\$8,120	\$434	India \$4,459.
Pumice.....	86,679	97,599	33,508	Italy 27,880.
Pyrite.....	350,977	338,984	136	Cyprus 141,488; Spain 133,482; U.S.S.R. 35,976.
Quartz and quartzite.....	17,447	21,667	20,286	Italy 10,842; Belgium-Luxembourg 7,707.
Salt.....	117,733	58,060	21,336	Algeria 36,200; Netherlands 11,284.
Caustic soda.....	26,908	31,597	31,442	Italy 21,846; Belgium-Luxembourg 6,781.
Caustic potash and peroxides of potassium or sodium.....	177	109	41	Sweden 55; West Germany 21.
Slate, rough and finished.....	13,553	21,585	10,506	Italy 8,571; United Kingdom 4,655; Spain 4,536.
Stone, sand and gravel: <sup>9</sup>				
Dimension stone:				
Unfinished.....	121,562	155,885	71,558	Italy 66,079; Republic of South Africa 38,963.
Finished.....	74,087	75,022	62,090	Italy 59,503; Portugal 11,647.
Gravel and other crushed stone..... thousand tons..	2,016	2,531	2,418	Belgium-Luxembourg 2,306.
Sand..... do.....	1,333	1,408	1,394	Netherlands 728; Belgium-Luxembourg 613.
Sulfur, elemental, all grades.....	264,236	226,461	337	Mexico 135,966; United States 86,724.
Talc and steatite.....	6,892	7,670	3,925	Italy 3,548; Austria 1,255; Norway 1,154; United States 1,087.
Other mineral substances.....	313,538	525,349	38,368	Switzerland 461,368.
Mineral fuels:				
Asphalt and bitumen, natural.....	2,169	3,100	1,091	United States 1,488; Trinidad 319.
Asphalt, worked.....	863	2,253	1,188	West Germany 760; Canada 430.
Coal..... thousand tons..	11,929	11,092	6,450	West Germany 5,542; United States 1,776; U.S.S.R. 1,491.
Coal briquets..... do.....	415	333	333	Netherlands 199; Belgium-Luxembourg 81; West Germany 53.
Carbon black.....	39,063	39,654	19,435	United States 17,356; Netherlands 13,009; West Germany, 5,084.
Coke..... thousand tons..	4,462	3,734	3,784	West Germany 2,757; Netherlands 762.
Gas:				
Natural, including liquid petroleum gases.....	65,853	402,332	83,446	Algeria 303,810; West Germany 32,126.
Manufactured.....	123,004	118,815	116,853	West Germany 79,353; Belgium-Luxembourg 37,499.
Hydrogen and rare gases.....	67	517	472	West Germany 249; Italy 161.
Lignite and briquets..... thousand tons..	384	368	368	West Germany 359.
Peat, including briquets..... do.....	19	27	23	West Germany 16; Netherlands 7.
Petroleum:				
Crude..... do.....	58,556	62,752	-----	Algeria 18,492; Iraq 10,401; Kuwait 8,357; Libya 7,280; Iran 4,169.
Refined products:				
Gasoline..... do.....	502	589	236	Italy 177; Rumania 111; U.S.S.R. 92; Netherlands Antilles 59.
Kerosine, including white spirit..... do.....	19	31	15	United Kingdom 14; Belgium-Luxembourg 11.
Distillate fuel oil..... do.....	1,720	2,440	1,177	Italy 988; Rumania 627; U.S.S.R. 480.
Residual fuel oil..... do.....	1,100	1,117	464	U.S.S.R. 380; Italy 369; Rumania 215.
Lubricants..... do.....	33	51	37	Italy 18; Netherlands 13; United States 12.
Other..... do.....	531	505	210	West Germany 172; United States 147; U.S.S.R. 52; United Kingdom 47.
Mineral tar and crude chemicals derived from coal, petroloum, or gas.	209,384	282,719	109,514	United States 97,253; United Kingdom 34,967; Belgium-Luxembourg 33,696; West Germany 32,212.

NA Not available.

- <sup>1</sup> Belgium, West Germany, Italy, Luxembourg, and the Netherlands.
- <sup>2</sup> Excludes artificial corundum.
- <sup>3</sup> Includes gallium, germanian, indium, thallium, rhenium.
- <sup>4</sup> Calculated from quantities reported in kilograms.
- <sup>5</sup> Includes cast iron and sponge, powder, etc., of iron and steel.
- <sup>6</sup> Including wire rod.
- <sup>7</sup> Alkali, alkaline earth, and rare-earth metals including cerium and hafnium.
- <sup>8</sup> Including synthetic and reconstituted stone but not including diamond.
- <sup>9</sup> Excludes slate, flint, and industrial limestone.

Table 5.—France: Summary of mineral commodity trade in 1967

(Thousand metric tons and thousand dollars)

Commodity	Imports		Exports	
	Quantity	Value	Quantity	Value
<b>Metals:</b>				
Iron and steel:				
Iron ore, including pyrite cinder.....	4,889	\$4,811	17,764	\$56,431
Scrap.....	465	1,691	2,191	30,185
Pig iron, ferroalloys, sponge iron, powder, shot and grit.....	246	3,758	332	53,186
Primary steel forms and iron and steel semi- manufactures.....	5,114	680,147	6,563	898,618
Other:				
Ores.....	1,796	122,771	165	4,511
Scrap and other metal-bearing waste.....	70	19,678	146	60,511
Metal oxides for paint and other uses.....	43	20	275	29
Metals including semimanufactures:				
Precious, except gold.....	1	45,787	( <sup>1</sup> )	12,884
Mercury, metalloids, alkali, alkaline earth and rare.....	1	6,780	14	5,901
Other base.....	517	496,448	313	241,930
Total <sup>2</sup> .....	13,142	1,381,891	27,764	1,413,586
<b>Nonmetals:</b>				
Abrasives, natural, including industrial diamond.....	50	9,921	18	2,708
Cement, lime, worked dimension stone and other building materials.....	412	26,597	1,232	27,702
Fertilizer materials:				
Crude.....	3,140	48,867	105	1,641
Manufactured, including Thomas slag.....	1,848	63,768	3,037	104,085
Stone, sand and gravel, except worked dimen- sion stone.....	5,468	24,900	11,808	21,791
Other.....	2,823	133,499	2,974	119,734
Total.....	13,741	307,552	19,174	277,611
<b>Mineral fuels and related commodities:</b>				
Carbon black.....	49	10,618	44	8,977
Coal, lignite, coke, peat and briquets thereof.....	15,482	294,664	925	16,296
Gas, natural and manufactured.....	746	21,083	494	16,633
Petroleum:				
Crude.....	72,348	1,306,489	( <sup>1</sup> )	( <sup>1</sup> )
Products.....	4,921	143,276	12,035	299,901
Crude chemicals distilled from coal, petroleum, and/or natural gas.....	310	12,834	102	6,072
Total <sup>2</sup> .....	93,856	1,788,964	13,600	347,879
Grand total.....	120,739	3,478,407	60,538	2,039,076

<sup>1</sup> Less than ½ unit.<sup>2</sup> Details do not add to totals because of rounding.

Source: Statistical office of the United Nations.

## COMMODITY REVIEW

### METALS

**Bauxite and Aluminum.**— Aluminum production and consumption in France increased about 11 and 20 percent, respectively, in 1966, but remained almost static in 1967. Nonetheless, aluminum consumption for conductors increased 25 percent in 1967. The aluminum semifabrication industry was reorganized around Pechiney, the largest aluminum producer, and led to the formation of Groupe Pechiney<sup>10</sup> with an annual capacity of 500,000 tons of aluminum semimanufactures. Conditions

for the merger of Pechiney and Trefimétaux were completed in October. The The Compagnie Générale du Duralumin et du Cuivre (Cégédur) became a holding company as of July 1 and its industrial operations were transferred to Groupe Pechiney. The latter opened its central research institute at Voreppe/Isère near Grenoble and the new cold rolling mill of its subsidiary, Rhenalu, in Neu-Breisach started operation. This plant has an initial capacity of 2,000 tons monthly which

<sup>10</sup> Excluding Pechiney's chemical and non-EEC interests.

will be increased ultimately to 4,000 tons monthly by 1975. In the next 2 years, a foundry with eight furnaces will be added. Eventually the plant will include a second cold-rolling finishing line for producing strips. The alumina capacity of the Pechiney's Gardanne plant was increased to 1,500 tons per day.

Aluminum trade in 1967 was as follows:

Form	(Metric tons)	
	Imports	Exports
Ingot:		
Not alloyed.....	92,828	103,808
Alloyed.....	6,046	36,474
Total.....	98,874	140,282
Semimanufactures.....	25,952	65,156

The Republic of Cameroon was the largest source of aluminum ingots (43,083 tons) followed by Greece (22,517). Exports were principally to Belgium (41,183 tons), mainland China (23,854), and a number of other European countries. Import sources for semimanufactures were principally Belgium, West Germany, and Canada and export destinations were West Germany, the United States and many other European and non-European countries.

**Copper.**—Primary refined copper consumption was 278,500 tons, 4.4 percent less than in 1966 and the lowest figure since 1964. Substitution of aluminum and plastics in the major use areas contributed to the 1967 decline. About 45 percent of the consumption was in heavy electric equipment production, about 20 percent

in construction and housing, and about 6 percent in automotive and agricultural machinery manufacture.<sup>11</sup> Direct use of scrap in 1966 amounted to 115,900 tons of copper content.

Copper imports in 1967, valued at \$313 million, comprised 1,209 tons of matte, 11,493 tons of scrap, 11,609 tons of blister, 236,936 tons of refined copper, and 23,640 tons of semimanufactures. Copper imports, excluding semimanufactures, were 20 percent lower than in 1966, mainly as a result of smaller refined copper imports. French copper exports, aside from 223 tons of matte and 43,460 tons of scrap, totaled 56,043 tons distributed as follows: Blister 12,453, refined 13,999, semifinished 29,500, and alloys 91.

Production of semifinished copper and copper alloys (wire, rods and sections, plates, sheets and strips, and tubes) totaled 384,000 tons.

**Iron Ore.**—As a result of a strike in early 1967, production of iron ore declined 10.6 percent almost entirely in the Lorraine mines. However, demands were fully met through withdrawals from stocks. The average grade of ore, 31.5 percent, was moderately higher than in 1966 (31.0 percent). In the Lorraine area, production per man-shift (surface and underground) increased to 21 tons from 18.9 tons in 1966.

On the basis of a 24-million-ton steel production target for 1970, the eastern iron ore mines could produce 60 million tons of ore with reasonable marketing prospects. To maintain the region's com-

<sup>11</sup> Metals Week. Feb. 20, 1967, p. 13.

**Table 6.—France: Marketable iron ore production by basin, and total iron ore shipments, and stocks**  
(Thousand metric tons)

	1963	1964	1965	1966	1967
<b>Production:</b>					
Lorraine.....	54,377	57,455	56,125	51,684	46,000
West (Normandy and Anjou).....	3,412	3,400	3,326	3,308	3,200
Pyrenees.....	75	65	80	58	40
Other basins.....	28	18			
Total.....	57,892	60,938	59,532	55,050	49,220
Iron content.....	17,399	18,440	18,098	17,114	15,651
<b>Shipments:</b>					
Domestic.....	36,374	38,689	38,145	36,335	34,499
Other EEC countries.....	21,341	21,882	20,672	18,375	17,223
Other destinations.....	267	227	88	63	83
Total.....	57,982	60,798	58,905	54,773	51,805
Stocks.....	7,711	7,700	8,238	8,300	6,100

NA. Not available.

<sup>1</sup> Detail does not add to totals shown because of independent rounding.

petitive position, mines in this area have plans to invest \$105 million in mining and \$28 million to \$53 million in beneficiation facilities.

**Iron and Steel.—Production.**—In 1967, French pig iron and crude steel production, 15,710,000 tons and 19,655,000 tons, respectively, rose only fractionally over the 1966 level. Crude steel capacity rose from 23.4 to 23.9 million tons. Special steels constituted about 9.5 percent of total crude steel production and oxygen steel (3,295,000 tons) was 16.8 percent of all steel output. France's share of world steel output declined to 4 percent from 4.2 percent in 1965, but France maintained her rank as the sixth largest world steel producer.

A number of production trends reported previously continued during 1967. These included the increase in the share of hematite-pig iron obtained from high-grade

imported ore, the increase in proportion of sintered iron ore used, and the increase in oxygen steel output (in tonnage as well as in share of total steel output). There was no significant change in the geographical pattern of pig iron output (11,075,390 tons in the East and 3,728,179 in the North), but steel output in the North increased by 216,971 tons to 5,464,564 tons, while output in the East declined by 166,055 tons to 12,085,612 tons. Of 83 blast furnaces in operation, 62 were in the East, 16 in the North, three in the Southwest, and two in the West steel areas of France.

The share of flat products in rolled steel output, 49.9 percent, remained almost identical as in 1966.

Although production of individual flat products varied, the total of flat products and the hot-rolled and cold-rolled components thereof remained practically the

**Table 7.—France: Salient iron and steel industry statistics**

(Thousand metric tons unless otherwise specified)

	1963	1964	1965	1966	1967
<b>SINTER</b>					
Production.....	14,478	17,442	18,531	19,436	21,065
Raw material consumption:					
Iron ore.....	17,135	20,780	22,454	23,484	25,433
Furnace dusts.....	1,446	1,476	1,241	1,273	1,007
Manganese.....	39	48	64	54	30
Pyrite cinder.....	58	58	34	38	26
Other iron-bearing materials.....	408	549	591	580	677
Limestone.....	415	404	552	587	702
<b>PIG IRON</b>					
Number of blast furnaces:					
Available.....	143	138	133	127	124
In operation at yearend.....	97	98	94	84	83
Maximum production capacity.....	17,300	18,100	18,770	19,100	19,650
Production:					
Thomas <sup>1</sup> .....	12,069	13,042	12,559	12,245	12,085
Hematite and semihematite (steelmaking).....	782	1,300	1,680	1,983	2,359
Phosphorus (foundry).....	447	452	416	282	207
Hematite and semihematite (foundry).....	444	450	509	552	625
Special pig iron (foundry).....	196	205	174	174	115
Spiegeleisen and high-carbon ferromanganese.....	368	412	432	355	320
Total <sup>2</sup> .....	14,306	15,863	15,770	15,590	15,710
Raw material consumption for pig iron production:					
Iron ore directly in blast furnaces.....	21,860	21,246	19,398	16,968	14,092
Iron ore sinter.....	14,335	17,328	18,337	19,340	21,064
Manganese ore:					
In blast furnaces.....	569	630	677	605	562
In sintering plants.....	38	48	70	55	30
Metallurgical rejects.....	1,120	1,175	1,068	1,182	931
Scrap.....	833	690	478	433	426
Limestone.....	430	312	293	270	231
Phosphatic limestone.....	2	1	1	2	1
Coke in blast furnaces.....	12,116	12,785	12,325	11,584	10,931

See footnotes at end of table.

Table 7.—France: Salient iron and steel industry statistics—Continued

(Metric tons unless otherwise specified)

	1963	1964	1965	1966	1967
<b>STEEL</b>					
<b>Number of furnaces in operation:</b>					
Thomas converters.....	99	95	94	92	89
Open hearth.....	60	62	54	53	52
Electric.....	108	109	109	112	112
Oxygen.....	8	8	9	10	9
Maximum production capacity (all furnaces).....	20,900	21,900	22,500	23,400	23,900
<b>Production of crude steel:</b>					
Thomas.....	9,833	10,604	10,397	10,301	10,112
Open hearth.....	4,774	5,182	4,775	4,483	4,284
Electric.....	1,526	1,675	1,774	1,863	1,905
Bessemer.....	81	93	88	67	67
Kaldo, LD, and similar.....	1,341	2,224	2,568	2,871	3,287
Creuset.....	2	2	2	1	.....
Total.....	17,557	19,780	19,604	19,585	19,655
Ingots.....	17,211	19,413	19,237	19,247	19,307
Liquid steel for casting.....	346	367	367	338	346
<b>Material consumption for steel:</b>					
Pig iron, spiegeleisen, and ferroalloy.....	13,080	14,703	14,633	14,611	14,796
Scrap.....	6,204	7,012	6,884	6,909	6,826
Liquid Thomas steel.....	265	193	173	147	129
Lime.....	1,746	1,933	1,892	1,890	1,831
Limestone.....	64	60	51	47	110
Iron ore.....	151	188	210	213	207
Fluorspar.....	33	37	32	33	33
<b>Consumption per ton of crude steel:</b>					
Pig iron..... kilograms.....	739	737	740	739	740
Scrap..... do.....	359	359	364	366	364
<b>Rolled steel production:</b>					
Rails and accessories.....	337	353	364	259	283
Heavy structural.....	848	1,030	1,122	1,121	1,143
Wire rods.....	1,870	2,010	2,085	2,153	2,106
Bars.....	3,067	3,327	3,480	3,297	3,333
Pipe skelp.....	529	602	609	601	558
Other.....	30	37	31	22	18
<b>Flat products:</b>					
Wide plates.....	81	79	94	94	96
<b>Hot rolled sheets:</b>					
Thickness, 4.76 millimeters or more.....	936	1,199	1,160	1,206	1,354
Thickness, 3 to 4.76 millimeters.....	516	501	500	512	514
Thickness, less than 3 millimeters.....	641	742	726	731	600
Cold rolled sheets: Thickness, less than 3 millimeters.....	3,282	3,647	3,579	3,794	3,825
Hot-rolled strips for tubes.....	1,061	1,092	1,043	1,084	1,017
Subtotal flat products <sup>2</sup> .....	6,517	7,260	7,101	7,419	7,406
Total rolled steel production <sup>2</sup> .....	13,198	14,619	14,793	14,873	14,847
Galvanized and other plated sheets.....	408	506	447	493	522
Condenser sheets.....	178	207	188	187	178
Tinplate.....	591	625	543	659	691
<b>Total consumption of iron and steel industry:</b>					
Iron ore.....	39,141	42,214	42,062	40,664	39,732
Scrap <sup>3</sup> .....	7,037	7,701	7,362	7,342	7,253
Coke.....	13,522	14,327	13,778	12,835	12,145
Coal other than coking coal.....	1,605	1,412	1,608	1,750	1,935
Coking coal.....	5,674	5,712	5,627	5,530	5,502
Fuel oil.....	1,063	1,233	1,234	1,273	1,392
Thomas slag production.....	2,351	2,573	2,546	2,560	2,517
Average total employment (workers and staff).....	130,591	130,806	127,593	120,560	114,102

<sup>1</sup> Revised.<sup>2</sup> Includes special pig iron in metric tons as follows: 1963, 6,137; 1964, 42,994; 1965, 3,749; 1966, 2,729.<sup>3</sup> Detail does not add to total because of rounding.<sup>4</sup> Excludes scrap used by rolling mills in tons as follows: 1963, 77,866; 1964, 85,858; 1965, 98,284; 1966, 93,813

1967, 108,080.

same. There were small increases in production of rails, heavy structurals, and bars but other categories of nonflat products declined.

*Consumption.*—In terms of crude steel, apparent consumption (without regard to stock changes) increased 4.9 percent to 18,376,000 from 17,531,000 tons in 1966,

but real consumption reportedly increased by only 3 percent. Consumption was influenced by the relatively small increase in general economic activity, the decrease in private consumption, and the high activity in industries producing capital goods. Motor vehicle production was about the same as in 1966. Steel shipments to the domestic market were almost exactly the same as in 1966; increased consumption was met by imports. Domestic shipments in 1966 totaled 10,556,000 tons distributed as follows, in thousand tons: For conversion 2,694; to steel merchants 2,833; to manufacturing industries 2,864; to railroads, extractive industries, and building industry 1,166; others 173; and alloy steels 826.<sup>12</sup>

*Trade.*—France exported 5,918,000 tons of steel ingots, primary forms, and semi-manufactures and 644,900 tons of pipes and tubes; corresponding import figures were 4,870,000 tons and 244,850 tons. The net export of 1,048,000 tons for steel (excluding pipes and tubes) was less than in 1966 because of reduced shipments to West Germany. Imports accounted for 28 percent of domestic consumption against 22 percent in 1966. Trade in pig iron and similar products comprised 332,000 tons of exports and 246,000 tons of imports.

Other EEC countries were the largest markets and sources of steel. Imports of steel from these countries (4,655,782 tons) exceeded exports to them by 1,425,000 tons.

*Facilities and Investments.*—At the end of 1966, 44 companies produced steel in 58 plants. There were an additional 52 plants having no steelmaking capacity. Of the 58 steel-producing plants, two had annual capacity of 2 to 3 million tons, two of 1.5 to 2 million tons, five of 1 to 1.5 million tons, eight of 0.5 to 1 million ton, and the remaining 41, of less than 0.5 million tons each of annual capacity. The industry's investment in 1966 totaled about \$136 million; the corresponding 1967 expenditure was about \$186 million.

The French steel industry started its Plan Professionel de la Sidérurgie (Professional Plan for the Steel Industry) which envisages restructuring of the industry and rationalization in production. An agreement signed by the Government with Union Sidérurgique du Nord et de l'Est

de la France (Usinor), Société des Acières de Lorraine (Saclor), and Société Lorraine de Laminage Continue (Sollac) provides \$607 million out of the total \$911 million which under the plan will be made available by the Government to the industry at low interest rates. The sum loaned to these companies will be used for the purchase of equipment.

Since 1961, there have been five mergers between French steel companies. In 1966, Lorraine-Escaut and Usinor and their respective holding companies, Acières de Longwy and Denain Nord-Est, merged. The two holding companies formed a new company Denain-Nord-Est Longwy. The merged Usinor/Lorraine-Escaut, called Usinor, has 7 million tons of annual production capacity.

In December 1967, DeWendel et Cie, Sidélor, and Société Mosellane de Sidérurgie merged all mining and steel activities into Wendel-Sidélor which will have a capacity to produce 20 million tons of iron ore and 7.8 million tons of steel annually. The new firm will also take over both firms' interests in Sollac and the new steel plant at Gandrange being erected by Saclor, a joint subsidiary of De Wendel and Sidélor. This merger requires approval by the European Economic Community. De Wendel-Sidélor will emphasize expansion of the Gandrange complex and close marginal installations.

Early in 1967, a continuous merchant bar plant was put in service at Gandrange. Oxygen steelmaking facilities, a blooming mill stand, and a continuous billet stand will also be added. This plant will have a 1.6 million tons crude steel capacity.

In December 1967, The J. J. Carnaud et Forges de Basse-Indre put a second electrolytic tinning plant into operation with an annual capacity of 138,000 tons which can be increased to 214,000 tons per year by adding further plating tanks. The company's other plant at Laon has a 130,000-ton annual capacity. The new plant is France's fifth electrolytic tinning line, the others being operated by Sollac.<sup>13</sup>

France's tinplate consumption is estimated to have exceeded 450,000 tons and exports totaled 354,515 tons valued at \$156 million.

<sup>12</sup> Organization for Economic Cooperation and Development. The Iron and Steel Industry in 1966 and Trends in 1967. Paris, France, 1967, table 26.

<sup>13</sup> Tin International. May 1968, p. 110.

**Lead and Zinc.**—Refined lead and slab zinc consumption in 1967 totaled about 164,000 tons and 202,000 tons, respectively. Lead consumption was 5.3 percent less than in 1966, but zinc consumption was 4,000 tons more than in 1966.

Trade in lead in 1967 was as follows:

Form	Metric tons	
	Imports	Exports
Ore and concentrate.....	128,456	3,895
Scrap.....	4,515	9,615
Pig lead.....	39,605	18,021
Semimanufactures.....	748	895

Value of listed imports and exports totaled \$28.3 million and \$7.4 million, respectively. Imports of all categories exceeded 1966 levels; pig lead exports were nearly twice as much as in 1966, presumably because of higher domestic smelter output.

Zinc production declined 5 percent from the 1966 level, but was scheduled to reach 230,000 to 240,000 tons by 1970 when consumption is expected to reach 385,000 to 410,000 tons. With about 80,000 tons output in the Viviez and Creil plants, Vieille Montagne remained the leading zinc producer, followed by Compagnie Asturienne des Mines at Auby (about 70,000 tons) and Peñarroya at Noyelles-Godault (35,000 tons). The Noyelles-Godault plant will attain an annual production capacity of 80,000 tons of zinc and 120,000 tons of lead in 1968. Peñarroya also produced 90 tons of cadmium and 4,800,000 ounces of silver.

French trade in zinc in 1967 was as follows:

Form	Metric tons	
	Imports	Exports
Ore.....	332,140	219
Scrap.....	15,107	2,228
Zinc dust.....	4,154	1,479
Slab.....	34,047	12,129
Semimanufactures.....	4,947	2,051

While ore and scrap imports declined from 1966 levels, slab and semimanufacture imports increased. The value of the listed imports and exports totaled \$49 million and \$5.2 million, respectively.

Peñarroya, Europe's largest lead pro-

ducer, took over Société Française des Métaux et Alliages Blanc (MAB), one of France's leading consumers of heavy metal scrap<sup>14</sup> and merged with Minerai et Métaux, a marketing organization. MAB produces annually 60,000 tons of lead, zinc, aluminum, and copper from scrap in six plants.

**Nickel.**—There was a slight reduction in nickel output from the Havre refinery. A new company, Société Auxiliaire Minière du Pacifique, was formed in the latter part of 1967 to explore and exploit New Caledonian nickel deposits. Sixty percent of the new company's capital is held by French institutions and banks and 40 percent by International Nickel Company of Canada, Ltd. French organizations participating in the new company are Bureau de Recherches Géologiques et Minières, Banque Nationale de Paris, Ugine-Kuhlman, Compagnie de Mokta, and Compagnie Financière de Suez et de l'Union Parisienne among others.

**Tin.**—Tin consumption in 1967 was estimated at 10,350 long tons (10,100 tons primary and 250 tons secondary) distributed approximately as follows in percent: Tinsplating 56.7 white metal alloys 28.0, copper alloys 7.6, chemical products 4.1, semimanufactures 2.6, and miscellaneous 1.0.<sup>15</sup> Consumption in 1967 was about 250 tons less than in 1966 because of reduced use for producing bronzes, some white alloys, and antifirction metals. France imported 10,149 long tons of tin, 68 tons of tin alloys, 31 tons of tin scrap, and 38 tons of tin semimanufactures. Exports comprised 50 tons of tin, 104 tons of tin alloys, 18 tons of scrap, and 54 tons of semimanufactures.

Work continued on tin occurrences discovered in 1965 near Morbihan in Brittany. Vein deposits of the Cornish type were indicated.

**Tungsten.**—Work carried out by Bureau de Recherches Géologiques et Minière (BRGM), in association with Omnimines and Compagnie Métallurgique et Minière, on the tungsten occurrence at Salu (Ariège) has shown a minable deposit

<sup>14</sup> Société Minière et Métallurgique de Peñarroya. Paris, France, Exercice, 1967, p. 19.

<sup>15</sup> Dieppedalle & Seales. Statistique Etain 1967. Paris, France, Apr. 10, 1968, 4 p.

which will be equipped for exploitation. BRGM discovered the deposit in 1965.

**Uranium.**—France's reasonably assured and estimated additional uranium resources are estimated at about 59,000 tons for the price range below \$10 per pound.

France signed an agreement with Nigeria for the exploration of the Arlit deposit which is estimated to contain 20,000 tons of uranium. France guaranteed to take the entire output of the deposit for 30 years and was expected to pay a delivered price of \$8 per pound for the oxide. Compagnie Française des Minerais d'Uranium (in which Peñarroya has an important share) has 20 percent of the capital of Société des Mines de l'Air which will exploit the deposit. An annual output of 1,000 tons of uranium is expected by 1973.

The Dong Trieu mining company discovered a uranium deposit at Saint-Suplice (Haute Vienne) which is considered promising.

#### NONMETALS

The value of nonmetals production (excluding building raw materials and quarry products) in 1966, the latest year for

which data are available, totaled \$176 million. Potash, sulfur, and salt were the most important commodities and accounted for 53, 28, and 15 percent, respectively, of the total. Building raw material and quarry product output was valued at an additional \$534 million of which \$479 million was accounted for by material used in the building industry and the remainder by other industry and agriculture.

The value of nonmetal imports and exports, including cement and lime, in 1967 totaled \$308 million and \$278 million, respectively. Among imports, phosphates (\$48 million), asbestos (\$19 million), clay including refractory (\$14 million), building stones (\$12 million), and sand and gravel (\$7 million) were the most important items. Sulfur, potash in chemically treated forms, and cement exports were valued at \$42 million, \$40 million, and \$17 million, respectively. Next in importance were sand and gravel and crushed rock (\$9 million) and clays (\$8.5 million).

**Cement and Lime.**—Production of cement by types in recent years has been as follows:

Type	Thousand metric tons				
	1962	1963	1964	1965	1966
Portland.....	11,757	12,647	16,227	16,844	18,031
Slag.....					
Blast furnace.....	2,203	2,485	2,333	2,400	2,341
Other.....	826	1,448	1,144	1,239	1,211
Special.....	1,475	749	983	1,050	1,001
Total.....	16,061	17,329	20,687	21,534	22,584
Natural.....	397	275	255	213	81
Mortar.....	424	530	595	619	638
Grand total.....	16,882	18,134	21,537	22,365	23,304

<sup>1</sup> Details do not add to total shown because of independent rounding.

At yearend 1967, France had an annual cement production capacity of 31.2 million tons, 2.7 million tons more than at yearend 1966. This increase was achieved by the addition of six new kilns of which three were in three new plants with 880,000 tons total annual capacity and three with 710,000 tons annual capacity in existing plants. Plant improvements accounted for an additional 1,100,000 tons of annual capacity.

Apparent consumption totaled 23,920,000 (22,598,000 tons in 1966) and per capita consumption 480 kilograms.

**Feldspar.**—Société des Feldspaths du Midi (Perpignan) and Compagnie des Feldspaths S.A. (Bayonne) merged into Société Française des Feldspaths S.A. The latter now has three feldspar plants and will attempt to find export markets.<sup>16</sup>

<sup>16</sup> Mines et Métallurgie. (Paris, France), No. 3, January 1968, p. 6.



**Fertilizer Materials.**—Principal developments have been changes in the structure of the industry. The State-owned Mines Dominales de Potasse d'Alsace and the nitrogen production agency Office National Industriel de l'Azote (ONIA) were merged in 1967 into l'Entreprise Minière et Chimique. The new company has three subsidiaries that will be concerned with potash mining, chemical fertilizer production, and sales. The new company will have an annual turnover of about \$220 million and will employ 16,000 in the two mining and fertilizer subsidiaries. ONIA produced 297,000 tons of ammonia in 1966.

On December 29, 1966, Société des Produits Azotes merged with Société d'Electro-Chimie d'Electro-Metallurgie et des Acières Electriques d'Ugine (Ugine). On the same date, the latter company itself was merged with Etablissements Kuhlman forming Ugine-Kuhlman. Ugine-Kuhlman had a net turnover of \$565 million in 1966 (\$635 million with tax). Chemicals accounted for 55.2 percent of the net turnover; special steels, nonferrous metals, ferroalloys, and other products accounted for the remainder. The new firm will produce 25 percent of France's sulfuric acid, 17 percent of its ammonia, and 20 percent of its aluminum.

Wintershall A.G., the largest potash producer in West Germany, and Mines Dominales de Potasse d'Alsace signed an agreement creating a new joint subsidiary, Produits et Engrais Chimiques de Rhin (PEC-Rhin). This firm will build a nitrogenous and compound fertilizer plant, due for completion in 1969, at Ottmarsheim near Mulhouse in the Haut-Rhin area of France. The plant will have facilities to produce 600 tons of ammonia and 900 tons of nitric acid per day as well as 300,000 tons of compound fertilizers and 100,000 tons of ammonium nitrate per year. The total cost of the project is estimated at \$60 million.

L'Ammoniac Sarro-Lorraine, a joint subsidiary of Charbonnages de France (Houillères du Bassin de Lorraine) of France, and Saarbergwerke of West Germany, will build a 1,000-ton-per-day ammonia plant at Carling in the Moselle area of France. Naphtha for ammonia production will be supplied by the Saar refinery in which Charbonnage de France and Saarbergwerke participate.

Another ammonia plant of similar capac-

ity will be built by Société Normande de l'Azote (SNA) near the petroleum refinery of Compagnie Française de Raffinage at Le Havre. The latter company, ONIA, and Pierrefitte Company participate in SNA. The plant is planned to start in 1968.

Permission for the erection of another 1,000-ton-per-day ammonia plant to be built near the Ile-de-France refinery at Grandpuits was granted in October. The plant is scheduled to come into operation in 1969.

On the production side, there was little change in potash output. Production data on other fertilizer materials follows:

Commodity	Output (metric tons)
Nitrogenous:	
Ammonia.....(nitrogen content)...	1,453,100
Fertilizer.....(nitrogen content)...	1,305,900
Phosphatic:	
Superphosphate.....	1,424,400
Ground phosphates.....	717,600
High phosphorus.....	561,600
Phosphatic slag (crude).....	2,583,600
Compound.....	564,000

**Fluorspar.**—Discovery of a fluorspar deposit in the northern rim of the Morvan massif by Pechiney geologists has been reported. The deposit has an estimated 3 million ton reserves averaging 35 percent calcium fluoride.

#### MINERAL FUELS

Total energy consumption in 1967 increased 5.6 percent compared with that of 1966, with the increase supplied principally by petroleum products.

**Coal.**—*Production.*—Production of coal (anthracite and bituminous) declined 5.4 percent below the 1966 level. All fields showed a decline, but the 1,848,000-ton decline in production by Nord/Pas-de-Calais alone accounted for 68 percent of the total falloff. The Lorraine field increased its share of national output to 31.6 percent (30.7 in 1966). Nord/Pas-de-Calais remained the largest producing area with 49.2 percent of total output. The Fifth Plan (1966–70) revised the coal (excluding lignite) production target of 48 million tons to 46.5 million tons in 1969–70.

Coal production by extraction method in 1967 (corresponding 1966 figures in

parentheses) was as follows, in percent: pickhammer only 17.0 (20.7), mechanical cutter with use of explosives and pickhammer 21.7 (21.5), explosives alone 25.3 (24.5), pickhammer and explosives 9.2 (9.8), blasting by compressed air 1.4 (2.3), plough and plough scraper 23.7 (20.6), and other 1.7 (0.6). Thus, there has been an increased extraction by ploughs and slight increase in mechanical cutter-loaders and decline in extraction by pickhammers. The number of coal ploughs in service increased from 231 in 1966 to 242, but the number of pickhammers declined from 15,770 to 14,550 and of longwall coal cutters from 85 to 52. Other coal cutting equipment in service (rotary drills, cutter-loaders, etc.) did not change much. Very few ploughs are used in the Lorraine field. This mining method has its greatest development in the Nord/Pas-de-Calais field.

Mechanized mines produced 65.7 percent of net coal mined underground in October 1967 (65.7 percent in 1966), while semi-mechanized mines contributed 17.1 percent (20.1 percent in 1966). At the face, nearly 80 percent of the coal output was conveyed by scraper conveyors and 9 percent by gravity. There was an average of 640 coal faces in operation in 1967 with an average length of 142 meters. Average daily production per face was 276 tons. Consumption of electricity per ton of coal produced, excluding that for ventilation, further increased to 6.80 kilowatt-hours (6.50 in 1966).

Of 67 coal mines in operation in 1966, three mines had an average daily production of 8,000 tons and over, 11 produced 4,000 to 8,000 tons per day, 39 produced 1,000 to 4,000 tons, and the remainder less than 1,000 tons per day.

In 1967, 88.0 percent of run of mine production was washed. The products consisted of 43.7 percent delivered marketable coal, 35.3 percent rejects, 6.5 percent middling, and 2.5 percent slime. Of the total coal washed, 54.4 percent was treated in heavy media, 35.5 percent in piston jigs, 9.2 percent in flotation cells, 0.6 percent on pneumatic tables, and 0.3 percent by miscellaneous facilities. There were some 50 washing plants in operation.

*Consumption and Trade*—Apparent consumption of coal and lignite declined; domestic output decreased by 2.7 million tons and 1.2 million tons of the coal

output was added to stocks, while coal imports increased only 72,000 tons and lignite output advanced by only 367,000 tons. Shipments of domestic and imported coal for making coke totaled 16.3 million tons and those to electricity producers were 18.3 million tons. Household and small industries received 7.5 million tons of coal and, presumably the bulk of the briquets produced from 4.6 million tons of domestic and imported coal.

Coal imports (including anthracite) have shown little variation in the last 3 years, averaging about 11,700,000 tons per year. In 1967, principal suppliers were West Germany (5,794,000 tons) United States (2,154,600), U.S.S.R. (1,467,000 mainly anthracite), Poland (651,000), and United Kingdom (566,000). Average c.i.f. value per ton was \$15.18 for bituminous and \$25.82 for anthracite.

*Coke and Coal Chemicals*.—Coke ovens of Charbonnage de France accounted for 64 percent of total coke output. Coke shipments, domestic and imported, totaled 14,846,000 tons, of which 3,235,000 tons was imported coke. Shipments to the iron and steel industry accounted for 81 percent and to other industries, 12 percent; the remainder was shipped to domestic and small industrial consumers.

Charbonnage de France continued to expand its chemical activities, establishing, as of January 1, 1968, the Société Chimique des Charbonnages to take over its entire chemical production and sales activities. The new company will own and operate the 30 chemical plants that had a 1966 turnover of about \$260 million. Three subsidiaries, CdF Chimie, le Comptoir français de l'Azote, and Engrais de France, will market the products. CdF Chimie's 1967 turnover totaled about \$50 million; sales included coal tars and chemicals, nonaromatic organics, methane, and polyesters.

At the end of the Fifth Development Plan, the Société Chimique will turn out 2,600 tons of ammonia daily and increase its output of polyethelene, styrene, and acrylic products.<sup>17</sup> The company has a 600-ton-per-day ammonia plant at Mazin-garbe and in 1967 obtained permission to build a 1,000-ton-per-day ammonia plant at Grandpuits, scheduled for operation in 1969.

<sup>17</sup> Colliery Guardian. Mar. 24, 1967, p. 320.

Table 8.—France: Energy consumption by sources

Type of fuel	1963	1964	1965	1966	1967
<b>Quantity:</b>					
Solid fuel					
million tons of standard coal equivalent...	75.2	75.2	68.9	63.7	63.9
Petroleum products.....do.....	57.0	66.4	73.4	79.5	90.8
Gas.....do.....	7.8	8.3	8.4	8.8	9.5
Hydroelectric power.....do.....	17.8	15.0	19.2	22.4	20.0
Total.....do.....	157.8	164.9	169.9	174.4	184.2
<b>Share of total:</b>					
Solid fuel.....percent.....	47.6	45.6	40.5	36.5	34.7
Petroleum products.....do.....	36.2	40.3	43.2	45.6	49.3
Gas.....do.....	4.9	5.0	5.0	5.0	5.1
Hydroelectric power.....do.....	11.3	9.1	11.3	12.9	10.9
Total.....do.....	100.0	100.0	100.0	100.0	100.0

<sup>r</sup> Revised.

Source: Comité Professionnel du Pétrole. Éléments Statistiques, Activité l'Industrie Pétrolière 1967. Paris France, V. 1, 1967, p. A. 12.

Table 9.—France: Salient statistics of the coal and lignite industry

(Thousand metric tons unless otherwise specified)

	1963	1964	1965	1966	1967
<b>COAL</b>					
<b>Production:</b>					
Anthracite.....	3,053	3,373	3,621	3,541	2,880
Semianthracite.....	7,869	8,912	8,798	9,140	9,152
Bituminous:					
Low volatile <sup>1</sup> .....	5,249	5,247	4,378	4,084	3,715
Medium-volatile <sup>2</sup> .....	12,392	13,317	12,941	13,140	12,415
High-volatile <sup>3</sup> .....	16,686	19,117	18,465	17,527	16,561
High-volatile <sup>4</sup> .....	2,504	3,064	3,115	2,955	2,901
Total <sup>5</sup> .....	47,762	53,042	51,348	50,338	47,625
Apparent consumption (including lignite)					
thousand tons of standard coal equivalent.....	77,100	74,400	69,100	64,200	<sup>e</sup> 63,700
Stocks at yearend.....	6,123	5,703	7,402	10,476	11,723
Number of operating mines.....	NA	77	<sup>r</sup> 70	67	<sup>e</sup> 63
Average number of days worked.....	256	278	<sup>r</sup> 274	275	260
Average daily output.....metric tons.....	186,500	190,400	<sup>r</sup> 187,000	183,400	183,300
Number of men working daily at yearend:					
Underground.....persons.....	115,090	110,900	107,694	102,959	94,292
Surface.....do.....	46,795	44,951	43,352	41,504	39,679
In associate plants.....do.....	9,894	9,807	8,937	8,921	8,625
Production per man-shift:					
Nord/Pas-de-Calais:					
Underground.....kilograms.....	1,663	1,709	1,661	1,707	1,805
Underground and surface.....do.....	1,149	1,191	1,167	1,205	1,252
Lorraine:					
Underground.....do.....	2,903	3,113	3,239	3,453	3,703
Underground and surface.....do.....	1,902	2,078	2,146	2,277	2,443
All of France:					
Underground.....do.....	1,958	2,046	2,038	2,104	2,241
Underground and surface.....do.....	1,332	1,411	<sup>r</sup> 1,397	1,446	1,523
Power production by pithead steam plants:					
Quantity.....million kilowatt-hours.....	10,931	14,762	12,146	10,233	11,812
Share of thermal power produced					
in France.....percent.....	24.4	25.0	22.1	18.8	17.7
Share of total power produced in					
France.....do.....	12.4	15.7	12.0	9.6	10.6
<b>LIGNITE</b>					
Production.....	2,471	2,244	2,690	2,564	2,931
Stock at yearend.....	485	456	<sup>r</sup> 452	520	379
Average number of days worked.....	256	259	274	274	260
Average daily output.....metric tons.....	9,700	8,600	9,800	9,300	10,400
Number of men working at yearend:					
Underground.....percent.....	1,853	1,780	1,662	1,582	1,515
Surface.....do.....	1,066	1,030	1,046	1,051	1,053
Associated plants.....do.....	146	111	115	125	130
Production:					
Underground man-shift only.....kilograms.....	3,890	4,103	4,243	4,477	4,870
Total man-shifts.....do.....	3,579	3,334	<sup>r</sup> 3,938	NA	NA

<sup>e</sup> Estimate. <sup>r</sup> Revised. NA Not available.

<sup>1</sup> Largely 14 to 18 percent volatile matter; a small tonnage has a higher volatile content.

<sup>2</sup> 16 to 28 percent volatile matter.

<sup>3</sup> 25 to 41 percent volatile matter.

<sup>4</sup> 40 to 42 percent volatile matter for the bulk of production in this category.

<sup>5</sup> Detail does not add to total (official data) because of differences in source.

**Table 10.—France: Coal availability and distribution**

	(Thousand metric tons)	
	1966	1967
Net production.....	50,338	47,624
Middlings, foreign coal, etc.....	173	151
Stock variations <sup>1</sup> .....	+3,068	+1,205
Total availability.....	47,443	46,570
Consumption by mines and mine powerplant.....	6,888	7,419
Delivery to miners.....	384	301
Delivery for transformation:		
Mine coke ovens.....	9,876	9,370
Steel plant coke ovens.....	2,203	2,222
Gas coke ovens.....	257	84
Briquetting plants.....	3,784	3,733
Total.....	23,892	23,629
Exports.....	670	711
Total available from domestic production.....	22,881	22,237
Imports.....	11,485	11,557
Delivery from imports:		
Coal mine coke ovens.....	801	851
Steel plant coke ovens.....	3,351	3,322
Gas coke ovens.....	474	405
Briquetting plants.....	1,050	831
Delivery to mines.....	39	7
Stock variations <sup>1</sup> .....	+369	+147
Available from imports.....	5,401	5,994
Available for domestic distribution.....	28,282	28,231
Railroads.....	1,205	790
Gasworks.....	20	11
Electricity.....	9,406	10,860
Iron and steel.....	1,761	1,848
Other industries.....	8,052	7,199
Domestic and small industries.....	7,838	7,523

<sup>1</sup> Plus (+) denotes addition to stocks.

<sup>2</sup> Includes 7 tons of foreign coal.

**Petroleum.**—Domestic petroleum production in 1967 was 3.8 percent of total national refinery throughput (4.4 percent in 1966 and 4.9 percent in 1965), which increased 12.1 percent to 75.2 million tons. In spite of the Middle East crisis, internal civilian consumption of petroleum products increased by 13.9 percent to 56.7 million tons compared with increases of 7.3 percent in 1966 and 11.6 percent in 1965. The net cost of imports of petroleum and petroleum products to the French economy totaled \$1,150 million. Refinery capacity was increased by 4.6 million tons to a total of 84 million tons by yearend 1967. Refinery output totaled 69 million tons.

**Exploration.**—During the year 79.3 man-months of seismic work and 120,000 meters of drilling was carried out in France compared with 75.8 man-months of seismic work and 130,000 meters of drilling in 1966. Exploration was centered in the

**Table 11.—France: Production, availability, and distribution of coke**

	(Thousand metric tons)	
	1966	1967
Coal charged to coke ovens:		
Domestic.....	12,792	12,083
Imported.....	4,685	4,650
Total.....	17,477	16,733
Production:		
Oven coke:		
At mines: <sup>1</sup> .....	3,451	8,040
At iron and steel plants.....	4,183	4,166
At gas companies and independents.....	566	424
Total.....	13,200	12,630
Gas coke.....	14	9
Availability and distribution:		
Coke produced <sup>1</sup> .....	13,200	12,630
Receipt of coke and fines.....	60	---
Consumption at coking plants and by labor.....	800	772
Available for distribution.....	12,460	11,859
Stock variation <sup>2</sup> .....	+108	+38
Imports.....	3,701	3,220
Importers' stock variation <sup>2</sup> .....	-73	-18
Total available from domestic production and imports.....	16,126	15,059
Delivery to coking plants.....	59	3
Exports.....	217	210
Distribution:		
Railroads.....	67	57
Electricity.....	10	15
Iron and steel.....	12,844	12,061
Other industries.....	1,889	1,801
Domestic use and small industries.....	1,040	912
Total.....	15,850	14,846

<sup>1</sup> Includes semicoke and carbonized briquets.

<sup>2</sup> Plus (+) denotes addition to stocks, minus (-) denotes withdrawals from stocks.

Source: Bureau de Documentation Minière. Combustibles Minéraux Solides. Statistique Annuelle Définitive. Paris, France, pt. 2, 1963-67.

Paris region and the southeast. In this latter area, deep drilling showed gas reserves in the Meillon-Saint Faust field amounting to perhaps 60 billion cubic meters. Offshore, four deep holes were drilled in the Gulf of Gascony, but commercial oil was not discovered. Oil was discovered in an exploration well, Chailly 101, in the Paris Basin.

Outside France, French companies explored for oil in Africa, North America, the North Sea (in the continental shelves of United Kingdom and Norway), and the Persian Gulf; in offshore areas in the Adriatic and off the coasts of Gabon,

Cameroon, and Senegal; and in the Red Sea. These exploration activities gave positive results in Canada and Nigeria.

*Production.*—In France, there was a slight decline in crude production, but the output of the Franc zone, excluding France—Algeria, Congo (Brazzaville), and Gabon—increased to 41.89 million tons (34.77 million tons in 1966): Algeria 38.39 million, Gabon 3.45 million, and Congo (Brazzaville) the remainder. French companies accounted for 28 million tons of crude production in the Middle East and produced 700,000 tons in Canada.

*Consumption.*—While internal civilian consumption for all products increased by 13.9 percent, rate of increase varied for the different products as shown by the following tabulation:

Product	Quantity (thousand tons)	Change with respect to 1966 (percent)
Motor gasoline.....	9,881	8.9
Gas oil.....	3,503	12.3
Jet fuel.....	1,092	18.4
Aviation gasoline.....	72	-1.1
Domestic fuel oil.....	19,577	22
Residual fuel.....	15,204	11

French companies accounted for 51 percent of the internal market and non-French companies for 49 percent. The share of the market for selected products by French and non-French companies was as follows:

Product	Share (percent)	
	French	Non-French
Gasoline.....	47.3	52.7
Gas oil.....	53.8	48.2
Heating oil.....	51.4	48.6
Medium fuel.....	46.3	53.7
Heavy fuel.....	48.3	51.2

Source: Petroleum Intelligence Weekly, Apr. 15, 1968, p. 6.

A decree of July 8, 1967 permitted price increases of about 1.5 cents per gallon for gasoline and half as much for gas oil and domestic fuel oil to account for increased transportation costs resulting from the June crisis in the Middle East. Price of domestic fuel oil was increased again by 0.75 cent per liter in November. Revenues obtained from these price increases were deposited in a special account

that was to be used to compensate companies for extra expenditures borne by them as a result of the increased tanker freight charges.

*Trade.*—Crude oil imports increased by 15 percent to 72,348,000 tons despite the Middle East crisis. Sources for imports were as follows, in percent: Franc zone 30.6, Middle East 48.1, Libya 12.1, Venezuela 3.9, U.S.S.R. 2.3, and Nigeria 3.0. Product imports totaled 4.9 million tons, a 4.2-percent increase. Algeria ranked first as a supplier of crude, followed by Iraq and Kuwait.

Exports, including bunkers, declined 0.5 percent to 14,294,500 tons (12,593,700 tons without bunker).<sup>18</sup> Of the exports, excluding bunkers, heavy fuel oil ranked first (4,972,300 tons), followed by gas oil (2,866,200 tons) and gasoline (1,620,800 tons).

*Refining.*<sup>19</sup>—Of the 75 million tons of crude treated in French refineries, French crude accounted for 3.8 percent, but total Franc-zone crude for almost a third. Of the 70.4 million tons of product output, 40.8 million tons was fuel oil; gasolines were next in importance.

Increase in refining capacity resulted from the addition of a 6.5-million-ton-per-year distillation unit at Gonfreville, making this refinery, with annual capacity of 14.3 million tons, the largest in France and the third largest in Europe. The Donges and Herrlisheim refineries were also expanded.

In 1968, annual capacity of the Feyzin refinery will be enlarged from 2.3 to 6 million tons, that at La Mède from 6.4 to 10 million tons, and a new 3.6 million-ton refinery will be built at Gargenville in the Paris area. Three other refineries, each with 3 to 3.5 million tons of annual capacity, will be put in service during 1969-70; these will be located at Valenciennes, Vernon, and Thionville.

Storage capacity at refineries reached 22 million cubic meters and at distributors 5.5 million cubic meters. Underground crude storage was under consideration.

To meet input requirements of the petrochemical industry, two steam cracking units came into operation, one at Feyzin and one at Port-Jerome; a third unit will come in production at Berre in 1968.

<sup>18</sup> This figure is slightly different from that given in table 3 because of different sources.

<sup>19</sup> Bulletin de l'Industrie Pétrolière (Paris, France). No. 996, Jan. 3, 1968, pp. 5-10.

The units which started production will increase the output of ethylene, propylene, benzene, and butadiene. The plant at Feyzin will reach its capacity of 280,000 tons of ethylene per year in 1970 and will become France's biggest producer of ethylene, followed by Esso (200,000 tons) and Naphachimie (150,000 tons). Ethylene from the Feyzin plant will be fed by a 278-kilometer pipeline into chemical factories that shared the cost of the Feyzin cracker.

*Transportation.*—The South European Pipeline transported 28 million tons of crude, of which one-third was for French

consumption. The two products pipelines, Le Havre-Paris and Grandpuits-Paris, moved 6,250,000 tons of products to the Paris region. The construction of a product pipeline from the refineries in the Marseille area and from Feyzin to Lyon, Grenoble, and Geneva was approved during 1967.

The French tanker fleet at yearend, consisted of 90 ships totaling 3,929,000 deadweight tons (3,687,000 tons in 1966). Another 17 tankers, varying in size from 75,000 to 215,000 tons, were under construction.

**Table 12.—France: Salient statistics of petroleum and natural gas industry**

(Thousand metric tons unless otherwise specified)

	1963	1964	1965	1966	1967
<b>Exploration Drilling:</b>					
Length of hole drilled..... thousand meters..	237	189	182	130	120
<b>Production:</b>					
Crude petroleum.....	2,522	2,845	2,988	2,925	2,832
Natural gas..... million cubic meters..	7,518	7,939	7,910	7,902	8,552
Marketed..... do.....	4,861	5,090	5,048	5,161	5,563
<b>Products obtained from refining natural gas:</b>					
Liquefied products.....	438	490	569	503	480
Sulfur.....	1,409	1,511	1,521	1,520	1,636
<b>Refining:</b>					
Number of refineries..... units..	15	16	18	19	19
Capacity of refinery (atmospheric distillation)...	51,830	61,930	70,230	79,130	83,805
Refinery throughput.....	46,702	53,284	61,359	67,060	75,202
<b>Refinery production:</b>					
Aviation gasoline.....	69	66	72	74	71
Motor gasoline.....	7,943	8,643	9,560	10,247	11,420
Special gasolines.....	246	263	317	179	210
Kerosine and white spirits.....	404	260	194	226	233
Light distillates for gasworks.....	177	562	809	1,137	1,533
Jet fuels.....	1,542	1,662	1,850	1,834	2,388
Distillate.....	4,756	5,091	5,997	6,605	6,278
<b>Fuel oil:</b>					
Domestic.....	8,609	10,691	13,493	15,785	18,396
Residual.....	14,643	16,623	19,069	20,171	22,398
Bitumen.....	1,777	2,172	2,219	2,389	2,638
Lubricants.....	813	871	821	866	930
Paraffins and waxes.....	42	49	48	57	57
Petrochemical feedstock.....	503	582	691	677	861
Liquefied petroleum gas.....	1,352	1,487	1,644	1,732	1,896
Refinery gases.....	1,105	1,279	733	922	944
Other.....	113	75	79	140	90
<b>Total.....</b>	<b>44,094</b>	<b>50,376</b>	<b>57,596</b>	<b>63,139</b>	<b>70,443</b>
<b>Foreign trade:</b>					
<b>Imports:</b>					
<b>Crude:</b>					
<b>Franc zone:</b>					
Algeria.....	15,215	17,113	17,386	18,492	21,599
Other.....	784	834	1,114	725	611
Subtotal.....	15,999	17,997	18,500	19,218	22,210
<b>Middle East:</b>					
Iran.....	2,038	3,441	5,923	4,169	3,215
Iraq.....	9,260	8,079	9,314	10,401	13,576
Kuwait.....	8,083	9,799	8,314	8,357	8,895
Qatar.....	1,194	1,311	1,292	1,676	2,049
Saudi Arabia.....	1,793	1,945	2,546	3,071	4,279
Abu Dhabi and others.....	466	1,453	1,802	2,777	2,802
Subtotal.....	22,834	26,028	30,190	30,452	34,815

See footnotes at end of table.

Table 12.—France: Salient statistics of petroleum and natural gas industry—Continued

(Thousand metric tons unless otherwise specified)

	1963	1964	1965	1966	1967
Foreign trade—Continued					
Imports—Continued					
Crude:—Continued					
U.S.S.R.-----	114	92	836	1,653	1,629
Venezuela-----	2,649	2,595	2,668	2,402	2,800
Libya-----	1,661	2,290	5,863	7,280	8,729
Other-----		273	499	1,747	2,165
Total-----	43,257	49,275	58,556	62,752	72,348
Products imports-----	4,276	4,594	3,905	4,733	4,809
Exports of products including bunkering and custom refining-----	7,955	8,955	11,440	14,367	14,295
Consumption:					
Internal market-----	35,921	41,642	46,470	49,980	56,947
French bunkering-----	1,339	1,376	1,213	1,294	1,388
Other consumption including refinery and distribution losses (approximate)-----	5,000	5,000	5,500	6,000	6,800
Stock:					
In refinery-----	11,774	14,219	16,614	20,645	21,595
In distribution channels-----	4,540	5,161	5,763	5,294	5,959
Transportation:					
Tankers:					
Units-----	93	93	92	90	90
Deadweight tons-----	2,945	3,088	3,401	3,637	3,929
Tank cars:					
Units-----	16,150	18,719	19,461	19,601	19,460
Capacity----- thousand cubic meters--	620	782	835	862	885
Tank trucks:					
Units-----	8,248	10,220	11,677	12,850	14,030
Capacity----- thousand cubic meters--	100	126	141	159	177
Employment:					
Exploration and production----- persons--	11,043	10,503	10,347	10,862	NA
Refinery----- do--	15,895	16,266	16,125	16,208	NA
Distribution (estimated)----- do--	34,600	39,590	39,990	40,050	NA
Other----- do--	1,355	1,436	1,485	1,539	NA

<sup>r</sup> Revised. NA Not available.<sup>1</sup> Detail does not add to total shown because of independent rounding.Sources: Comité Professionnel du Pétrole. *Éléments Statistiques, Activité de l'Industrie Pétrolière*. For the years 1963-66. V. 1, Paris, France; and Statistical Office of the United Nations.

**Natural Gas.**—The Lacq field remained the main source of natural gas consumed in France, accounting for 95 percent of the total marketed. By yearend 1967 the field had produced 60 billion cubic meters of gas from initial reserves of 200 billion cubic meters. Daily capacity for treatment of gas from Lacq and other gasfields of Société National des Pétroles d'Acquitaine will be increased from 24 million cubic meters to 26 million cubic meters in 1968 and 34 million cubic meters by 1970. These other fields—Meillon, Sanit-Faust, Pont d'As and Rousse—discovered in the last 3 years, are estimated to have a combined 85 billion cubic meters of measured reserves.

Natural gas sales<sup>20</sup> totaled 5,555 million cubic meters including industry, 3,724.3

million (of which powerplants 866.8 million), town gas, 1,795.8 million; and gasoline production, 35.0 million.

Imports of Dutch natural gas started in October 1967 and totaled 151 million cubic meters. Imports from this source will increase to 5,000 million cubic meters per year. Algerian natural gas has been imported in liquefied form at the rate of 500 million cubic meters annually, but starting in 1970 additional imports will become available from Algeria, increasing to 3.5 billion cubic meters in 1973. In 1967, 746,452 cubic meters (346,310 tons) of liquefied natural gas was imported.

<sup>20</sup> As distinct from gas delivered for consumption which would include addition to stocks.

