



2019 Minerals Yearbook

FRANCE [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF FRANCE

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France no longer mined metals, mostly because mineral deposits that were historically important for the country's economy were no longer economically viable for extraction. The country was a significant processor of metals (aluminum, cobalt, indium, pig iron, lead, nickel, and zinc) and a major producer of industrial minerals (gypsum, lime, mica, and pumice). France was the world's fifth-ranked producer of talc (7.3% of global output) (table 1; U.S. Central Intelligence Agency, 2021; Bolen, 2021).

Minerals in the National Economy

In 2019, France had the seventh largest economy in the world in terms of its nominal gross domestic product (GDP) at \$2.72 trillion and the second largest economy in the European Union (EU) after Germany. France's real GDP increased by 1.5% in 2019. The industrial sector contributed 17.1% of the GDP, and the manufacturing sector contributed 9.82% of the GDP. The industrial sector (including construction) accounted for 20.1% of all employment, which was approximately 5.6 million people (World Bank, The, 2020a–c).

Government Policies and Programs

The mineral industry of France is regulated by the French Mining Code, including Decree No. 2006–648, Decree No. 2006–649, and Decree No. 80–331. Exploration and extraction of mineral resources require both a mining title and an operation permit. The Minister of Economy and Finance is responsible for issuing and regulating mining titles through the raw materials policy of Decree No. 2017–1078. The raw materials policy is enforced through the Directorate-General for Enterprises; the Directorate-General for Planning, Housing, and Nature; and the Directorate-General for Risk Prevention. In 2017, the Government adopted Act No. 2017–1839 to ban new exploration for hydrocarbons to comply with the objectives of the 2015 Paris Agreement on climate change. Decree No. 2018–434 of June 4, 2018, regulates protection from radiation for mine workers' safety. To simplify implementation, law No. 2018–727 of August 10, 2018, allows the Government to reform the provisions of the Mining Code with respect to granting and extending licenses for the exploration of potential geothermal energy locations and the operation of associated facilities. Other Government agencies that were involved in the establishment of raw materials policy included the Directorate-General for Research and Innovation, which was under the Ministry of Higher Education, Research and Innovation; the Directorate-General for Globalization, Culture, Education and International Development, which was under the Ministry of Europe and Foreign Affairs; and the Directorate-General of the Treasury, which was under the Ministry of Economy and Finance (MinéralInfo, 2017; Legifrance, 2018; Clément and others, 2019).

Production

In 2019, major increases in production included that of cobalt, which increased by 317%; refined nickel, by 89%; silicomanganese, by 19%; granite, by 15%; primary aluminum, by 13%; and dimension stone (marble), by 12%. Major decreases in production included that of mined gypsum, and silicon metal, by 28% each; crushed limestone, by 14%; refined indium, by 13%; and petroleum refinery throughput, by 10%. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Bureau de Recherches Géologiques et Minières is the Government agency that performs geologic and mineral research in France and abroad. Several major French mineral-producing companies had operations in France and abroad. Eramet S.A. mined mineral sands (zircon and ilmenite) in Senegal, nickel in New Caledonia, and manganese in Gabon, and produced manganese alloys, refined cobalt, and refined nickel in 20 countries. Imerys S.A.—which was the world's leading producer of industrial minerals—mined and processed bentonite, diatomite, graphite, kaolinite, mica, perlite, and wollastonite domestically and from deposits in such countries as China, Germany, the United Kingdom, and the United States. Total S.A. produced crude petroleum, natural gas, and petrochemicals worldwide (Eramet S.A., 2020a, p. 7, 10, 16, 17; Imerys S.A., 2020, p. 13, 245, 246; Total S.A., 2020, p. 3). Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2019, France's total exports and imports were valued at \$570 billion and \$651 billion, respectively. Exports and imports of mineral products (as defined by Harmonized Standard (H.S.) codes 25 through 27) were valued at \$16.8 billion and \$69.6 billion, respectively. The value of France's exports of mineral fuels and products was \$15.5 billion, and of this amount, exports of crude petroleum totaled \$38.9 million. France's top five export partners for crude petroleum were the United Kingdom (which received 94% of France's crude petroleum), Germany (4.6%), and Austria, Côte d'Ivoire, and Spain together (1%). Of the exports of mineral fuels and products, the value of exports of refined petroleum was \$8.39 billion. France's top five export partners for refined petroleum were Belgium (which received 19% of France's refined petroleum), the Netherlands (15%), Germany (9.4%), the United States (8.2%), and Switzerland (5.8%). Of the exports of mineral fuels and products, exports of petroleum gases and hydrocarbons were valued at \$2.98 billion. In 2019, France's top five export partners for petroleum gas and hydrocarbons were Italy (which received 47% of France's petroleum gases and hydrocarbons), Spain (32%), Switzerland (5.8%), Belgium (3.0%), and Morocco (1.6%) (United Nations Statistics Division, 2022).

The value of France's imports of mineral fuels and products was \$66.1 billion. Of this amount, imports of crude petroleum totaled \$24.5 billion. France's top five import partners for crude petroleum were Saudi Arabia (which provided 15% of France's crude petroleum), Kazakhstan (14%), Nigeria (14%), Russia (12%), and Algeria (11%). Of the imports of mineral fuels and products, the value of imports of refined petroleum was \$24.0 billion. France's top five import partners for refined petroleum were Russia (which provided 14% of France's refined petroleum), Saudi Arabia (13%), Belgium (13%), the Netherlands (8.1%), and Spain (5.9%). Of the imports of mineral fuels and products, imports of petroleum gas and hydrocarbons were valued at \$13.4 billion. France's top five import partners for petroleum gases and hydrocarbons were Belgium (which provided 50% of France's petroleum gases and hydrocarbons), Algeria (9.7%), Russia (9.2%), Nigeria (7.1%), and Germany (7.0%) (United Nations Statistics Division, 2022).

In 2019, the value of France's exports of ferrous metals and articles thereof was \$22.3 billion. In 2019, France's top five export partners for ferrous metals and articles thereof were Germany (which received 20% of France's iron, steel, and articles thereof), Spain and Belgium (11% each), Italy (9.7%), and the United States (4.9%). The value of France's imports of ferrous metals and articles thereof was \$23.7 billion. France's top five import partners for iron, steel, and articles thereof were Germany (which provided 21% of France's iron, steel, and articles thereof), Belgium (19%), Italy (15%), Spain (11%), and the Netherlands (5.4%) (United Nations Statistics Division, 2022).

The value of exports of base metals and articles thereof was \$10.6 billion. Of this amount, exports of aluminum and articles thereof totaled \$5.25 billion; copper and articles thereof, \$2.82 billion; nickel and articles thereof, \$762 million; zinc and articles thereof, \$561 million; lead and articles thereof, \$189 million; and tin and articles thereof, \$62.5 million. In 2019, France's top five export partners for base metals and articles thereof were Germany (which received 15% of France's base metals and articles thereof), the United States (9.7%), Spain (7.0%), Belgium (6.6%), and Italy (5.2%). The value of imports of base metals and articles thereof was \$16.3 billion. Of this amount, the value of imports of aluminum and articles thereof was \$6.96 billion; copper and articles thereof, \$3.41 billion; nickel and articles thereof, \$1.39 billion; zinc and articles thereof, \$739 million; lead and articles thereof, \$132 million; and tin and articles thereof, \$121 million. In 2019, France's top five import partners for base metals and articles thereof were Germany (which provided 20% of France's base metals and articles thereof), Italy (14%), the United States (13%), China (12%), and Spain (6.6%) (United Nations Statistics Division, 2022).

In 2019, the value of France's exports and imports of precious and semiprecious stones was \$10.3 billion and \$9.57 billion, respectively. Major trade categories included jewelry, which accounted for 70.5% of precious and semiprecious stone exports and 64.2% of precious and semiprecious stone imports; gold (12.2% of exports and 11.3% of imports); and diamond (2.81% of exports and 9.42% of imports) (United Nations Statistics Division, 2022).

Commodity Review

Metals

Aluminum.—In 2019, aluminum production from Aluminum Dunkerque, which was owned by Liberty House Group of the United Kingdom, increased to 278,000 metric tons (t) from 227,000 t in 2018. This was due to the resolution of issues regarding an accident related to the smelter's storage tanks in 2018. The facility had a production capacity of 285,000 metric tons per year (t/yr). Approximately \$45 million (EUR40 million)¹ in investments was made in 2019, of which one-half was for the replacement of electrolysis tanks, and the other one-half was for the maintenance and improvement of production tools. Some other improvements in 2019 included modernization of the foundry during a 4-week period in August—specifically, improving the kinematics of the continuous vertical casting No. 2 (plate descent system), and the introduction of MAX, which was an autonomous and hybrid anode transporter with a carrying capacity of up to 12 t for increasing the efficiency of aluminum production operations. The MAX transporter was expected to be operational in the first quarter of 2020. Another \$45 million investment was planned for 2020 to modernize tools and improve working conditions, which together were expected to increase the plant's production capacity by 15,000 t/yr by the end of 2022. The company planned to invest a total of about \$110 million during the next 5 years. The facility employed 590 employees in 2019 (Alvarez, 2019; Liberty Aluminium Dunkerque, 2019a, b; Dufourg, 2020; Rio Tinto Ltd., 2020, p. 22).

The electrolysis plant owned by TRIMET Aluminium SE of Germany in Saint-Jean-de-Maurienne had 180 electrolytic cells in two production halls; 11 casting furnaces; 3 wire rod casting lines; 1 vertical DC-casting unit each for the T-bar and rolling slab mills (for a total of two casting units); 1 small-form ingot caster; and various cutting, processing, and packaging plants. The electrolysis plant had the capacity to produce 145,000 t/yr and 155,000 t/yr of primary aluminum and cast products, respectively, and the plant had 600 employees. TRIMET also owned a wire casting plant that had the capacity to produce 10,000 t/yr of cast products. It had 35 employees (TRIMET France, 2020a, b).

Cobalt and Nickel.—Eramet S.A.'s refinery in Havre-Sandouville nearly doubled its production of high-purity nickel (that is, nickel metal and salts) to 6,900 t in 2019 from 3,700 t in 2018. This increase was due to technical improvements implemented by an expert task force and strengthened site management (Eramet S.A., 2020b, p. 7–8, 13, 15).

Gold and Tungsten.—In June 2019, the Administrative Court of Toulouse ruled to cancel the exploration permit for the Couflens Mine (located 130 kilometers south of Toulouse in the Pyrenees region in southern France) issued to Apollo Minerals Ltd. of Australia because of purported errors made by the Government in granting the permit. The ruling required all work at the mine to be stopped immediately. The basis of this ruling

¹Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US\$) at the annual average exchange rate of EUR0.893=US\$1.00 for 2019.

was that Variscan Mines SAS, which was Apollo Minerals' French subsidiary, did not have the sufficient financial capacity to carry out research work and fulfill its obligations to protect the environment and the health of workers during exploration work pursuant to Article L. 122-2 of the Mining Code. Apollo Minerals and the Government lodged coordinated appeals with the Appeal Court of Bordeaux following the verdict. As of the end of December 2019, the plaintiffs had responded to the initial arguments, and the company had lodged its counter arguments. Further arguments or a court hearing were anticipated for early 2020 (Apollo Minerals Ltd., 2019a, p. 1, 5, 9; b, p. 2; 2020, p. 7).

The 42-square-kilometer project area of the Couflens tungsten-copper-gold mine included the historic Salau tungsten mine. Gold assay results from 1986 showed up to 1.9 meters (m) at a grade of 16 grams per metric ton (g/t) gold from channel sampling programs, and 8.5 m at a grade of 3.4 g/t gold, including 1.9 m at a grade of 8.4 g/t gold, from diamond drilling results within the mine area. The Salau Mine produced 930,000 t of ore at a grade of 1.5% tungsten from 1971 to 1986, when the mine was closed. Prior to the cancellation of its permit for the Salau Mine, Apollo Minerals had begun a geophysical program to define exploration targets and had identified numerous gold and tungsten targets from extensive in-mine mapping conducted as part of health and safety risk assessments at the mine; these targets included extensive zones with strong gold potential related to breccias cemented by massive sulfides with a thickness up to 5 m. Various safety and operational equipment was also installed, including in-mine ventilation, mine support repair, working areas for exploration, and communication and emergency facilities (Australian Mining, 2017; Apollo Minerals Ltd., 2019a, p. 1).

Iron and Steel.—ArcelorMittal S.A. of Luxembourg was the major iron and steel producer in France and had plants in Dunkerque and Gandrange. Approximately 70% of the 10 to 11 million metric tons (Mt) of raw steel produced in France was exported. The country's main markets were the automotive (45%), industrial (45%), and packaging (10%) sectors. In early May, ArcelorMittal announced a temporary reduction in steel production in Europe by 3 Mt on an annual basis, with another 1.5 Mt in other reductions by the end of the month. This resulted in a reduction of between 150,000 t and 200,000 t of raw steel production in the second half of 2019 for the Dunkerque plant. These actions were taken because of decreased demand as well as a sharp increase in imports, particularly from Turkey and Russia (table 2; France TV, 2019).

In December 2019, ArcelorMittal announced a plan to reduce carbon dioxide (CO₂) emissions by 30% by 2030 and to become carbon neutral by 2050. Major initiatives in support of this roadmap included clean power steelmaking, circular carbon steelmaking, and fossil fuel carbon capture and storage. Initiatives in France included the following: In Dunkerque, an industrial-scale pilot was installed to capture waste CO₂ from the steel-making process and convert it to synthetic gas, which would then be used to replace the use of fossil fuels in ironmaking; and the development of a carbon capture and storage pilot project, which would enable the capture of 0.5 metric tons per hour of CO₂ from steelmaking off-gases by 2021. In Fos-sur-Mer, an investment of \$146 million for

substantive work on its coke ovens was completed in 2019, bringing the ovens into compliance, and another \$112 million would be invested by 2023 to reduce the company's environmental impact by an additional 30% (ArcelorMittal S.A., 2020a, p. 4; 2020b, p. 44, 51).

Indium and Zinc.—Zinc concentrates were the principal source of primary indium. Indium and zinc production decreased by 13% (estimated) and 3.2% in 2019, respectively, compared with that of 2018. The decrease was because Nyrstar NV had limited funds to purchase the necessary raw materials for production. A four-day unplanned closure for maintenance in March at the Aubry zinc smelter also contributed to the decreased production (Argus Media, 2019).

Mineral Fuels and Other Sources of Energy

Nuclear Energy.—As of December 2019, construction was completed for the Tokamak ("toroidal chamber with magnetic coils") building of the International Thermonuclear Experimental Reactor (ITER) in Cadarache, Provence-Alpes-Côte d'Azur region. Fabrication of reactor components was complete or nearing completion, and the assembly phase was scheduled to begin in March 2020, when the number of workers at ITER was to be increased to 3,000 from about 900 in 2019. By yearend, the ITER Council announced the completion of 67% of the project's execution to First Plasma (which includes all design work; construction and manufacturing; delivery; assembly; and installation and commissioning). Tests of First Plasma were expected in 2025, and full fusion power, by 2035. The amount of fusion power to be generated from the facility was estimated to be 500 megawatts (International Thermonuclear Experimental Reactor, 2019a-c; 2020, p. 3, 27, 65; 2021).

Orano S.A., which was France's state-owned company for uranium and nuclear fuel, was engaged in uranium mining, chemistry, and enrichment; recycling of used fuel, and decommissioning of nuclear powerplants. In 2019, Orano mined 5,809 t of uranium in Canada, Kazakhstan, and Niger, accounting for 11% of the global total. The company domestically operated the Malvesi plant in Aude and the Philippe Coste plant in Tricastin, which were both conversion plants; and the Georges Besse II enrichment plant in Tricastin. Mineral reserves in Orano's deposits were 196,362 t as of yearend compared with 187,060 t in 2018 (Orano S.A., 2020, p. 9, 18, 20; World Nuclear Association, 2020).

Outlook

In 2020, the GDP of France is expected to decrease by 10.5% owing to global disruptions caused by the coronavirus disease 2019 (COVID-19) pandemic, followed by an increase of 7.5% in 2021. France principally processes minerals for export and, to a smaller degree, for its manufacturing industry. Temporary measures were enacted for iron and steel production in response to decreased demand in 2019, and these effects are likely to be prolonged and exacerbated for 2020 and beyond as a result of decreased demand owing to the global COVID-19 pandemic. Ongoing legal complications are likely to preclude all domestic gold and tungsten production from the Couflens Mine for the

foreseeable future. The country will continue to pursue nuclear energy options, and the plans for the ITER project are that it achieve a net energy surplus by the early 2030s and commercial fusion electricity production by 2050 (European Fusion Development Agreement, 2012, p. 11; European Commission, 2020, p. 23).

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TABLE 1
 FRANCE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2015	2016	2017	2018	2019
METALS					
Aluminum, metal: ^e					
Primary thousand metric tons	420	425	429	380	430
Secondary do.	180	180	190	190	190
Total do.	600	605	619	570	620
Cobalt, refinery, chloride, Co content	133	119	277	48	200
Ferrous alloys:					
Ferromanganese thousand metric tons	126	119	95	125	115
Ferrosilicon ^e do.	40	50	50	50	48
Silicomanganese do.	65	58	58	57	68
Indium, refinery, primary, In content kilograms	41,000	--	29,800	46,200 ^r	40,000 ^e
Iron and steel:					
Pig iron thousand metric tons	10,097	9,724	10,678	10,530	9,878
Steel:					
Raw steel do.	14,984	14,413	15,505 ^r	15,387 ^r	14,451
Products, hot rolled do.	14,994	14,319	15,103	15,100 ^e	14,000 ^e
Lead, refinery, secondary do.	72 ^e	70	70	70	70
Nickel, refinery, metal	6,533	4,639	2,329	3,667	6,947
Silicon, metal ^e thousand metric tons	123 ^r	151 ^r	149 ^r	138 ^r	100
Zinc, smelter, primary do.	169	149	166	155	160 ^e
INDUSTRIAL MINERALS					
Bentonite	36,404	36,000 ^e	24,497	35,696	36,000 ^e
Cement, hydraulic thousand metric tons	15,600	15,900	16,900	16,500 ^r	16,700 ^e
Clay, kaolin, marketable	275,150	274,472	279,120	301,842	302,000 ^e
Gypsum, mine, including anhydrite thousand metric tons	1,808 ^r	4,183	3,014	2,836 ^r	2,054
Iron oxide pigments do.	8	8	8	8	8 ^e
Lime, quick and hydrated do.	2,504	2,500 ^e	2,600 ^e	2,600 ^e	2,600 ^e
Mica ^e	20,700	19,600	19,200	20,000	20,000
Nitrogen, ammonia, N content thousand metric tons	1,040	1,010	750	914 ^r	884
Pumice and related minerals, pozzolan, including lapilli do.	276	280 ^e	280 ^e	280 ^e	280 ^e
Salt, all sources do.	6,062	5,463	5,003	5,653	5,439
Sand and gravel, industrial, silica do.	8,819 ^r	9,584 ^r	9,712 ^r	10,193 ^r	10,829
Stone, sand, and gravel, construction:					
Sand and gravel, unspecified	220,619	223,637 ^r	228,007 ^r	238,471 ^r	243,946
Stone:					
Crushed:					
Chalk	2,615,655 ^r	2,609,157 ^r	3,013,686 ^r	3,010,066 ^r	3,010,000 ^e
Limestone, agricultural and industrial	8,714,639 ^r	6,844,372 ^r	7,405,079 ^r	7,932,540 ^r	9,311,307
Dimension:	17,358 ^r	16,840 ^r	18,000 ^{r,e}	20,462 ^r	23,000
Dolomite	419,985	248,847	547,326	637,114 ^r	545,815
Granite	207,646 ^r	240,986 ^r	223,218 ^r	278,819 ^r	320,509
Marble, including travertine	17,358 ^r	16,840 ^r	18,000 ^{r,e}	20,462 ^r	23,000

See footnotes at end of table.

TABLE 1—Continued
FRANCE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2015	2016	2017	2018	2019
MINERAL FUELS AND RELATED MATERIALS					
Carbon black thousand metric tons	135 ^r	144 ^r	NA	NA	140 ^e
Natural gas, marketable million cubic meters	28	28 ^{r, e}	28 ^{r, e}	28 ^{r, e}	28 ^e
Petroleum:					
Crude thousand 42-gallon barrels	6,205	5,840	5,475	5,840	5,840 ^e
Refinery:					
Throughput do.	420,480	409,530	419,385	396,025	356,970
Products:					
Distillate fuel oil do.	196,300	196,000 ^e	196,000 ^e	196,000 ^e	196,000 ^e
Gasoline do.	98,600	98,600 ^e	98,000 ^e	98,000 ^e	98,000 ^e
Kerosene, including jet fuel do.	30,100	30,100 ^e	30,000 ^e	30,000 ^e	30,000 ^e
Liquefied petroleum gas do.	16,800	16,800 ^e	17,000 ^e	17,000 ^e	17,000 ^e
Residual fuel oil do.	37,700	37,700 ^e	38,000 ^e	38,000 ^e	38,000 ^e
Other do.	82,400	82,400 ^e	83,000 ^e	83,000 ^e	83,000 ^e
Total do.	462,000	462,000 ^e	462,000 ^e	462,000 ^e	462,000 ^e

^eEstimated. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through October 13, 2020. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the commodities listed, alumina, antimony, barite, diatomite, metallurgical coke, feldspar, germanium, kyanite, sandstone, slate, soda ash (synthetic), sodium compounds, sulfur (byproduct of natural gas and petroleum), and talc may have been produced, but available information was inadequate to make reliable estimates of output.

TABLE 2
FRANCE: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Alumina, metallurgical	Alteo Holdings, 100%	Plant at Gardanne	700
Aluminum:			
Metal	Liberty House Group	Smelter at Dunkerque	285
Do.	TRIMET Aluminium SE	Smelter at Saint-Jean-de-Maurienne, Savoie	145
Product	do.	Wire casting plant at Castelsarrasin, Tarn-et-Garonne	10
Andalusite	Denain-Anzin Minéraux Réfractaire Céramique S.A.	Glomel Mine at Brittany	75
Antimony, metal	Produits Chimiques de Lucette S.A.S.	Plant at Le Genest, Mayene Department	15
Barite	Barytine de Chaillac	Mine and plant at Chaillac	150
Do.	Société Industrielle du Centre	Mine at Rossigno, Indre Department	100
Cement	LafargeHolcim Ltd.	18 plants, the largest at St. Pierre-la-Cour (1,500)	9,700
Do.	Ciments Calcia (Italcementi S.p.A)	9 plants, the largest at Gargenville (1,100)	7,500
Do.	Vicat Group	Montalieu, in the north of the Rhone-Alpes region; Crechy (Allier Department), near Vichy; La Grave de Peille (Alpes-Maritimes Department), inland from Nice; Saint-Egreve (Isere Department), Grenoble area; Xeuilley (Meurthe-et- Moselle Department), near Nancy	3,000
Clay, kaolin	Groupe Mineral Harwanne (GMH)	Kaolin d'Arvor Mine at Quessoy	310
Cobalt, metal	metric tons Eramet S.A.	Plant at Sandouville, near Le Havre	400
Diatomite	Ceca S.A.	Mines and plants at Riom-les-Montagne and St. Bauzille	100
Feldspar	Denain-Anzin Mineraux S.A. (Imerys S.A.)	Mine and plant at St. Chely d'Apcher	55
Ferroalloys	Comilog Dunkerque (Eramet S.A., 100%)	Plant at Gravelines	70
Do.	FerroPem S.A. (Grupo Ferroglobe Plc., 100%)	Anglefort (Ain Department); Chateau-Feuillet and Montricher (Savoie Department); Dunkirk (Nord Department); Laundun (Gard Department); Les Clavaux (Isere Department); Pierrefitte (Hautes Department)	290
Do.	Glencore Manganese France S.A. (Glencore plc, 100%)	Plant at Dunkerque	140
Gypsum, mine, including anhydrite	Placoplatre S.A. (Compagnie de Saint-Gobain S.A.)	Quarries at: Bernouille	500
Do.	do.	Cormeilles-en-Parisis	350
Do.	do.	Lazer	150
Do.	do.	Le Pin-Villeparisis-Villevaude	580
Do.	do.	Montmorency massif	620
Do.	do.	Pouillon	15
Do.	do.	Saint-Jean-de-Maurienne	265
Indium	metric tons Nyrstar NV	Smelter at Aubry	70
Iron and steel, steel:			
Raw	ArcelorMittal S.A.	Plants at Dunkerque, Florange, and Fos-sur-Mer	11,000
Rolling mills	do.	Plant at Gandrange	8,400
Do.	Erasteel S.A. (Eramet S.A., 100%)	Commentry	NA
Do.	do.	Champagnole	NA
Mica	Denain-Anzin Minéraux S.A. (Imerys S.A.)	Mine at Ploemeur, Brittany	160
Natural gas	million cubic meters Total S.A.	Gasfield and plant at Lacq	33
Nickel, metal	Eramet S.A.	Plant at Sandouville, near Le Havre	16
Nitrogen, N content of ammonia	GPN S.A.	Plant at Grandpuits	NA

See footnotes at end of table.

TABLE 2—Continued
FRANCE: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity ^e
Petroleum:				
Crude	thousand 42-gallon barrels	Total S.A.	Paris Basin oilfields	6,000
Refined	do.	Cie. Rhenane de Raffinage (CRR)	Refinery at Reichstett	28,000
Do.	do.	Esso S.A. (Exxon Mobil Corp.)	Refineries at Fos-sur-Mer	21,700
Do.	do.	do.	Refinery at Port Jerome	98,600
Do.	do.	Ineos Group Ltd.	Refineries at Lavera	61,300
Do.	do.	Petroplus S.A.	Refinery at Petite Couronne	99,800
Do.	do.	Total S.A.	Refinery at Gonfreville	156,000
Do.	do.	do.	Refinery at Donges	70,000
Do.	do.	do.	Refinery at Feyzin	42,000
Do.	do.	do.	Refinery at Grandpuits	33,600
Salt		Compagnie des Salins du Midi et des Salines de l'Est (Salins Group)	Mines and plants at Aigues-Mortes, Dax, Salin-de-Giraud, and Varangeville	2,500
Sulfur:				
Byproduct, natural gas and petroleum		Esso S.A. (Exxon Mobil Corp.)	Refinery at Fos-sur-Mer	39
Do.		do.	Refinery at Port Jerome, Notre-Dame-de-Gravenchon	82
Do.		Total S.A.	Refinery at Donges	73
Do.		do.	Refinery at Feyzin	37
Do.		do.	Refinery at Gonfreville	143
Do.		do.	Refinery at Grandpuits	50
Hydrogen sulfide		do.	Natural gas processing plant at Lacq	1,830
Sulfuric acid		Nyrstar NV	Zinc smelter at Auby	185
Talc		Talc de Luzenac S.A. (Imerys S.A., 100%)	Trimouns Mine near Ariege, Pyrenees	450
Zinc, metal		Nyrstar NV	Zinc smelter at Auby	172

^eEstimated. Do., do. Ditto. NA Not available.