



2011 Minerals Yearbook

FRANCE

THE MINERAL INDUSTRY OF FRANCE

By Alberto Alexander Perez

France's gross domestic product (GDP) was \$2.734 trillion in 2011, which was 1.7% higher than the GDP in 2010. France continued to have the third largest GDP in the European Union (EU) after Germany and the United Kingdom. The output value of France's entire industrial sector accounted for about 18.7% of the GDP in 2011. The country was a significant processor of raw mineral materials and a manufacturer of industrial and consumer durable goods. France's heavy industries, which, among other product categories, produced automotive and aviation products, chemicals, and machine tools for domestic consumption and export, relied mainly on imported metal ores and concentrates and on imported industrial minerals and mineral fuels (U.S. Central Intelligence Agency, 2012).

Minerals in the National Economy

During at least the past 20 years, France gradually transitioned from being a mineral producer and processor of mineral commodities to being mainly a processor. Most mining, and certainly mining of metals, had ceased in metropolitan France. Owing to the size and structure of France's economy, the upstream input of minerals was key to the continued maintenance and growth of the country's heavy industries.

Government Policies and Programs

The French mining code was last modified on March 1, 2011. Most of the changes were aimed at simplifying the acquisition of exploration licenses and licenses for the development of future projects (Legifrance.gouv.fr, 2013).

The Ministry of Ecology and Sustainable Development was responsible for overseeing and regulating such environmental issues as agricultural runoff; air pollution from industrial and vehicle emissions; forest damage from acid rain; and water pollution from mining, mineral processing, and urban waste. The Government had created the Agency for Industrial Innovation [Agence de l'Innovation Industrielle] (AII) in June 2005. In 2008, the AII was integrated into a new association called OSEO, which was created to fund and help businesses—particularly small- and medium-sized businesses—develop and finance innovation (OSEO, 2010).

Production

In 2011, the mineral industry of France produced at about the same level of output as in 2010. Ferroalloys production increased by about 10%; alumina increased by about 8.9%; hydraulic cement, 8%; secondary aluminum 3.8%; and crude steel, 2.4%. The mineral commodities for which output decreased notably were primary aluminum (by 6.2%) and pig iron (by 4.3%). Other significant increases or decreases shown in table 1 and not mentioned here might be subject to future changes as estimated production data are revised (table 1).

Mineral Trade

Most of France's demand for fuel and nonfuel mineral raw materials was met by imports. The major commercial partners of France were all members of the EU and included Belgium, Germany, Italy, and Spain. The United States was the leading non-EU commercial partner of France. In 2010 (the latest year for which data was available), exports from France to other countries in the EU¹ included manufactured metals, which were valued at \$7.53 billion; nonferrous metals, \$4.99 billion; and metalliferous ores and metal scrap, \$4.6 billion. Imports by France of goods originating from other countries in the EU included manufactured metals valued at \$13.60 billion, nonferrous metals valued at \$6.62 billion, and metalliferous ores and metal scrap valued at \$2.27 billion. In contrast, France's leading mineral industry imports from a non-EU country (in terms of value and not including mineral fuels) were manufactured metals valued at \$2.7 billion and nonferrous metals valued at \$2.53 billion (Eurostat, 2011a, p. 110–112, 118–120, 136–138, 134–138; 2011b).

In terms of energy imports, France's imports of oil equivalent in 2010 (the latest year for which data were available), were valued at 133,604,000 metric tons (t). France's main energy suppliers were the countries of the Commonwealth of Independent States, Norway, and several African countries. Only a small percentage of energy imports originated from Middle East countries (Eurostat, 2013).

Structure of the Mineral Industry

Although France continued to maintain state monopolies in a number of sectors of the economy, principally in the energy production and transport sectors, state ownership in the mineral sector was minimal. In 2011, the French Government maintained partial ownership of the country's electricity generation and natural gas production and distribution facilities, as well as ownership of rail and public transportation systems in most French cities. Table 2 provides data on the major enterprises that produced metals, industrial minerals, and mineral fuels in France in 2011.

Commodity Review

Metals

Aluminum.—In 2011, France's output of primary aluminum decreased by 6.2%, and that of secondary aluminum increased by 3.8% (table 1). Rio Tinto Ltd. of Australia was the country's sole producer of primary aluminum. Rio Tinto also operated facilities for the production of alumina and aluminum

¹In the European Commission's official reports, exports from one member country to other countries within the European Union (EU) are referred to as "dispatches," and imports by a member country from other countries in the EU are referred to as "arrivals."

semimanufactures. Rio Tinto produced specialty alumina at the Gardanne specialty alumina plant (Rio Tinto Alcan, 2012).

Bismuth.—In January, Orrion Chemicals stated that its operations at Orrion Chemicals Specialmin (previously Pharmacie Central de France) had developed a full European distribution organization for its specialty chemicals (Orrion Chemicals Specialmin S.A., 2011).

Ferroalloys.—The Brazilian company Vale S.A. reported that it had an unscheduled preventive maintenance stoppage at its plant in Dunkerque in the 4th quarter of 2011 that affected final 2011 production. The plant had the capacity to produce 140,000 t/yr of ferromanganese (Vale S.A., 2012, p. 4).

Iron and Steel.—France's output of pig iron decreased by 4.3%. Crude steel production increased by 2.4% (table 1). Crude steel apparent use increased by 5.3% (World Steel Association, 2012, p. 75).

Industrial Minerals

France produced a broad variety of industrial minerals. In 2011, Imerys Group, which was a major French producer of industrial minerals, mined and processed ball clays, carbonates, feldspar, and red clays domestically and from deposits in such countries as China, Germany, Spain, the United States, and Vietnam for domestic use and export (Imerys S.A., 2012, p. 6–7).

Cement.—In 2011, cement consumption in France increased slightly, and production increased by 7.8% compared with that of 2010 owing to a 5% increase in the residential construction sector. Civil engineering works also increased by 5% whereas nonresidential construction decreased by an estimated 1%.

France's principal cement manufacturers were Lafarge S.A. and Société des Ciments Français, which was a subsidiary of Italcementi S.p.A of Italy. In addition to their cement-producing facilities in France, both companies had major capital assets abroad. The other significant producers of cement in France were the Vicat Group, which had five plants with a total cement production capacity of 6 Mt/yr, and Ciments d'Origny, which had six plants and a total cement production capacity of 4.2 Mt/yr (table 2; Cembureau, 2012, p. 8).

Mineral Fuels and Other Sources of Energy

In 2010 (the latest year for which data were available), nuclear energy accounted for an estimated 75.2% of primary electricity production. The principal sectors that consumed energy in France were, in order of consumption, the residential sector, the transportation sector, the manufacturing industry [as defined by the Institut National de la Statistique et des Études Économiques (INSEE)], the steel industry, and the agricultural sector (Institut National de la Statistique et des Études Économiques, 2012b).

Renewable energy production decreased by 12.5%, although production of solar energy increased by 226% and production of wind power energy increased by 22.6% (Institut National de la Statistique et des Études Économiques, 2012a).

Natural Gas and Petroleum.—In 2011, France's domestic production of crude petroleum remained stable compared with the output in 2010. The production of natural gas decreased by

an estimated 9%, which continued the trend of a substantial production decline since 2005. Domestic production of petroleum products declined by about 8.3% in 2010 (the latest year for which production data were available) compared with that of 2009 (U.S. Energy Information Administration, 2012).

Nuclear Energy.—In 2009 (the latest year for which data were available), France had 59 active nuclear powerplants, which produced more than 75% of the primary electricity in France. Group Areva, which was the French Government-owned nuclear technology company, was building the first nuclear reactors in Western Europe in 20 years. Areva's reactor, which is called a Third Generation, or EPR (Evolutionary Power Reactor, or European Pressurized Reactor, as it is known in Europe), had helped the company compete for new construction contracts for nuclear powerplants in France and abroad.

In December 2011, at the International Thermonuclear Experimental Reactor (ITER) complex in Cadarache, Provence-Alpes-Côte d'Azur region, the last segment of the seismic mat was poured, and the Tokamak pit construction was reportedly progressing according to schedule. The seven participants in the ITER project were China, the EU, India, Japan, the Republic of Korea, Russia, and the United States. The project was based on the toroidal magnetic field (Tokamak) reactor, and was focused on developing nuclear power production from fusion-generated energy rather than nuclear fission-generated energy (International Thermonuclear Experimental Reactor, 2011).

Outlook

France is likely to continue to produce consumer and producer durables and such intermediate mineral products as ferrous and nonferrous metals and semimanufactures, construction materials, and chemicals, although much of its ores and mineral intermediate manufactured goods will continue to be imported. The share of renewable energy in France's total consumption of energy is expected to grow as the Government is investing and promoting renewable energy usage. Nuclear energy appears to be the focus of the Government's energy generation strategy for the near future.

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TABLE 1
FRANCE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2007	2008	2009	2010	2011
METALS					
Aluminum:					
Bauxite, gross weight ^{c,3} thousand metric tons	160	160	160	--	--
Alumina, metallurgical, gross weight ^e do.	500	592	348	481	524
Metal:					
Primary do.	428	389	345	356	334
Secondary do.	225	209	138	184	191
Antimony, metal, including regulus ^e	500	500	500	500	500
Cadmium metal ^e	50	50	50	50	--
Cobalt, metal:	305	311	368	302	354
Gold, mine output, Au content ^e kilograms	1,500	1,500	1,500	1,500	--
Iron and steel:					
Metal:					
Pig iron thousand metric tons	12,425	11,372	8,104	10,137	9,698
Ferroalloys, electric furnace: ^e					
Ferromanganese do.	144	47	46	138	131
Ferrosilicon do.	100	100	20	27	59
Silicomanganese do.	65	60	54	62	63
Silicon metal ^e do.	120 ^r	118 ^r	80 ^r	112	128
Other do.	60	60	60	60	60
Total do.	489 ^r	385 ^r	260	400	440
Steel:					
Crude do.	19,252	17,900	12,840	15,414	15,780
Hot-rolled do.	16,903	14,746	11,382	13,581	13,715
Lead, refined: ^e					
Primary	--	--	--	--	11,346 ⁴
Secondary	88,000	82,000	82,000	82,000	53,887 ⁴
Total	88,000	82,000	82,000 ^r	82,000	65,233 ⁴
Nickel, refinery products, Ni content ⁵	13,200 ^r	13,200 ^r	14,000 ^r	12,900 ^r	12,800
Silver: ^e					
Mine output, Ag content kilograms	700	--	--	--	--
Metal, Ag content of final smelter products do.	400	--	--	--	--
Tin, secondary ^e	1,500	1,500	1,500	1,500	--
Zinc metal, including slab and secondary	129,000	118,900	161,000 ^r	163,000 ^r	164,000
INDUSTRIAL MINERALS					
Abrasives, undifferentiated ^e	272	270	270	270	270
Barite, BaSO ₃ equivalent ^e	--	--	--	--	--
Cement, hydraulic thousand metric tons	22,300 ^e	21,400	18,300	17,998	19,433
Clays:					
Kaolin and kaolinitic clay (marketable) do.	307	624 ^r	519	315	315
Refractory clay, unspecified ^e do.	15	15	15	15	15
Diamond, synthetic, industrial ^e thousand carats	3,600	3,600	3,600	3,600	3,600
Diatomite ^e thousand metric tons	75	75	75	75	75
Feldspar, crude ^e do.	650	650	650	650	650
Fluorspar, marketable do.	--	--	--	--	--
Gypsum and anhydrite, crude ^e do.	3,500	3,500	3,351 ⁴	3,440 ⁴	4,231 ⁴
Kyanite, andalusite, related materials ^e do.	65	65	65	65	65
Lime, quick and hydrated, dead-burned dolomite ^e do.	4,000	4,000	4,000	4,000	4,000
Mica ^e	20,000	20,000	20,000	20,000	20,000
Nitrogen, N content of ammonia ^e thousand metric tons	800	800	2,970 ⁴	3,517 ⁴	3,500 ^e
Pigments, mineral, natural, iron oxide ^e	1,000	1,000	1,000	1,000	1,000
Phosphates, Thomas slag ^e thousand metric tons	50	50	50	50	50
Pumice and other natural abrasives ^e do.	276	270	270	270	270

See footnotes at end of table.

TABLE 1—Continued
FRANCE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2007	2008	2009	2010	2011
INDUSTRIAL MINERALS—Continued					
Salt, all sources ^e	6,140	6,240	6,200	5,867	5,430
thousand metric tons					
Sodium compounds: ^e					
Soda ash	1,000	1,000	1,000	1,000	1,000
do.					
Sodium sulfate	120	120	120	120	120
do.					
Stone, sand and gravel:					
Chalk	583	580 ^e	1,294	1,765	2,733
do.					
Dolomite, crude	984	980 ^e	777	700	3,932
do.					
Granite, crude	373	370 ^e	403	426	482
do.					
Limestone, agricultural and industrial	11,699	11,700 ^e	8,302	9,102	10,666
do.					
Marble and travertine, crude	148	150 ^e	150 ^e	150 ^e	150 ^e
do.					
Sand and gravel: ^e					
Industrial sands	5,200	5,200	7,442 ⁴	8,498 ⁴	6,286 ⁴
do.					
Other sand, gravel, and aggregates	165,000	165,000	263,530 ⁴	249,512 ⁴	277,521 ⁴
do.					
Sandstone	95	95 ^e	109	100	100 ^e
do.					
Slate, crude	8,716	8,700 ^e	8,700 ^e	8,700 ^e	8,700
do.					
Sulfur, all sources ^e	650	650	650	650	650
do.					
Talc, crude ^e	420	420	420	420	420
do.					
MINERAL FUELS AND RELATED MATERIALS					
Asphaltic material ^e	20,000	20,000	11,675 ⁴	11,600	11,600
do.					
Carbon black ^e	200,000	200,000	178,777 ⁴	203,563 ⁴	134,329 ⁴
do.					
Coal, briquets ^e	100	100	100	100	100
do.					
Coke, metallurgical ^e	4,500	4,500	4,500	4,500	4,500
do.					
Gas, natural, marketed	1,642	1,472	1,444	1,245	1,132
do.					
Petroleum:					
Crude	7,242	7,117	6,624	6,606	6,508
do.					
Refinery products:					
Liquefied petroleum gas	30,358	33,860	29,236	24,346 ^r	24,300
do.					
Gasoline, all kinds	142,069	141,195	133,225	115,596 ^r	115,000
do.					
Kerosene and jet fuel	44,293	44,462	39,274	35,113 ^r	35,100
do.					
Distillate fuel oil	259,550	275,148	246,959	224,950 ^r	224,900
do.					
Residual fuel oil	73,803	73,342	61,137	59,313 ^r	59,300
do.					
Other products	115,335	124,347	107,748	106,617 ^r	106,600
do.					
Total	665,408	692,354	617,579	565,900 ^r	565,200

^eEstimated; estimated data rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through January 31, 2012.

²In addition to the commodities listed, France produces germanium from domestic ores, but actual output is not regularly reported.

³Reprocessed bauxite not for metallurgical use.

⁴Reported figure

⁵Excludes secondary production from nickel-cadmium batteries.

TABLE 2
FRANCE: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, metallurgical		Rio Tinto Ltd.	Plant at Gardanne	700
Aluminum		do.	Aluminum smelters at:	
Do.		do.	Saint-Jean-de-Maurienne, Savoie	120
Do.		do.	Pyrenees, Atlantiques Province	115
Do.		do.	Lannemezan, Hautes-Pyrenees	63
Do.		do.	Dunkerque, Calais du Nord	250
Andalusite		Denain-Anzin Minéraux Réfractaire Céramique	Glomel Mine, Brittany	75
Antimony, metal		Produits Chimiques de Lucette	Plant at Le Genest, Mayeene Province	15
Barite		Barytine de Chaillac	Mine and plant at Chaillac	150
Do.		Société Industrielle du Centre	Mine at Rossigno, Indre Province	100
Cadmium	metric tons	Compagnie Royale Asturienne des Mines	Plant at D'Auby-les-Douai	200
Cement		Four companies, of which the largest are:	80 plants, including:	26,700
Do.		Lafarge S.A.	13 plants; largest is at St. Pierre-la-Cour (1,160)	9,500
Do.		Société des Ciment Français	9 plants; largest is at Gargenville (1,100)	7,500
Clay, kaolin		Groupe Mineral Harwanne (GMH)	Kaolin d'Arvor Mine, Quessoy	300
Cobalt, metal	metric tons	Société Métallurgique le Nickel (SLN)	Plant at Sandouville, near Le Havre	600
Copper, metal		Compagnie Générale d'Électrolyse du Palais	Electrolytic plant at Palais-sur-Vienne	45
Do.		Société Française d'Affinage du Cuivre	Smelter at carrieres-sous-Poissy	11
Diatomite		Ceca S.A.	Mines and plants at Riom-les-Montagne and St. Bazille	100
Feldspar		Denain-Anzin Mineraux S.A. (Imerys Group)	Mine and plant at St. Chely d'Apcher	55
Ferroalloys		Comilog Dunkerque (ERAMET SA, 100%)	Dunkerque	70
Do.			Plants at Anglefort, Laudun-L'ardoise, Petit-Coeur, Gavet and Saint-Julien-montdenis	148
Do.		Vale S.A. Dunkerque (Vale Group 100%)	Plant at Dunkerque	140
Gypsum		S.A. de Matériel de Construction	Mine at Taverny	1,500
Iron and steel, steel		ArcelorMittal Group	Dunkerque	6,700
Do.		do.	Fos-sur-Mer	4,200
Do.		do.	Florange	3,200
Do.		Usinor Group	Gadrange, Neuves Maisons	8,400
Mica		Denain-Anzin Minéraux S.A. (Imerys Group)	Mine at Ploemeur, Brittany	160
Natural gas	million cubic meters	Société Nationale Elf Aquitaine (SNEA)	Gasfield and plant at Lacq	20,000
Nickel, metal		Société Métallurgie le Nickel (SLN)	Plant at Sandouville	16
Nitrogen, N content of ammonia		Grande Paroisse S.A.	Plant at Grandpuits	390
Petroleum:				
Crude	42-gallon barrels per day	Société National Elf Aquitaine (SNEA)	Paris Basin oilfields	1,000
Refined	do.	Total S.A.	Refineries at Gonfreville and La Mede	446,000
Do.		Shell-Française	Refinery at Petite Couron	285,000
Do.		do.	Refinery at Berre	270,000
Do.		Société Nationale Elf Aquitaine (SNEA)	Refinery at Feyzin	120,000
Do.		do.	Refinery at Donges	200,000
Do.		do.	Refinery at Grandpuits	96,000
Do.		Ineos Group Ltd.	Refineries at Lavera	175,000
Do.		Esso S.A.	Refineries at Fos-sur-Mer	237,000
Do.		do.	Refineries at Gravenchon	62,000
Do.		Cie. Rhenane de Raffinage (CRR)	Refinery at Reichstett	80,000

See footnotes at end of table.

TABLE 2—Continued
 FRANCE: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Salt		Compagnie des Salins du Midi et des Salines de l'Est (Salins Group)	Mines and plants at Algues Mortes, Dax, Salin de Girad, and Varangeville	2,500
Sulfur		Société Nationale Elf Aquitaine (SNEA)	Byproduct from natural gas, Lacq plant	3,000
Talc		Talc de Luzenac S.A. (Rio Tinto Inc., 100%)	Trimouns Mine near Ariege, Pyrenees	350
Uranium, U ₃ O ₈	metric tons	Compagnie Général des Matières Nucléaires (Areva S.A., 100%)	Mines at Limousin and Vendee	1,800
Zinc, metal		Umicore Group	Plants at Auby-les-Douai and Calais	220
Do., do. Ditto.				