



2012 Minerals Yearbook

FRANCE

THE MINERAL INDUSTRY OF FRANCE

By Alberto Alexander Perez

France's gross domestic product (GDP) was \$2.579 trillion in 2012, which was about the same as the revised value for its GDP in 2011. France had 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 18.8% of the GDP in 2012. 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, 2014).

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 is 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 Bureau de Recherches Géologiques et Minières [Bureau of Mining and Geological Research] (BRGM), which was France's geological survey, is the French institution that performs and develops geologic and mineral research in France and abroad. Its headquarters are located in Orleans.

Production

In 2012, the mineral industry of France produced at about the same level of output as in 2011. Production of alumina decreased by about 8.5%, and that of hydraulic cement, by an estimated 7.4%. Primary aluminum production increased by 4.5%, and pig iron and crude steel production, by 1.7% and 1%, respectively (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 were available), exports from France to other countries in the EU¹ included iron and steel valued at \$12 billion; petroleum and petroleum products, \$8 billion; manufactured metals, \$7.09 billion;² nonferrous metals, \$4.695 billion; and metalliferous ores and metal scrap, \$4.335 billion. Imports by France of goods originating from other countries in the EU included iron and steel valued at \$15 billion; manufactured metals, \$12.801 billion; natural gas, \$12.6 billion; petroleum and petroleum products, \$11.7 billion; nonferrous metals, \$8.382 billion, and metalliferous ores and metal scrap, \$2.136 billion. In contrast, France's leading mineral industry imports from a non-EU country in terms of value were petroleum and petroleum products valued at \$48 billion; natural gas, \$5.6 billion; nonferrous metals, \$3.438 billion; and manufactured metals, \$2.388 billion (Eurostat, 2011a; 2011b, p. 110–112, 118–120, 126–128, 134–138).

In terms of energy imports, France's imports of oil equivalent in 2010 (the latest year for which data were available) totaled 133.6 million metric tons. 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 2012, 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 2012.

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."

²Where necessary, values have been converted from euro area euros (€) to U.S. dollars (US\$) at an average exchange rate of €0.755=US\$1.00.

Commodity Review

Metals

Aluminum.—In 2012, France's output of primary aluminum increased by 4.5% (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 aluminum semimanufactures. Rio Tinto sold its Gardanne specialty alumina plant to H.I.G. Capital Europe, which in turn formed a new company called Alteo Holdings to manage the plant (Rio Tinto Alcan, 2012).

Ferroalloys.—The Brazilian company Vale S.A. reported that it had sold its manganese ferroalloys operations in Europe for \$160 million to subsidiaries of Glencore International Plc. of the United Kingdom. The facilities included in the sale were Vale Manganese France SAS (located in Dunkerque, France) and Vale Manganese Norway AS (located in Mo I Rana, Norway) (Vale S.A., 2012, p. 4).

Iron and Steel.—France's output of pig iron decreased by 1.7%. Crude steel production decreased by 1% (table 1). Crude steel apparent use decreased by 13.3% (World Steel Association, 2013, p. 77).

Industrial Minerals

France produced a broad variety of industrial minerals. In 2012, the 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 2012, cement production decreased by an estimated 7.4% and cement consumption, by 6.7% compared with the levels of production and consumption, respectively, in 2011. The decreases were owing to a 17% decrease in the residential construction sector.

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 million metric tons per year (Mt/yr), and Holcim Ciments S.A., which had six plants and a total cement production capacity of 4.2 Mt/yr (table 2; Cembureau, 2013, p. 10).

Mineral Fuels and Other Sources of Energy

In 2012, nuclear energy accounted for an estimated 94% of primary electricity production. The principal sectors that consumed energy in France were, in order of consumption, the residential sector (44.5%), the transportation sector (31.9%), and the manufacturing and steelmaking industries and agricultural sectors combined (23.7%) (Institut National de la Statistique et des Études Économiques, 2014a).

Renewable energy production increased by 18.9% in 2012. Within the renewable energy sector, production of photovoltaic

cell solar energy increased by 88.2% and production of wind power energy increased by 22.04% (Institut National de la Statistique et des Études Économiques, 2014b).

Natural Gas and Petroleum.—In 2012, France's domestic production of crude petroleum decreased by 8.6% compared with the output in 2011. Domestic production of petroleum products decreased by about 1.1% in 2012 compared with production in 2011 (U.S. Energy Information Administration, 2014).

Nuclear Energy.—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 in the Provence-Alpes-Côte d'Azur region, the last segment of the seismic isolation pit basemat was poured, and construction of the support structure for the the Tokamak complex was reportedly progressing according to schedule; the reactor was expected to be commissioned by 2019. The seven participants in the ITER project were the United States, China, the EU, India, Japan, the Republic of Korea, and Russia. The project seeks to demonstrate the feasibility of producing nuclear power using nuclear-fusion-generated energy rather than nuclear-fission-generated energy (International Thermonuclear Experimental Reactor, 2011).

Outlook

The French economy has been slow to recover from its recession, and this has affected its industry and employment. Because France is principally a processor of minerals, the domestic rate of consumption of national goods and services and the demand for its manufactured goods abroad directly affect the French mineral industry and its expectations for growth. France will likely continue to import much of its ores and minerals for its manufactured goods industry, although the French Government has indicated that is interested in restarting the mining of mineral commodities in metropolitan France. The share of renewable energy in France's total consumption of energy continues to grow as the Government is investing and promoting renewable energy usage. Despite this increase, and although there is public interest in decreasing the role of nuclear energy in the country, nuclear power will very likely remain 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	2008	2009	2010	2011	2012 ^e
METALS					
Aluminum:					
Bauxite, gross weight ^{e,3} thousand metric tons	160	160	--	--	69 ⁴
Alumina, metallurgical, gross weight ^e do.	592	348	481	470 ^r	430 ⁴
Metal:					
Primary do.	389	345	356	334	349 ⁴
Secondary do.	209	138	184	191	184 ⁴
Antimony, metal, including regulus ^e	500	500	500	500	500
Cadmium metal ^e	50	50	50	--	--
Cobalt, metal:	311	368	302	354	350
Gold, mine output, Au content ^e kilograms	1,500	1,500	1,500	--	--
Iron and steel:					
Metal:					
Pig iron thousand metric tons	11,372	8,104	10,137	9,698	9,532 ⁴
Ferroalloys, electric furnace:^e					
Ferromanganese do.	47	46	138	131	131
Ferrosilicon do.	100	20	27	59	59
Silicomanganese do.	60	54	62	63	63
Silicon metal do.	118	80	112	128	128
Other do.	60	60	60	60	60
Total do.	385	260	400	440	440
Steel:					
Crude do.	17,900	12,840	15,414	15,780	15,609 ⁴
Hot-rolled do.	14,746	11,382	13,581	13,715	13,529 ⁴
Lead, refined:^e					
Primary	--	--	--	-- ^r	--
Secondary	82,000	82,000	82,000	53,887 ⁴	75,000
Total	82,000	82,000	82,000	53,887 ⁴	75,000
Nickel, refinery products, Ni content ⁵	13,700 ^r	13,900 ^r	14,400 ^r	13,700 ^r	14,500
Tin, secondary ^e	1,500	1,500	1,500	--	--
Zinc metal, including slab and secondary	118,900	161,000	163,000	164,000	161,000

See footnotes at end of table.

TABLE 1—Continued
FRANCE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2008	2009	2010	2011	2012 ^e	
INDUSTRIAL MINERALS						
Abrasives, undifferentiated ^e	270	270	270	270	270	
Cement, hydraulic	thousand metric tons	21,400	18,300	17,998	19,433	18,000
Clays:						
Kaolin and kaolinitic clay (marketable)	do.	624	519	315	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
Gypsum and anhydrite, crude	do.	3,500 ^e	3,351	3,440	4,231	3,685 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	2,970 ⁴	3,517 ⁴	3,500	2,644 ⁴
Pigments, mineral, natural, iron oxide ^e		1,000	1,000	1,000	1,000	76,196 ⁴
Phosphates, Thomas slag ^e	thousand metric tons	50	50	50	50	50
Pumice and other natural abrasives ^e	do.	270	270	270	270	270
Salt, all sources ^e	do.	6,240	6,200	5,867 ⁴	5,430	5,457 ⁴
Sodium compounds: ^e						
Soda ash	do.	1,000	1,000	1,000	1,000	1,000
Sodium sulfate	do.	120	120	120	120	120
Stone, sand and gravel:						
Chalk	do.	580 ^e	1,294	1,765	2,733	1,702 ⁴
Dolomite, crude	do.	980 ^e	777	700	393 ^r	423 ⁴
Granite, crude	do.	370 ^e	403	426	482	233 ⁴
Limestone, agricultural and industrial	do.	11,700 ^e	8,302	9,102	10,666	10,216 ⁴
Marble and travertine, crude ^e	do.	150	150	150	150	150
Sand and gravel:						
Industrial sands		5,200 ^e	7,442	8,498	6,286	8,880 ⁴
Other sand, gravel, and aggregates		165,000 ^e	263,530	249,512	277,521	251,015 ⁴
Sandstone	thousand metric tons.	95 ^e	109	100	100 ^e	100
Slate, crude ^e		8,700	8,700	8,700	8,700	8,700
Sulfur, all sources ^e		650	650	650	650	650
Talc, crude ^e	thousand metric tons	420	420	420	420	420
MINERAL FUELS AND RELATED MATERIALS						
Asphaltic material ^e		20,000	11,675 ⁴	11,600	11,600	11,600
Carbon black		200,000 ^e	178,777	203,563	134,329	134,000
Coal, briquets ^e	thousand metric tons	100	100	100	100	100
Coke, metallurgical ^e	do.	4,500	4,500	4,500	4,500	4,500
Gas, natural, marketed	million cubic meters	1,472	1,444	1,245	1,132	1,100
Petroleum:						
Crude	thousand 42-gallon barrels	7,117	6,624	6,606	6,508	5,949 ⁴
Refinery products:						
Liquefied petroleum gas	do.	33,860	29,236	24,346	24,300	24,300
Gasoline, all kinds	do.	141,195	133,225	115,596	115,000	115,000
Kerosene and jet fuel	do.	44,462	39,274	35,113	35,100	35,000
Distillate fuel oil	do.	275,148	246,959	224,950	224,900	220,000
Residual fuel oil	do.	73,342	61,137	59,313	59,300	59,000
Other products	do.	124,347	107,748	106,617	106,600	106,000
Total	do.	692,354	617,579	565,900	565,200	559,000

^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 5, 2014.

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 2012

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, metallurgical		Alteo Holdings, 100%	Plant at Gardanne	700
Aluminum		Rio Tinto Ltd.	Aluminum smelters, of which:	
Do.		do.	Saint-Jean-de-Maurienne, Savoie	120
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
Cement		Four companies, of which the largest are:	80 plants, including:	26,700
Do.		Lafarge S.A.	14 plants, the largest of which is at St. Pierre-la-Cour (1,160)	10,000
Do.		Société des Ciment Français	Nine plants, the largest of which is at Gargenville (1,100)	7,500
Do.		Vicat Group	Five plants	6,000
Do.		Holcim Ciments S.A.S	Nine plants	5,900
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
Diatomite		Ceca S.A.	Mines and plants at Riom-les-Montagne and St. Bauzille	100
Feldspar		Denain-Anzin Minéraux S.A. (Imerys Group)	Mine and plant at St. Chely d'Apcher	55
Ferroalloys		Comilog Dunkerque (ERAMET S.A., 100%)	Dunkerque	70
Do.		FerroPem S.A. (Grupo Ferro Atlantica, 100%)	Six plants	290
Do.		Glencore Manganese France S.A. (Glencore International Plc., 100%)	Plant at Dunkerque	140
Gypsum		S.A. de Matériel de Construction	Mine at Taverny	1,500
Indium		Nyrstar S.A.	Plant at Auby	48
Iron and steel, steel:				
Crude		ArcelorMittal Group	Plant at Dunkerque	6,700
Rolling mill		do.	Plant at Fos-sur-Mer	4,200
Do.		do.	Plant at Florange ¹	3,200
Do.		do.	Plant at Gandrange, Neuves Maisons	8,400
Mica		Denain-Anzin Minéraux S.A. (Imerys Group)	Mine at Ploemeur, Brittany	160
Natural gas	million cubic meters	Total Group	Gasfield and plant at Lacq	20,000
Nickel, metal		Société Métallurgie le Nickel (SLN)	Plant at Sandouville	16
Nitrogen, N content of ammonia		GPN S.A.	Plant at Grandpuits, Grand-Quevilly, and Ottmarsheim	390
Petroleum:				
Crude	42-gallon barrels per day	Total S.A.	Paris Basin oilfields	1,000
Refined	do.	do.	Refineries at Gonfreville and La Mede	446,000
Do.	do.	Petroplus S.A.	Refinery at Petite-Couronne	285,000
Do.	do.	Total S.A.	Refinery at Feyzin	120,000
Do.	do.	do.	Refinery at Donges	200,000
Do.	do.	do.	Refinery at Grandpuits	96,000
Do.	do.	Ineos Group Ltd.	Refineries at Lavera	175,000
Do.	do.	Esso S.A.	Refineries at Fos-sur-Mer	62,000
Do.	do.	do.	Refineries at Gravenchon	237,000
Do.	do.	Cie. Rhenane de Raffinage (CRR) ²	Refinery at Reichstett	80,000
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		Total S.A.	Byproduct from natural gas, Lacq plant	3,000
Talc		Talc de Luzenac S.A. (Imerys. S.A., 100%)	Trimouns Mine near Ariege, Pyrenees	350
Zinc, metal		Nyrstar S.A.	Plant at Auby	172

Do. do., Ditto.

¹The Florange blast furnace was idle for all of 2012.

²Production operations terminated; conversion to petroleum product distribution in 2012.