



2012 Minerals Yearbook

SPAIN

THE MINERAL INDUSTRY OF SPAIN

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In 2012, Spain was a significant European producer of industrial mineral commodities, such as gypsum (third after China and Iran), sand and gravel (industrial) (fifth after the United States, Italy, Germany, and Australia), and fluorspar (sixth after China, Mexico, Mongolia, South Africa, and Russia), among others (table 1; Crangle, 2013; Dolley, 2013; Miller, 2013).

Spain encompasses almost 90% of the Iberian Peninsula, which is considered still to be the most mineralized zone in the European Union (EU), as it includes the volcanic massive sulfide (VMS) deposits of the Iberian Pyrite Belt (IPB). The IPB is more than 240 kilometers (km) in length and extends from Sevilla in southwestern Spain to south of Lisbon, Portugal; it hosts massive-sulfide and associated stockwork deposits that date from the Late Devonian to Middle Carboniferous periods. It varies in thickness from a few meters to several hundred meters and consists of a sequence of bimodal volcanics and associated pyroclastic and tuffaceous rocks. Within the IPB, at least 80 VMS deposits are thought to occur. About 1.7 billion metric tons of sulfides have been produced from the IPB. The leading polymetallic deposits include the Aguablanca nickel-copper mine, the Aguas Teñidas copper-lead-zinc mine, Las Cruces copper mine, the Masa Valverde copper-lead-zinc deposit, Los Santos tungsten mine, the Rio Tinto copper mine (which is the largest copper mine in Spain), the Slave gold project, and others, such as the Aljustrel, the Aznalcollar, the Neves-Corvo, the Scotiel, the Tharsis, and La Zarza Mines (Gibbons and Moreno, 2002, p. 473–510; Bastida and others, 2010; Cambridge Mineral Resources plc, 2013a, b; Lannin, 2013).

Spain has a long history of mining and has attracted interest from many large gold and base-metal mining companies. Several factors have contributed to this interest, including the highly prospective geology of the IPB and that of the Rio Narcea Belt, plus the gold discoveries at the Carlés and El Valle deposits at Boínas, Asturias, in northern Spain, and the Masa Valverde polymetallic volcanic-hosted massive-sulfide deposit at Andalucía in southeastern Spain. International mineral investment interest has also been encouraged by Spain's transparent legislative framework and positive fiscal environment for the extraction of natural resources, its well-developed infrastructure and skilled workforce, its long mining tradition and past success in exploration and mine development, and the availability of nonrefundable Government grants for both exploration and mine development (Cambridge Mineral Resources plc, 2013a, b; EMED Mining Public Ltd., 2013).

In 2012, Spain's gross domestic product (GDP) based on purchasing power parity decreased by 1.4% following an increase of 0.4% in 2011. The GDP in 2012 was \$1.515 trillion compared with a revised \$1.475 trillion in 2011, and the rate of inflation was 2.4% in 2012 compared with 3.1% in 2011. A new

law to ensure budgetary stability and financial sustainability was applied for the first time in 2012. Spain had a population of about 47.4 million in 2012. The total labor force was 23.05 million, of which services accounted for 71.7%; industry, 24.1%; and agriculture, 4.2%. In 2012, the mining and mineral processing industries contributed 0.8% of Spain's GDP and employed about 1% (55,600) of the industry total of 5.6 million (Sociedad Geológica de España, 2012, p. 9–11; Banco de España, 2013a, p. 27, 62–63; 2013b, p. 4–5; Federation of International Trade Associations, 2013a, b; Instituto Nacional de Estadística, 2013a; 2013b, p. 51).

Minerals in the National Economy

In 2012, Spain's most valuable mineral products included, in order of value, alumina, cement, coal, steel, gold, zinc, and copper. Spain was the fifth-ranked economy in the EU and, in spite of weak market confidence throughout the EU and reduction in foreign investment inflows in the second half of 2011 and early 2012, the country continued to attract the interest of many major world mining companies, which invested in prospecting and exploration for base metals, gold, and uranium (Banco de España, 2013a, p. 23–25; Instituto Nacional de Estadística, 2013b, p. 20, 24, 26).

Government Policies and Programs

Minerals are owned by the Government under an arrangement known as the *Regalía Principal*. The Mining Law of July 21, 1973, and the Hydrocarbon Law of October 7, 1998, continued to control Spain's mineral industry. The Dirección General de Política Energética y Minas implements these laws. Law 20 of June 5, 2006, modified the Finance Regime of the Sociedad Estatal de Participaciones Industriales (SEPI), which is a Government-owned holding company that has mining as one sector in its portfolio. In the mineral sector, SEPI owned 100% of Hulleras del Norte, S.A. (HUNOSA), which produced coal; 60% of Enusa Industrias Avanzadas, S.A. (ENUSA), which produced nuclear energy; 20% of Red Eléctrica Corporación, S.A. (RECSA), which produced electricity; and 5% of Enagás, S.A. (ENAGAS), which produced natural gas. The Instituto Geológico y Minero de España (IGME) is the principal Government science organization that provides assistance in the fields of geology and mining to the private and public sectors through the production of maps and scientific publications (Sociedad Estatal de Participaciones Industriales, 2013, p. 13–14, 19–20; Instituto Geológico y Minero de España, 2013).

Production

Production data for selected mineral commodities are in table 1. Spain continued to be a leading EU producer of natural sodium sulfate, slate, and strontium minerals and a regionally

significant processor of domestic and imported raw materials. In 2012, the sources of Spain's domestic energy production were nuclear (47.1%), biomass (18.9%), wind and solar power combined (14.1%), hydroelectric (10.5%), coal (8.8%), petroleum (0.4%), and natural gas (0.2%). Spain's energy consumption sources were petroleum (44.1%), natural gas (19.5%), coal (13.3%), renewable energies (10.3%), nuclear energy (9.6%), and hydroelectricity (3.2%) (BP p.l.c, 2013, p. 41; Instituto Nacional de Estadística, 2013c; International Energy Agency, 2013, p. 13, 23; Ministerio de Industria, Energía y Turismo, 2013).

Structure of the Mineral Industry

Data on the capacity and ownership of selected mineral operations are in table 2. The mineral industry was made up of a mix of Government-owned companies, joint ventures of public and private-sector companies, and privately owned companies. Spain's accession to the EU in January 1986 required the country to conform to EU guidelines. Spain followed the U.S.-EU mutual recognition agreements in its application of nontariff regulations and conformity assessment procedures (Banco de España, 2013a, p. 31, 37; 2013b, p. 20).

Cambridge Mineral Resources plc (CMR) of the United Kingdom, which owned the Lomero-Poyatos auriferous polymetallic massive-sulfide deposit, was one of the leading mining companies in Spain. Another of the leading mining companies, Ormonde Mining Plc of Ireland, was developing mining projects in Spain, including the Barruecopardo tungsten project, which is located in Salamanca Province, Castilla y Leon, in northwestern Spain. Another leading mining company, Orvana Minerals Corp. (OMC) of Canada, through its wholly owned subsidiary Kinbauri Gold Corp. (Kinbauri), owned and operated El Valle-Boinas/Carlés gold mines in the Rio Narcea gold belt in northwestern Spain in Oviedo Province, Asturias. The Asturias airport and the port city of Aviles are located approximately 40 km northeast of the property. Alcoa Inc. of the United States had six production centers across Spain. Alcoa was the leading alumina and aluminum producer in Spain, the sole producer of aluminum oxide (alumina) and primary aluminum, and a manufacturer of rolled products made from those materials (Alcoa Inc., 2013b; Ormonde Mining plc, 2013; Orvana Minerals Corp., 2013).

Mineral Trade

Spain's total exports amounted to \$292.0 billion and total imports amounted to \$328.0 billion in 2012 compared with a revised \$305.0 billion in exports and \$369.2 billion in imports, respectively, in 2011. In 2012, Spain's leading export partners were France (16.8%), Germany (10.8%), Italy (7.7%), Portugal (7.1%), and the United Kingdom (6.5%). Its leading import partners were Germany (11.8%), France (11.5%), Italy (6.7%), China (5.6%), the Netherlands (5.4%), and the United Kingdom (4.1%). The share of foreign trade in Spain's GDP was about 42.9% in 2012 compared with 45.7% in 2011. Mineral fuels and derivatives accounted for almost 5% of total exports and almost 15% of total imports; iron and steel, 3.3% of total exports and 4.3% of total imports; industrial minerals, 2.6% of total exports

and 3% of total imports; base metals, 2.3% of total exports and 2% of total imports; and aluminum, 1.2% of total exports and 1% of total imports. Spain's foreign direct investment (FDI) reached about \$27.8 billion in 2012 compared with more than \$26.8 billion in 2011, which represented an increase of more than 3.7%. The increase in FDI led to increased exports for Spain in 2012 (Federation of International Trade Associations, 2013a–c; Instituto Nacional de Estadística, 2013a, b; U.S. Central Intelligence Agency, 2013).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—Alcoa Inc., which was one of the world's leading alumina (aluminum oxide) producers, owned and operated the San Ciprian industrial complex on the east coast of Spain in Lugo Province, Galicia. In 2012, the San Ciprian facility produced 1.5 million metric tons (Mt) of aluminum oxide, calcinated alumina, and hydrate from bauxite. Bauxite for the facility was supplied mainly by Alcoa's mines in Brazil and Guinea. San Ciprian also produced 250,000 metric tons (t) of primary aluminum as ingots for casting, billets for extrusion, and sheets for lamination. The production of alumina (aluminum oxide) was used for the production of primary aluminum and chemical aluminum oxides for the ceramics and chemical sectors. About 70% of San Ciprian's alumina output was supplied to Alcoa's Aviles, Coruña, and San Ciprian aluminum smelters in Spain, and the remaining output was sold largely as hydrated alumina to European chemical manufacturers. San Ciprian's location allows commodity-grade alumina (aluminum oxide) to be sold within the EU without the high tariffs imposed on non-European suppliers. Alumina, alumina chemicals, alumina hydrates, and primary aluminum were produced by Aluminio/Alúmina Española, S.A. (AESA) in San Ciprian for domestic consumption and for export; primary aluminum was produced by Alcoa Inespal S.A. (AISA) at its 93,000-metric-ton-per-year (t/yr)-capacity smelter in Aviles Province, Asturias, and its 87,000-t/yr-capacity smelter in Coruña Province, Galicia, for domestic consumption and export (Alcoa Inc., 2013a, p. 12, 14; 2013b; Alumina Ltd., 2013).

Copper, Gold, Lead, Silver, and Zinc.—In 2012, Spain produced 75,057 t of copper content compared with 74,246 t in 2011, which was a slight increase of almost 1.1%. Gold output was 3,600 kilograms (kg) compared with a revised 3,550 kg in 2011. Output of secondary refined lead (125,000 t), silver (3,500 kg) and primary and secondary refined zinc (490,000 t) also remained at about the same levels as output in 2011. First Quantum Minerals Ltd. of Canada became one of the world's leading copper producers with its acquisition of Inmet Mining Corp. of Canada in March 2013. First Quantum owned Las Cruces copper mine, which is located on the eastern edge of the IPB about 15 km northwest of Sevilla Province in the Andalucía Region of Spain. As of December 31, 2012, Las Cruces had estimated proven and probable copper reserves of 14.1 Mt grading 5.44% copper. Las Cruces' designed production capacity was 72,000 t/yr of copper cathode as an end product and 1.0 Mt of copper ore for the period 2009 to 2022. In 2012,

Las Cruces produced 67,700 t of copper cathode compared with 42,000 t in 2011. First Quantum had a geographically diversified portfolio of development and operation projects and a strategic plan to produce more than 1.3 million metric tons per year (Mt/yr) of copper within 5 years; thus, in the near future, First Quantum could become a leading European copper producer and one of the top five copper producers in the world (First Quantum Minerals Ltd., 2013).

Cambridge Mineral Resources plc's (CMR's) Lomero-Poyatos auriferous polymetallic massive-sulfide deposit occurs within Devonian-age intermediate volcanoclastic rocks of the IPB. The deposit is located 30 km west of the Río Tinto Mine and 8 km west of the Aguas Teñidas Mine. CMR owned 100% of its local subsidiary Recursos Metálicos SA (RMSA), which held the mining licenses for the Lomero-Poyatos deposit, including the right to production. The licenses were valid for 45 years. The Lomero-Poyatos deposit was reported to contain reserves of 3.71 Mt at grades of, in order of value, 3.26 grams per metric ton (g/t) gold, 27.9 g/t silver, 0.87% copper, 1.57% lead, and 1.16% zinc at a 1.5 g/t gold-equivalent cutoff. CMR's wholly owned Spanish subsidiary Cambridge Minería España SL was the successful applicant for mineral exploration permits on the Masa Valverde polymetallic volcanic-hosted massive-sulfide deposit located in the central part of the IPB. The Masa Valverde cupriferous stockwork deposit contains a massive resource estimated to be more than 75 Mt at grades of, in order of value, 0.43 g/t gold, 22.4 g/t silver, 0.76% copper, 0.38% lead, and 1.28% zinc at a 1.0 g/t gold-equivalent cutoff. CMR was seeking significant joint-venture partners to develop both projects (Bastida and others, 2010; Cambridge Mineral Resources plc, 2013a, b).

In Spain, Ormonde's permits covered mineral prospects and occurrences with potential for high-grade vein-hosted deposits and large, bulk-tonnage low-grade deposits. Ormonde was exploring the Salamanca and the Zamora prospects for gold mineralization associated with granites. La Zarza deposit contains significant copper-gold-zinc resources and was also considered to be a potential source of silver; it is located in Huelva Province, Andalucía, in southwestern Spain in the IPB mining district. La Zarza deposit was estimated to contain 9.9 Mt of ore grading 3% zinc, 1% copper, 1% lead, 38.9 g/t silver, and 1.6 g/t gold; its inferred resources were 1.3 Mt grading 1.9% copper (Ormonde Mining plc, 2013).

Orvana's El Valle-Boinás/Carlés copper and gold skarn deposits had estimated proven and probable reserves of 7.7 Mt grading 3.30 g/t gold and 0.52% copper and inferred resources of 8.4 Mt grading 4.88 g/t gold and 0.39% copper. In February 2012, Orvana outlined a 10-year mine life and expected to produce an average of 2.3 t/yr (73,000 troy ounces per year) of gold and 2,570 t/yr of copper (Orvana Minerals Corp., 2013).

Asturiana de Zinc S.A. was owned by Xstrata plc of Switzerland. Xstrata's operations in Spain included the San Juan de Nieva zinc smelter and the Arnao zinc semis plant in Asturias and the Hinojedo roasting plant in Cantabria. Asturiana's core business was the refining and production of zinc metal, mainly zinc ingots. According to Asturiana, the San Juan de Nieva plant, which had the capacity to produce 510,000 t/yr of zinc metal, was the leading zinc smelter in the world and also one

of the world's lowest cost operations (Asturiana de Zinc S.A., 2013; Xstrata plc, 2013, p. 123, 127).

Minas de Aguas Teñidas S.A. (MATSA), which was a wholly owned Spanish subsidiary of Iberian Minerals Corp. of Switzerland, owned 100% of the Aguas Teñidas Mine. The mine is based on one of an east-west striking chain of VMS deposits on the northernmost limb of the IPB. According to MATSA, the Aguas Teñidas' geology is composed primarily of heavily tectonic volcano-sedimentary rocks with cross-cutting shear zones. The deposit is made up of four main mineralization types: polymetallic lead-zinc rock, massive cupriferous, barren pyrite, and a cupriferous stockwork (Iberian Minerals Corp., 2013).

Iron and Steel.—According to Worldsteel Association, Spain produced almost 3.6 Mt of iron and 16.1 Mt of crude steel in 2012 compared with 3.5 Mt and 15.6 Mt, respectively, in 2011. Compañía Española de Laminación S.A. (Celsa) produced about 2.5 Mt of steel in 2012. Celsa also produced corrugated and smooth round rods, rolled wire, flat rods, squares, angle rods, structural sections, and electro-welded mesh (Compañía Española de Laminación, S.L., 2013; Worldsteel Association, 2013a, b). Corporación Gerdau Sidor S.A. (Sidor), which was a leading producer of special steels in Spain, was planning to start producing stainless steel by modernizing the electric arc furnace at its works in Basauri in northern Spain (Corporación Gerdau Sidor S.A., 2013, p. 3, 14).

Nickel.—Spain produced 6,300 t of nickel content in concentrate, which is about the same amount that it produced in 2011. Lundin Mining Corp. of Canada's Aguablanca nickel-copper deposit (which is located in the Province of Badajoz, Extremadura Region, in southwestern Spain) consisted of an open pit and a processing facility with a production capacity of 1.9 Mt/yr of ore and 8,000 t/yr of nickel content, respectively. The initial open pit mine life was estimated to be 5 years based on mineral reserves of 14 Mt of ore grading 0.6% nickel, 0.5% copper, 0.47 g/t platinum-group metals, and 0.13 g/t gold. According to Lundin, mine instabilities reoccurred in the south wall of the open pit during the third quarter of 2012. Mining operations continued in the north side of the pit, which resulted in the production of 2,398 t of nickel and 2,260 t of copper in concentrate during the year. Lundin initiated a study on the future configuration of the open pit and anticipated having the study completed and the results available during the second quarter of 2013 (Lundin Mining Corp., 2013).

Tungsten.—According to Ormonde, the Barruecopardo tungsten project in western Spain is one of the premier undeveloped tungsten projects in the world outside of China. The company completed a feasibility study on February 12, 2012. The Barruecopardo project contains 27.4 Mt of tungsten reserves grading 0.26% WO₃. The development of an open pit would be based on measured and indicated mineral resources of 8.7 Mt at a grade of 0.32% WO₃. The planned production rate of 1.1 Mt/yr of ore was expected to produce about 227,000 t/yr of tungsten metal by late 2013 (Ormonde Mining plc, 2013).

Industrial Minerals

Cement.—In 2012, Spain's estimated cement output was 20.0 Mt compared with 22.2 Mt in 2011. According to the Spanish Cement Association, cement consumption decreased owing to the almost total paralysis of the construction industry and budget cuts in the public works sector. The decrease in demand accelerated in the first 9 months of 2012. For the year, domestic consumption decreased by 34.6% to 10.6 Mt and production decreased by 28.1% to 17.6 Mt compared with consumption and production, respectively, in 2011. Tudela Veguin S.A. of La Robla in southern Spain was one of the country's leading producers of clinker; Tudela's plant produced clinker at a rate of 2,600 metric tons per day (International Cement Review, 2013; Oficemen, 2013).

Fluorspar.—Spain's estimated fluorspar output was 128,090 t in 2012 compared with a revised 117,333 t in 2011. MINERSA, which was the EU's leading fluorspar producer, operated three fluorite deposits in Asturias in the north of Spain. MINERSA's production capacity was 150,000 t/yr of fluorspar, mainly acid grade, but also metallurgic and ceramic grades. MINERSA's fluorspar operations were located close to the deepwater Port of Aviles (Minerales y Productos Derivados S.A., 2013).

Potash.—In 2012, Spain produced an estimated 436,000 t of potash compared with 436,026 t in 2011. Iberpotash S.A., which manufactured and distributed potash and fertilizer as a subsidiary of Israel Chemicals Ltd. of Israel (also known as ICL Fertilizers Europe), was a leading producer of potash in the EU. In 2012, ICL announced the first stage of an efficiency plan for Iberpotash, which would include increasing the company's potash granulating capacity to meet increased demand for granulated potash, as well as construction of a plant at Suria to produce 1.5 Mt of vacuum salt for the food and chemical industries. Execution of this plan was expected to be completed in early 2014 at a cost of about \$260 million (160 million euros).¹ The second project, which had not yet been approved, would expand Suria's potash production capacity to 1.1 Mt of potash; the new capacity would include 630,000 t of granulated potash and 50,000 t ornamental potash (Iberpotash S.A., 2013).

Sepiolite.—In 2012, Spain's sepiolite output was at about the same level as that of 2011 (567,000 t). Grupo Tolsa S.A. (Tolsa), which was based in Toledo, had reserves of sepiolite in the River Tajo Basin that were thought to be about 20 Mt. Tolsa was the discoverer of sepiolite, which is a light mineral with a high capacity to absorb and retain water and which can be used to decrease rain runoff. Sepiolite is used in a variety of products and applications (Grupo Tolsa S.A., 2013).

Mineral Fuels and Other Sources of Energy

Spain has limited energy resources; thus, the country was strongly dependent upon imports of energy. Spain had no major oilfields, one natural gas field located offshore, and coal mines that contained mainly low-quality coal. In 2012, proved reserves of petroleum were estimated to be 150 million barrels; proved reserves of natural gas were estimated to be

2.5 billion cubic meters; and proved reserves of coal were estimated to be 530 Mt. Spain's petroleum refinery capacity was more than 1.5 million barrels per day (Mbbbl/d) (BP p.l.c., 2013, p. 16, 30; Instituto Nacional de Estadística, 2013b, p. 26, 48; U.S. Energy Information Administration, 2013).

Coal.—In 2012, estimated proved reserves of anthracite and bituminous coal amounted to 200 Mt, and subbituminous coal and lignite amounted to 330 Mt, for a total of 530 Mt. Spain's coal production decreased to about 6.3 Mt in 2012 from about 6.6 Mt in 2011. Coal continued to be Spain's most plentiful indigenous energy source; however, no production of lignite was reported during 2008 through 2012. Spain's coal consumption amounted to 23.1 Mt compared with 19.5 Mt in 2011 (BP p.l.c., 2013, p. 30; Instituto Nacional de Estadística, 2013c; Ministerio de Industria, Energía y Turismo, 2013; U.S. Energy Information Administration, 2013). Private companies produced most of the coal in the country, although the leading producer of bituminous coal was the HUNOSA Group, which was owned by the Government through the SEPI (Ministerio de Industria, Energía y Turismo, 2013).

Crude Oil.—Spain's annual production of crude oil was about 323,000 barrels (bbl) in 2012 compared with 234,000 bbl in 2011. Spain imported 1.180 Mbbbl/d, including from the Middle East (Saudi Arabia, Iran, Iraq, and others), 37.2%; Africa (Algeria, Libya, Nigeria, and others), 27.2%; Europe (the United Kingdom, Russia, and others), 17.2%; Latin America (Mexico, Venezuela, and others), 16.7%; and other countries, 1.7% (Instituto Nacional de Estadística, 2013c; Ministerio de Industria, Energía y Turismo, 2013; U.S. Energy Information Administration, 2013).

Natural Gas.—Spain's natural gas production was about the same level as that of 2011 (44 million cubic meters). Most of Spain's natural gas production came from one offshore field, Poseidon, which was operated by Repsol YPF S.A. of Argentina. The country's natural gas imports amounted to about 34.2 billion cubic meters and were from Algeria (37.8%), Nigeria (19.7%), Qatar (13.0%), Norway (8.2%), Trinidad and Tobago (6.9%), Egypt (6.5%), and other countries (7.9%) (BP p.l.c., 2013, p. 28; Instituto Nacional de Estadística, 2013c; Ministerio de Industria, Energía y Turismo, 2013; U.S. Energy Information Administration, 2013).

Renewable Energy.—In Europe, Germany and Spain continued to attract the majority of investments in wind power. In 2012, the wind power production capacity of the two countries totaled 54,104 megawatts (MW), which was more than 49% of the EU's total capacity of 109,581 MW. The leading European countries with wind power installations were Germany (31,308 MW) and Spain (22,796 MW) followed by the United Kingdom (8,445 MW), Italy (8,144 MW), France (7,564 MW), Portugal (4,525 MW), Denmark (4,162 MW), Sweden (3,745 MW), Poland (2,497 MW), the Netherlands (2,391 MW), Romania (1,905 MW), Greece (1,749 MW), Ireland (1,738 MW), Austria (1,378 MW), and Belgium (1,375 MW). In 2012, Spain's additional installed capacity was 1,122 MW compared with 1,050 MW in 2011, which was an increase of almost 7% (European Wind Energy Association, 2013, p. 4–5).

¹Where necessary, values have been converted from euro area euros (€) to U.S. dollars (US\$) at an annual average exchange rate of €0.809=US\$1.00.

Outlook

In spite of the double dip recessions (second half of 2008 through late 2009 and in late 2011 through 2012) in the Spanish economy and a crisis in the EU market that created a substantive decrease of foreign investment in early 2012, Spain continued to be a significant producer of such mineral commodities as, in terms of quantity, coal, iron ore, pyrites, copper, lead, zinc, and potash. Spain's economic downturn appears to have increased Government and community support for mining projects, however, particularly in the Iberian Peninsula. The IPB continues to be of interest to domestic and foreign mining companies and is a prime target for mineral exploration because of past discoveries of large VMS deposits. The Andalusian government was considering awarding an exploration license to EMED by mid-2013. EMED was planning to reopen the Río Tinto copper mine near Sevilla in late 2013 and expected to produce about 12 Mt/yr of copper ore by 2014 and to increase the mine's output to 15 Mt/yr by 2015. Spain's output of mineral fuels is not sufficient to satisfy domestic demand, and the country continued to be a large-scale importer of fuel minerals. Owing to the country's strong dependence on imported energy sources, the Government is expected to support and direct its attention toward renewable energy investments, such as biofuels, and geothermal, solar, and wind energy, while at the same time increasing its total installed capacity to meet increasing demand. In 2012, more renewable-energy-generating capacity was installed in Spain; renewable energy represented 25% of total new installed capacity. Nevertheless, Spain's current power sector continues to be dependent on coal, crude oil, and nuclear power (BP p.l.c., 2013, p. 41; EMED Mining Public Ltd., 2013; European Wind Energy Association, 2013, p. 7–8).

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TABLE 1
SPAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2008	2009	2010	2011	2012 ^P
METALS					
Aluminum:					
Alumina ^{e,3}	1,500,000 ⁴	1,500,000	1,500,000	1,500,000	1,500,000
Metal:					
Primary	408,000 ⁴	408,000	408,000	408,000	408,000
Secondary	243,000	243,000	243,000	243,000	243,000
Total	651,000	651,000	651,000	651,000	651,000
Copper:					
Mine output, Cu content	7,067	12,587	46,333 ⁵	74,246 ⁵	75,057 ⁵
Metal:^c					
Blister:					
Primary	259,900 ⁶	260,000	260,000	260,000	260,000
Secondary	10,000	10,000	10,000	10,000	10,000
Total	269,900 ⁶	270,000	270,000	270,000	270,000
Refined:					
Primary	255,000	255,000	255,000	255,000	255,000
Secondary	35,000	35,000	35,000	35,000	35,000
Total	290,000	290,000	290,000	290,000	290,000
Gold, mine output, Au content	3,400	3,450 ^r	3,500 ^r	3,550 ^r	3,600
Iron and steel, metal:					
Pig iron ^e	4,200	4,200	3,572 ⁵	3,540 ⁵	3,570 ⁵
Steel:					
Crude ⁷	18,600	14,400	16,343 ⁵	15,591 ⁵	15,600
Hot rolled	15,000	15,000	15,000	15,000	15,000
Lead, metal, refined, secondary	125,000	125,000	125,000	125,000	125,000
Nickel, Ni content of concentrate	8,136	8,035	5,402 ⁵	6,296 ⁵	6,300
Silver, mine output, Ag content	3,450 ^r	3,500 ^r	3,500 ^{r,e}	3,505 ^r	3,500 ^e
Tungsten, mine output ⁸	150	200	229	497	542
Zinc, metal, primary and secondary	456,050	500,776	505,000	489,000 ⁵	490,000

See footnotes at end of table.

TABLE 1—Continued
 SPAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2008	2009	2010	2011	2012 ^p
INDUSTRIAL MINERALS					
Barite, BaSO ₄	11,100	2,814	2,050 ^s	NA	NA
Cement, hydraulic	42,088	29,505	26,217	22,200	20,000
Clays:					
Bentonite	154,534	140,000	157,001 ^s	110,721 ^s	110,750
Kaolin, washed	355,739	300,000	310,993 ^s	302,580 ^s	303,000
Diatomite and tripoli ^e	50,000	29,194 ^s	64,346 ^s	50,000	50,000
Feldspar	690,256	597,496 ^s	691,894 ^s	580,000	580,000 ^e
Fluorspar, CaF ₂ content:					
Acid-grade	127,300	111,810	126,730 ^s	109,284 ^s	120,000
Ceramic-grade	15,930	6,485	1,824 ^s	2,639 ^s	2,640
Metallurgical-grade	5,506	4,238 ^s	3,787 ^s	5,410 ^s	5,450
Total	148,736	122,533 ^s	132,341 ^s	117,333 ^s	128,090
Gypsum and anhydrite, crude ^c	15,000	11,500	6,990 ^s	7,400 ^r	7,100
Lime, hydrated and quicklime ^e	2,000	2,000	2,200	2,200	2,200
Magnesite, calcined	187,626	163,930	195,893 ^s	200,000 ^s	200,000
Mica	4,254	4,000	4,034 ^s	3,775 ^s	3,775
Potash, K ₂ O equivalent ^e	435,000	481,455 ^s	418,778 ^s	436,026 ^s	436,000
Pumice	600,000	436,542 ^{r,s}	432,364 ^{r,s}	430,500	430,500
Salt:					
Rock, including byproduct from potash works	2,850	2,850	3,116 ^{r,s}	3,200 ⁶	3,200
Marine and other	1,291	1,439 ^{r,s}	1,234 ^{r,s}	1,171 ⁶	1,185
Sand and gravel, silica sand ⁹	134,000	134,000	170,000 ^{r,s}	130,000	130,000
Sepiolite, meerschaum	707,950	573,937 ^{r,s}	557,862 ^{r,s}	566,970 ⁶	567,000
Sodium compounds, n.e.s., sulfate, natural: ^{e,10}					
Glauberite, Na ₂ SO ₄ content	9,500,000	1,121,784 ^{r,s}	1,216,787 ^{r,s}	1,200,000 ^e	1,200,000
Thenardite, Na ₂ SO ₄ content	165,000	166,362 ^s	156,776 ^s	160,000	160,000
Stone: ^e					
Basalt	5,000	2,703 ^s	2,252 ^s	3,000	3,000
Chalk	1,000	744 ^s	679 ^s	700	700
Dolomite	15,000	13,843 ^s	10,431 ^s	12,000	12,000
Granite, ornamental	12,500	20,964 ^s	12,464 ^s	12,500	12,500
Limestone	270,000	195,138 ^s	134,864 ^s	170,000	170,000
Marble, ornamental	2,600	1,669 ^s	1,209 ^s	1,600	1,600
Marl	10,000	9,000 ^s	8,057 ^s	8,000	8,000
Ophite	4,000	5,181 ^s	3,446 ^s	4,000	4,000
Phonolite	1,800	1,011 ^s	1,018 ^s	1,200	1,200
Porphyry	1,100	2,682 ^s	1,548 ^s	1,550	1,550
Quartz	1,100	789 ^s	1,129 ^s	1,100	1,100
Quartzite	2,800	4,685 ^s	2,500 ^s	2,500	2,500
Sandstone	3,400	2,905 ^s	2,219 ^s	2,400	2,400
Slate	1,200	416 ^s	357 ^s	380	380
Other	8,000	8,418 ^s	8,000 ^s	8,000	8,000
Strontium minerals, Sr ₂ O ₄ content	188,000 ^e	57,466 ^s	83,035 ^s	97,102 ^s	97,100
Sulfur, byproduct: ^e					
Metallurgy	500	536	539	539	540
Petroleum	136 ^r	136 ^r	136 ^r	136 ^r	140
Coal (lignite) gasification	1	1	1	1	1
Total	637 ^r	673 ^r	676 ^r	676 ^r	681
Talc and steatite	100,000	47,218 ⁶	51,897 ⁶	52,000	52,000

See footnotes at end of table.

TABLE 1—Continued
 SPAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2008	2009	2010	2011	2012 ^p	
MINERAL FUELS AND RELATED MATERIALS						
Coal, marketable:						
Anthracite	thousand metric tons	7,238	7,700	5,990 ⁵	4,265 ⁵	4,073
Bituminous	do.	2,890	2,892	2,444 ⁵	2,358 ⁵	2,252
Total	do.	10,128	10,592	8,434 ⁵	6,623 ⁵	6,325
Gas, natural						
Produced	thousand cubic meters	46,354	32,280	58,425 ⁵	43,888 ⁵	44,000
Peat		60,000	58,678 ⁵	64,962 ⁵	65,000	65,000
Petroleum:						
Crude	thousand 42-gallon barrels	298	250	284 ⁵	234 ⁵	323
Refinery products: ⁶						
Liquefied petroleum gas	do.	34,240 ⁶	34,200	34,200	34,200	34,100
Naphtha	do.	25,401 ⁶	25,400	25,400	25,400	25,300
Gasoline, motor	do.	89,006 ⁶	89,000	89,000	89,000	88,700
Jet fuel	do.	21,540 ⁶	21,500	21,500	21,500	21,400
Kerosene	do.	16,257 ⁶	16,300	16,300	16,300	16,200
Distillate fuel oil	do.	113,740 ⁶	114,000	114,000	114,000	113,500
Residual fuel oil	do.	58,220 ⁶	58,200	58,200	58,200	58,000
Other	do.	81,284 ⁶	81,300	81,300	81,300	81,000
Refinery fuel and losses	do.	26,417 ⁶	26,400	26,400	26,400	26,300
Total	do.	466,105 ⁶	466,000 ^r	466,000 ^r	466,000 ^r	465,000

⁶Estimated; estimated data are rounded to no more than three significant digits; may not add to total shown. ^pPreliminary. ^rRevised. do. Ditto.

NA Not available.

¹Table includes data available through October 18, 2013.

²In addition to the mineral commodities listed, Spain had produced attapulgit, ferroalloys, germanium oxide, other clays, pigment ochre and red iron oxide, sand and gravel (industrial), soda ash and sulfate (manufactured), coke (metallurgical), and natural gas (marketed).

³Reflects aluminum hydrate.

⁴Reported figure. Source: Alcoa Inc., 2012 Annual Report.

⁵Reported figure. Source: Minerals Questionnaires for 2011 and 2012.

⁶Reported figure.

⁷Reported figure. Source: Worldsteel Association, December 2012.

⁸Reported figure. Source: Heemskirk, Almonty, December 2012.

⁹Includes sand obtained as a byproduct of feldspar and kaolin production.

¹⁰Not elsewhere specified.

Sources: Industria y Minería, 2012. Ministerio de Industria, Turismo y Comercio—Secretaría General de Energía, 2012. Instituto Geológico y Minero de España, 2012.

TABLE 2
SPAIN: 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	Aluminio/Alúmina Española S.A. (AES) (Alcoa Inc., 100%)	Alumina plant at San Ciprian, Lugo	1,500
Aluminum	do.	Electrolytic plant at San Ciprian, Lugo	228
Do.	Alcoa Inespal S.A. (AISA) (Alcoa Inc., 100%)	Electrolytic plant at Aviles	93
Do.	do.	Electrolytic plant at La Coruña	87
Barite	Minerales y Productos Derivados S.A. (MINERSA)	Mine and plant at Vera, Almería	100
Bentonite	Süd-Cheme España SL	Mine and plant at Yuncos, Toledo	150
Cement	Ashland S.A.	Puerto de Sagunton, Valencia	2,000
Do.	do.	Villaluenga de la Sagra, Toledo	2,000
Do.	do.	3 other plants	2,000
Do.	35 other companies	49 other plants	38,000
Coal:			
Anthracite	Antracitas Gaiztarro S.A.	Mines at María and Paulina	2,000
Do.	do.	Mines near Oviedo	2,000
Do.	Antracitas del Bierzo S.A.	Mines near Leon	1,000
Bituminous	Hulleras del Norte S.A. (HUNOSA)	Various mines and plant	3,300
Do.	Hulleras Vasco Leonesa S.A.	Santa Lucía Mine, León	2,000
Do.	Minas de Figaredo S.A.	Mines near Oviedo	1,000
Do.	Nacional de Carbon del Sur (Encasur)	Rampa 3 and San José Mines, Cordoba	200
Lignite	Empresa Nacional de Electricidad S.A. (Endesa)	As Pontes Mine, and Andorra Mine, La Coruña	15,000
Copper, metal, content	Atlantic Copper S.A. (Freeport MacMoRan Copper & Gold Inc., 100%)	Refinery at Huelva	270
Do.	do.	Electrolytic refinery at Huelva	105
Do.	Industrias Reunidas de Cobre	Smelter at Asua-Bilbao	30
Do.	Elmet SL	Smelter and electrolytic refinery at Berango, Vizcaya	60
Do.	Atlantic Copper S.A. (Freeport MacMoRan Copper & Gold Inc., 100%)	Mines and plant at Ariertero near Santiago de Compostela	12
Do.	do.	Alfredo underground mine in Río Tinto area	30
Do.	Inmet Mining Corp., 100%	Open pit mines in Sevilla, Andalucía, Spain	210
Do.	do.	Cathode Electrowinning at Las Cruces in Sevilla	72
Do.	Minas de Río Tinto S.A.	Cerro Colorado open pit mine	20
Do.	Río Narcea Gold Mines, Ltd. (Lundin Mining Corp., 100%)	Aguablanca Mine, Extremadura	7
Dunite	Pasek España S.A.	Mines and plant at Landoy, Ortiueira	1,500
Fluorspar	Minerales y Productos Derivados S.A. (MINERSA)	Plant at Torre, Asturias	150
Do.	do.	Underground mines at Emilio, Jaimina, and Moscona, Asturias	420
Gold kilograms	Río Narcea Gold Mines, Ltd.	El Valle and Carlés Mines, Asturias	3,750
Lead, metal, content	Española del Zinc S.A.	Refinery at Cartagena, Murcia	50
Do.	Compañía La Cruz, Minas y Fundaciones de Plomo S.A.	Smelter at Lineares, Jaen	40
Do.	do.	Refinery at Lineares, Jaen	40
Do.	Tudor S.A.	Secondary smelter at Saragoza	16
Do.	Ferroaleaciones Españolas, S.A.	Secondary smelter at Medina del Campo	12
Do.	Derivados de Minerales y Metales	Secondary smelter at Barcelona	5
Do.	Sociedad Minera y Metalúrgica de Peñarroya de España S.A. (Peñarroya, France, 90%)	Opencast mine at Montos de Los Azules	25
Do.	Exploración Minera Internacional España S.A. (EXMINESA)	Underground mine at Rubiales, Lugo	16
Magnesite	Magnesitas Navarras S.A.	Mine at Eugui, plant at Zubiri	600
Do.	Magnesitas de Rubián S.A.	Plant at Monte Castel	70
Do.	SA Reverte	Plant at Zaragoza	443
Nickel, metal, content	Río Narcea Gold Mines, Ltd. (Lundin Mining Corp., 100%)	Aguablanca Mine, Extremadura	8

See footnotes at end of table.

TABLE 2—Continued
 SPAIN: 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
Petroleum:				
Crude	42-gallon barrels per day	Chevron S.A.	Oilfield at Casablanca	300
Refined	do.	Repsol YPF, S.A.	Refinery at Escombreras	200,000
Do.	do.	do.	Refinery at Puertollano	14,000
Do.	do.	do.	Refinery at Tarragona	260,000
Do.	do.	Refinería de Petróleos del Norte S.A. (Petronor)	Refinery at Somorrostro	240,000
Do.	do.	Compañía Española de Petróleos S.A. (Cepsa) [Total SA, 51.17%, and International Petroleum Investment Co. (IPIC), 48.83%]	Refinery at Gibraltar-San Roque	88,000
Do.	do.	do.	Refinery at La Rabida	35,000
Do.	do.	do.	Refinery at Tenerife	37,000
Do.	do.	Petróleos del Mediterraneo S.A. (Petromed)	Refinery at Castellon de la Plana	120,000
Do.	do.	BP p.l.c., 100%	Refinery at Castellon, Iberia	45,000
Do.	do.	Compañía Ibérica Refinadora de Petróleos S.A. (Petroiber)	Refinery at La Coruña	140,000
Potash, ore		Iberpotash S.A. (ICL Fertilizers Europe)	Mines and plants at Suria near Barcelona	1,100
Pyrite		Compañía Española de Mines de Tharsis	Mines and plants at Tharsis and Zarza (closed)	1,300
Do.		do.	Plant at Huelva	600
Sepiolite		Grupo Tolsa S.A.	Mine and plant at Vicalvaro near Madrid	1,000
Do.		Silicatos-Anglo-Ingleses S.A.	Mine and plant at Villecas near Madrid	200
Silver	metric tons	Polar Minin Oy (Dragon Mining NL, 50%, and Ormonde Mining plc, 50%)	Valiña silver project, Lugo Province	4
Sodium sulfate		Crimidesa S.A.	Mine and plant at Cerezo de Rio, Burgos	600
Steel		Aceralia Corporación Siderúrgica (Arbed S.A., 35%)	Plants at Aviles, Gijon, Sagunto, and Sestao	8,000
Do.		Compañía Española de Laminacion S.L. (Celsa), 100%	Plant at Barcelona	2,600
Do.		Corporación Gerdau Sidenor S.A. (Sidenor) (Gerdau Group, 50%, and Santander Group, 50%)	Plant at Basauri	2,500
Strontium		Solvay Minerales S.A.	Mines and plant at Escuzar, Granada	85
Do.		Bruno S.A.	Mine and plant at Montevides, Granada	50
Uranium, U ₃ O ₈	metric tons	Empresa Nacional del Uranio (Enusa) (Government, 100%)	Mines and plant near Ciudad Real	500
Zinc, metal, content		Asturiana de Zinc S.A. (Azsa) (Xstrata plc, 100%)	Electrolytic zinc plant at San Juan de Nieva Castillon	510
Do.		Española del Zinc S.A.	Electrolytic plant at Cartagena	50
Do.		Exploración Minera Internacional España S.A. (EXMINESA)	Underground mine at Rubiales, Lugo	500
Do.		Sociedad Minera y Metalúrgica de Penarroya-Espana S.A.	Mines and plants at Montos de los Azules y Sierra de Lujar, San Agustín	200

Do., do. Ditto.