



2011 Minerals Yearbook

SPAIN

THE MINERAL INDUSTRY OF SPAIN

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In 2011, Spain was a significant European producer of industrial mineral commodities, such as gypsum (third after China and Iran), fluorspar (sixth after China, Mexico, Mongolia, South Africa, and Russia), and sand and gravel (industrial) (fifth after the United States, Italy, Germany, and Australia), among others (table 1; Crangle, 2012; Dolley, 2012; Miller, 2012).

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 Seville 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 were produced from the IPB. Historically, the leading polymetallic deposits in the Spanish part of the IPB have included Aguas Tenidas, Aznalcollar-Los Frailes, Las Cruces, Rio Tinto, Sotiel-Migollas-Masa Valverde, Tharsis, Vallejin, and La Zarza (Gibbons and Moreno, 2002, p. 473–510; Calvo and Pardo, 2012).

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 in southern Spain and the Rio Narcea Belt and the gold discoveries at the Carles and El Valle deposits at Boinas, Asturias, in northern 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 (Bastida and others, 2010, p. 597–622; Cambridge Mineral Resources plc, 2012; EMED Mining Public Ltd., 2012a, b).

In 2011, Spain's gross domestic product (GDP) increased by 0.7% following a decrease of 0.1% in 2010. The GDP in 2011 was \$1.43 trillion compared with \$1.42 trillion in 2010, and the rate of inflation was 3.1% in 2011 compared with 2% in 2010. Spain had a population of about 47.2 million in 2011. The total labor force was 23.1 million, of which services accounted for 71%; industry, 25.8%; and agriculture, 3.2%. In 2011, the mining and mineral processing industries contributed 0.8% of Spain's GDP and employed about 1% (60,000) of the industry total of 6 million (Banco de España, 2012b, p. 28; The Federation of International Trade Associations, 2012b; Instituto Nacional de Estadística, 2012b; Sociedad Geológica de

España, 2012, p. 9–11; U.S. Central Intelligence Agency, 2012; U.S. Department of State, 2012).

Minerals in the National Economy

In 2011, Spain's most valuable mineral products included, in order of value, alumina, cement, coal, steel, gold, zinc, and copper. The international financial crisis that began in 2008 had consequences for the global economy and affected the Spanish economy as well. Spain was the fifth ranked economy in the EU and, in spite of weak market confidence in the EU and a sharp reversal of foreign investment inflows in the second half of 2011 and early 2012, it continued to attract interest from many major world mining companies for base-metals, gold, and uranium prospecting and exploration (Banco de España, 2012a, p. 28; Instituto Nacional de Estadística, 2012b).

Government Policies and Programs

Minerals are owned by the state under an arrangement known as the *Regalía Principal*. The Mining Law of July 21, 1973, and the Hydrocarbon Law of October 7, 1998, govern the mineral industry of Spain. 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; 100% of Minas de Almadén y Arrayanes, S.A. (MAYASA), which in the past produced mercury; 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 mineral-resource agency. IGME offers 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, 2012, p. 14–15, 21, 23).

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 2011, the sources of Spain's domestic energy production were nuclear (48.6%), biomass (18.2%), geothermal and solar (16.8%), hydropower (8.6%), coal (7.4%), petroleum (0.3%), and natural gas (0.1%). Spain's energy consumption sources were petroleum (44.9%), natural gas (22.3%), electricity (18.6%), nuclear (11.6%), renewable energies (2.0%), and coal (0.6%)

(BP p.l.c., 2012, p. 41; Instituto Nacional de Estadística, 2012a; Ministerio de Industria, Energía y Turismo, 2012).

Structure of the Mineral Industry

Data on the capacity and ownership of selected mineral operations are listed in table 2. The mineral industry was made up of a mix of Government-owned companies, joint ventures of state and private-sector-owned companies, and privately owned companies. Spain's accession to the EU in January 1986 required the country to open its economy to trade and investment, modernize its industrial base, improve infrastructure, and revise economic legislation to conform to EU guidelines. Spain followed the U.S.–EU mutual recognition agreements in its application of nontariff regulations and conformity assessments procedures (Banco de España, 2012b).

In Spain, the leading mining company was Cambridge Mineral Resources plc (CMR) of the United Kingdom, which owned the Lomero-Poyatos auriferous polymetallic massive-sulfide deposit. Another leading mining company, Ormonde Mining plc of Ireland, was developing mining projects in Spain, including the Barruecopardo tungsten project in Salamanca Province in western Spain. Another leading mining company, Orvana Minerals Corp. (OMC) of Canada, acquired Kinbauri Gold Corp. (a subsidiary of Rio Narcea Gold Mines, Ltd.), which owned El Valle-Boinas/Carles copper and gold skarn deposits in the Rio Narcea gold belt in northern Spain, close to the port city of Aviles (Ormonde Mining plc, 2012; Orvana Minerals Corp., 2012). Alcoa Inc. of the United States owned eight 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 with those materials (Alcoa Inc., 2012b).

Mineral Trade

Spain's total exports amounted to \$438.0 billion and total imports amounted to \$453.4 billion in 2011 compared with a revised \$367.5 billion in exports and \$398.9 billion in imports, respectively, in 2010. In 2011, Spain's leading export partners were France (17.8%), Germany (10.6%), Italy and Portugal (8.3% each), and the United Kingdom (6.7%). Its leading import partners were Germany (13%), France (11.8%), Italy (6.7%), China (5.8%), the Netherlands (5%), and the United Kingdom (4.5%). The share of foreign trade in Spain's GDP was about 62.3% in 2011 compared with 53.9% in 2010 and included about 30.6% for exports and 31.7% for imports, respectively. Mineral fuels and derivatives accounted for almost 5% of total exports and almost 15% of total imports; aluminum accounted for 1.2% of total exports and 1% 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; and base metals, 2.3% of total exports and 2% of total imports, respectively (Federation of International Trade Associations, 2012a, b; Instituto Nacional de Estadística, 2012a, b; U.S. Central Intelligence Agency, 2012).

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 located in Lugo Province on the east coast of Spain. In 2011, the San Ciprian facility produced 1.3 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) smelters in the Province of Aviles [production capacity of about 93,000 metric tons per year (t/yr)] and La Coruña (production capacity of about 87,000 t/yr), also for domestic consumption and for export (Alcoa Inc., 2012a, p. 3, 7, 47–48; 2012b; 2012c; Alumina Ltd., 2012).

Copper, Gold, Lead, Silver, and Zinc.—In 2011, Inmet Mining Corp. (Inmet) of Canada had a 100% interest in Las Cruces copper mine. Las Cruces is a high-grade VMS copper deposit located on the eastern edge of the IPB about 15 km northwest of Seville Province. Las Cruces had estimated proven and probable copper reserves of 17.6 Mt grading 6.2% copper. Las Cruces' 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 2011, Inmet mined 1.1 Mt of copper ore and produced 42,000 t of copper cathode compared with 28,500 t in 2010. According to Inmet, Las Cruces unit could produce 61,700 to 68,600 t of copper cathode in 2012 (Inmet Mining Corp., 2012a, p. 10–11, 37–38; 2012b).

EMED Mining Public Ltd. was planning to re-open the Rio Tinto copper mine near Seville in late 2013 and expected to produce about 12 million metric tons per year (Mt/yr) of copper ore by 2014 and increase the mine's output to 15 Mt/yr by 2015 (EMED Mining Public Ltd., 2012a, b).

CMR's Lomero-Poyatos deposit occurs within Devonian-age intermediate volcanoclastic rocks of the IPB. The deposit is located 30 km to the west of Rio Tinto Mine and 8 km to the 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 auriferous polymetallic massive-sulfide deposit, including the right to production. The licenses were valid for 45 years. CMR was planning to sell RMSA or enter into a joint-venture partnership in 2011

and 2012 (Bastida and others, 2010; Calvo and Pardo, 2012; Cambridge Mineral Resources plc, 2012).

CMR's Lomero-Poyatos auriferous polymetallic massive-sulfide deposit, which is located near San Telmo, 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 was seeking to sell RMSA or to get significant joint-venture partners to develop the project.

Ormonde was exploring the Salamanca-Zamora area for gold mineralization associated with granites. The company considered this area to be one of the most prospective gold terrains in Spain. Ormonde's permits cover mineral prospects and occurrences with potential for high-grade vein-hosted deposits and large, bulk tonnage low-grade deposits (Cambridge Mineral Resources plc, 2012).

Ormonde's La Zarza deposit contains significant copper-gold-zinc resources and was also considered to be a potential source of silver. The deposit is located in Huelva Province 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. The company conducted an expanded exploration program targeted at defining a large copper resource. The program was being funded through a joint venture with the Chilean copper producer Antofagasta Minerals S.A. (AMSA). AMSA had the right to earn a 51% interest in La Zarza during a 3-year period by spending \$7 million on additional exploration and subsequent evaluation activities. AMSA would have the right to increase its interest to 75% after the completion of a feasibility study on La Zarza. Spain's estimated silver production in 2011 remained at about the same level as that of 2010 (3,400 kg) (Ormonde Mining plc, 2012).

OMC's El Valle-Boinas/Carles copper and gold skarn deposits had estimated measured and indicated reserves of 8.3 Mt grading 4.84 g/t gold and 0.65% copper and inferred resources of 8.4 Mt grading 4.88 g/t gold and 0.39% copper. In February 2012, OMC outlined a 10-year mine life and expected to produce an average of 2.3 t (73,000 troy ounces) of gold and 2,570 t of copper annually (Orvana Minerals Corp., 2012).

Spain's zinc metal output was 489,000 t compared with 505,000 t in 2010. Asturiana de Zinc S.A. was owned by Xstrata plc of Switzerland. Xstrata's operations in Spain comprised 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 a capacity of 511,000 t/yr of zinc metal, was the leading zinc smelter in the world and also one of the world's lowest cost operations. Masa Valverde's zinc and copper mineralization contains resources of almost 12 Mt of zinc grading 3% zinc; 80 Mt of copper grading 0.5% copper; and 16.2 Mt of gold grading 1 g/t gold (Asturiana de Zinc S.A., 2012, p. 53–54; Cambridge Mineral Resources plc, 2012; Xstrata plc, 2012).

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 comprises four main mineralization types: polymetallic lead-zinc rock, massive cupriferous, barren pyrite, and a cupriferous stockwork (Iberian Minerals Corp., 2012a, p. 14; 2012b).

Iron and Steel.—According to Worldsteel Association, Spain produced more than 3.5 Mt of iron and 15.6 Mt of crude steel in 2011 compared with 3.6 Mt and 16.3 Mt in 2010, respectively. Compañía Española de Laminación S.A. (Celsa) produced more than 2.4 Mt of steel in 2011. 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.A., 2012; Worldsteel Association, 2012a, 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., 2012).

Nickel.—Lundin Mining Corp. of Canada's Aguablanca nickel-copper deposit (which is located in southwestern Spain in the Province of Badajoz) 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 10.5 years based on mineral reserves of 15 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 operations were suspended in December 2010 owing to a pit slope failure. Some open pit operations restarted during the third quarter of 2011 to repair the main ore haulage ramp, and 24,289 t of ore was produced. Concentrate output was expected to recommence prior to the end of 2012 (Lundin Mining Corp., 2012).

Tungsten.—Ormonde's progress towards the development of the Barruecopardo tungsten project continued during the year with an assessment of mining operations, metallurgical work, and preparation of documentation required for the project permitting process. In 2011, Barruecopardo's measured and indicated mineral resources amounted to 27.4 Mt at a grade of 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, 2012).

Industrial Minerals

Cement.—In 2011, Spain's estimated cement output was 20.7 Mt compared with a revised 26.2 Mt in 2010. 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. 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 (t/d) (Oficemen, 2012; Polysius AG, 2012).

Fluorspar.—Spain's fluorspar output decreased to 117,333 t in 2011 compared with revised 132,341 t in 2010. 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., 2012).

Potash.—In 2011, Spain produced 436,026 t of potash compared with 418,778 t in 2010. 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 includes increasing 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). The second project, which had not yet been approved, would expand Suria's potash production capacity to produce 1.1 Mt of potash, of which 630,000 t would be granulated potash and 50,000 t would be technical potash (Iberpotash S.A., 2012).

Sepiolite.—Spain's sepiolite output was 566,970 t in 2011 compared with a revised 557,862 t in 2010. 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 decrease rain runoff that is used in a variety of products and other applications (Grupo Tolsa S.A., 2012).

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 2011, 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 almost 1.5 million barrels per day (Mbbbl/d) (BP p.l.c., 2012, p. 16, 30; Instituto Nacional de Estadística, 2012a; U.S. Energy Information Administration, 2012).

Coal.—In 2011, 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 6.6 Mt in 2011 from about 8.4 Mt (revised) in 2010. Coal continued to be Spain's most plentiful indigenous energy source; however, no production of lignite was reported during 2008 through 2011. Spain's coal consumption amounted to 19.5 Mt compared with 10.2 Mt in 2010 (BP p.l.c., 2012, p. 30; Ministerio de Industria, Energía y Turismo, 2012; U.S. Energy Information Administration, 2012).

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, 2012).

Crude Oil.—Spain's production of crude oil was about 234,000 barrels (bbl) in 2011 compared with a revised output of 284,000 bbl in 2010. Owing to the low level of domestic crude oil production, Spain imported 1.346 Mbbbl/d from Russia (15.7%), Iran (12%), Saudi Arabia (11.1%), Mexico (10.8%), Nigeria (10.3%), Libya (9.6%), and other countries (30.5%) (Instituto Nacional de Estadística, 2012a; Ministerio de Industria, Energía y Turismo, 2012; U.S. Energy Information Administration, 2012).

Natural Gas.—Natural gas production decreased to 43,888 thousand cubic meters in 2011 from 58,425 thousand cubic meters (revised) in 2010. 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 35.5 billion cubic meters and were from Nigeria (27.3%), Qatar (19.8%), Algeria (16.5%), Trinidad and Tobago (10.3%), Egypt (9.4%), and other countries (16.7%) (BP p.l.c., 2012, p. 28; Instituto Nacional de Estadística, 2012a; Ministerio de Industria, Energía y Turismo, 2012; U.S. Energy Information Administration, 2012).

Renewable Energy.—In Europe, Germany and Spain continued to attract the majority of investments in wind power. In 2011, the wind power production capacity of the two countries totaled 50,734 megawatts (MW), which was about 54% of the EU's total capacity of 93,957 MW. The leading European countries with wind power installations were Germany (29,060 MW) and Spain (21,674 MW) followed by France (6,800 MW), Italy (6,747 MW), the United Kingdom (6,540 MW), Portugal (4,083 MW), Denmark (3,871 MW), Sweden (2,907 MW), and Ireland (1,631 MW) (European Wind Energy Association, 2012, p. 4–5).

Outlook

In spite of the continuing economic recession, Spain continued to be a significant producer, in terms of volume, of such mineral commodities as coal, iron ore, pyrites, copper, lead, zinc, and potash. The country has one of Europe's most diversified mining sectors, which produces mostly industrial minerals and stone. Throughout 2011, market confidence remained weak, and Spain saw a substantive reversal of foreign investment in the second half of 2011 and early 2012. For instance, Alcoa announced that production would be curtailed by mid-2012 at its Aviles and La Coruña aluminum smelters, which have production capacities of 93,000 t/yr and 87,000 t/yr, respectively. The cuts in production, however, are planned to be partial and temporary. An uncompetitive energy position combined with rising raw material costs and falling aluminum prices, which decreased by more than 27% from their peak in 2011, led to the planned curtailment of the facilities (Alcoa Inc., 2012c).

The 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. 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, geothermal, solar, and wind while at the same time increasing its total installed capacity to meet increasing demand. In 2011, more renewable generating capacity was installed in Spain; renewables represented 23% of total new installed capacity. Nevertheless, Spain's power sector continued to be dependent on crude oil, coal, and nuclear power (BP p.l.c., 2012, p. 41; EMED Mining Public Ltd., 2012a; European Wind Energy Association, 2012, p. 7–8).

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TABLE 1
SPAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2007	2008	2009	2010	2011 ^P
METALS					
Aluminum:					
Alumina ^{s,2}	1,500,000 ³	1,500,000	1,500,000	1,500,000	1,500,000
Metal:					
Primary	408,000 ³	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	6,508	7,067 ^r	12,587 ^r	46,333 ^{r,4}	74,246 ⁴
Metal:					
Blister:					
Primary	258,291	259,900	260,000	260,000	260,000
Secondary ^c	10,000	10,000	10,000	10,000	10,000
Total	268,291	269,900	270,000	270,000	270,000
Refined:^c					
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
Germanium oxide, Ge content ^c	5,000	5,000	5,000	5,000	5,000
Gold, mine output, Au content	3,500	3,400	3,400	3,400	3,400
Iron and steel, metal:					
Pig iron ^c	4,200	4,200	4,200	3,572 ^{r,4}	3,540 ⁴
Ferrous alloys, electric furnace ^c	180	180	180	180	180
Steel:					
Crude ⁵	19,000	18,600	14,400	16,343 ^{r,4}	15,591 ⁴
Hot rolled	15,000	15,000	15,000	15,000	15,000
Lead, metal, refined, secondary	128,000	125,000	125,000	125,000	125,000
Nickel, Ni content of concentrate	6,772	8,136	8,035	5,402 ^{r,4}	6,296 ⁴
Silver, mine output, Ag content	3,400	3,400	3,400	3,400	3,400
Zinc, metal, primary and secondary	494,090	456,050	500,776	505,000	489,000 ⁴
INDUSTRIAL MINERALS					
Barite, BaSO ₄	26,770	11,100	2,814	2,050 ^{r,4}	NA
Cement, hydraulic	54,720	42,088	29,505	26,217 ^r	20,700
Clays:					
Attapulgate ^c	20,000	20,000	20,000	20,000	20,000
Bentonite	147,253	154,534	140,000	157,001 ^{r,4}	110,721 ⁴
Kaolin, washed	489,428	355,739	300,000	310,993 ^{r,4}	302,580 ⁴
Other ^c	15,000	15,000	15,000	15,000	15,000
Diatomite and tripoli	50,000	50,000	29,194 ^{r,4}	64,346 ^{r,4}	50,000

See footnotes at end of table.

TABLE 1—Continued
 SPAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2007	2008	2009	2010	2011 ^p	
INDUSTRIAL MINERALS—Continued						
Feldspar	683,134	690,256	597,496 ^{r,4}	691,894 ^{r,4}	580,000	
Fluorspar, CaF ₂ content:						
Acid grade	132,760	127,300	111,810	126,730 ^{r,4}	109,284 ⁴	
Ceramic grade	14,474	15,930	6,485	1,824 ^{r,4}	2,639 ⁴	
Metallurgical grade	4,963	5,506	4,238 ^{r,4}	3,787 ^{r,4}	5,410 ⁴	
Total	152,197	148,736	122,533 ^{r,4}	132,341 ^{r,4}	117,333 ⁴	
Gypsum and anhydrite, crude ^c	thousand metric tons	15,000	15,000	11,500	6,990 ^{r,4}	7,100
Lime, hydrated and quicklime ^c	do.	2,000	2,000	2,000	2,200	2,200
Magnesite, calcined		196,776	187,626	163,930	195,893 ^{r,4}	200,000 ⁴
Mica		5,569	4,254	4,000	4,034 ^{r,4}	3,775 ⁴
Nitrogen, N content of ammonia	thousand metric tons	400	400	400	400	400
Pigment, mineral: ^c						
Ocher		140,000	140,000	140,000	140,000	140,000
Red iron oxide		1,500	1,500	1,500	1,500	1,500
Potash, K ₂ O equivalent ^c		435,000	435,000	481,455 ^{r,4}	418,778 ^{r,4}	436,026 ⁴
Pumice		600,000 ^e	600,000	436,542 ^{r,4}	432,364 ^{r,4}	430,500
Salt:						
Rock, including byproduct from potash works		2,850	2,850	2,850	3,116 ^{r,4}	3,200 ⁴
Marine and other	thousand metric tons	1,332	1,291	1,439 ^{r,4}	1,234 ^{r,4}	1,171 ⁴
Sand and gravel, silica sand ⁶	do.	134,000	134,000	134,000	170,000 ^{r,4}	130,000
Sand and gravel, industrial ^c	do.	5,000	5,000	5,000	5,000	5,000
Sepiolite, meerschaum		717,700	707,950	573,937 ^{r,4}	557,862 ^{r,4}	566,970 ⁴
Sodium compounds, n.e.s.. ^{c,7}						
Soda ash, manufactured	thousand metric tons	500	500	500	500	500
Sulfate, natural:						
Glauberite, Na ₂ SO ₄ content		9,500,000 ^e	9,500,000	1,121,784 ^{r,4}	1,216,787 ^{r,4}	1,200,000
Thenardite, Na ₂ SO ₄ content		165,000 ^e	165,000	166,362 ^{r,4}	156,776 ^{r,4}	160,000
Manufactured		125,000 ^e	125,000	125,000	125,000	125,000
Stone: ^c						
Chalk	thousand metric tons	1,000 ^e	1,000	744 ^{r,4}	679 ^{r,4}	700
Dolomite	do.	15,000 ^e	15,000	13,843 ^{r,4}	10,431 ^{r,4}	12,000
Limestone	do.	270,000 ^e	270,000	195,138 ^{r,4}	134,864 ^{r,4}	170,000
Marble, ornamental	do.	2,600 ^e	2,600	1,669 ^{r,4}	1,209 ^{r,4}	1,600
Marl	do.	10,000 ^e	10,000	9,000 ^{r,4}	8,057 ^{r,4}	8,000
Basalt	do.	5,000 ^e	5,000	2,703 ^{r,4}	2,252 ^{r,4}	3,000
Granite, ornamental	do.	12,500 ^e	12,500	20,964 ^{r,4}	12,464 ^{r,4}	12,500
Ophite	do.	4,000 ^e	4,000	5,181 ^{r,4}	3,446 ^{r,4}	4,000
Phonolite	do.	1,800 ^e	1,800	1,011 ^{r,4}	1,018 ^{r,4}	1,200
Porphyry	do.	1,100 ^e	1,100	2,682 ^{r,4}	1,548 ^{r,4}	1,550
Quartz	do.	1,100 ^e	1,100	789 ^{r,4}	1,129 ^{r,4}	1,100
Quartzite	do.	2,800 ^e	2,800	4,685 ^{r,4}	2,500 ^{r,4}	2,500
Sandstone	do.	3,400 ^e	3,400	2,905 ^{r,4}	2,219 ^{r,4}	2,400
Slate	do.	1,200 ^e	1,200	416 ^{r,4}	357 ^{r,4}	380
Other	do.	8,000 ^r	8,000 ^r	8,418 ^{r,4}	8,000 ^{r,4}	8,000
Strontium minerals, Sr ₂ O ₄ content		188,000 ^e	188,000	57,466 ^{r,4}	83,035 ^{r,4}	97,102 ⁴
Sulfur, byproduct: ^c						
Metallurgy	thousand metric tons	500	500	536	539	539
Petroleum	do.	100	100	100	100	100
Coal (lignite) gasification	do.	1	1	1	1	1
Total	do.	601	601	637	640	640
Talc and steatite		100,000 ^e	100,000	47,218 ^{r,4}	51,897 ^{r,4}	52,000

See footnotes at end of table.

TABLE 1—Continued
 SPAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2007	2008	2009	2010	2011 ^P	
MINERAL FUELS AND RELATED MATERIALS						
Coal, marketable:						
Anthracite	thousand metric tons	7,872	7,238	7,700	5,990 ^{r,4}	4,265 ⁴
Bituminous	do.	3,128	2,890	2,892	2,444 ^{r,4}	2,358 ⁴
Lignite	do.	6,180	--	--	--	--
Total	do.	17,180	10,128	10,592	8,434 ^{r,4}	6,623 ⁴
Coke, metallurgical ^e	do.	2,500	2,500	2,500	2,500	2,500
Gas, natural						
Produced	thousand cubic meters	41,741	46,354	32,280	58,425 ^{r,4}	43,888 ⁴
Marketed ^e	do.	330,000	330,000	330,000	330,000	330,000
Peat		60,000 ^e	60,000	58,678 ^{r,4}	64,962 ^{r,4}	65,000
Petroleum:						
Crude	thousand 42-gallon barrels	334	298	250	284 ^{r,4}	234 ⁴
Refinery products:						
Liquefied petroleum gas	do.	34,104	34,240	34,200	34,200	34,200
Naphtha ^e	do.	25,300	25,401	25,400	25,400	25,400
Gasoline, motor	do.	88,651	89,006	89,000	89,000	89,000
Jet fuel	do.	21,454	21,540	21,500	21,500	21,500
Kerosene	do.	16,192	16,257	16,300	16,300	16,300
Distillate fuel oil	do.	113,319	113,740	114,000	114,000	114,000
Residual fuel oil	do.	57,988	58,220	58,200	58,200	58,200
Other	do.	80,960	81,284	81,300	81,300	81,300
Refinery fuel and losses	do.	26,312	26,417	26,400	26,400	26,400
Total	do.	464,280	466,105	466,300	466,300 ^r	466,000

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to total shown. ^PPreliminary. ^rRevised. -- Zero.

¹Table includes data available through July 31, 2012.

²Reflects aluminum hydrate.

³Reported data. Source: Alcoa Inc. 2011 Annual Report.

⁴Reported figure. Source: Minerals Questionnaire 2010 and 2011.

⁵Reported data. Source: Worldsteel Association, January 21, 2012.

⁶Includes sand obtained as a byproduct of feldspar and kaolin production.

⁷Not 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 2011

(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. (AESA) (Alcoa Inc., 100%)	Alumina plant at San Ciprian, Lugo	1,450
Aluminum	do.	Electrolytic plant at San Ciprian, Lugo	250
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, Almeria	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 Lucia Mine, Leon	2,000
Do.	Minas de Figaredo S.A.	Mines near Oviedo	1,000
Do.	Nacional de Carbon del Sur (Encasur)	Rampa 3 and San Jose 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 McMoRan 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 McMoRan Copper & Gold Inc., 100%)	Mines and plant at Ariertero near Santiago de Compostela	12
Do.	do.	Alfredo underground mine in Rio Tinto area	30
Do.	Inmet Mining Corp., 100%	Open pit mines in Seville, Andalucia, Spain	210
Do.	do.	Cathode electrowinning at Las Cruces in Seville	72
Do.	Minas de Rio Tinto S.A.	Cerro Colorado open pit mine	20
Do.	Rio Narcea Gold Mines, Ltd. (Lundin Mining Corp., 100%)	Aguablanca Mine, Extremadura	7
Dunite	Pasek España S.A.	Mines and plant at Landoy, Ortigueira	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	Rio Narcea Gold Mines, Ltd.	El Valle and Carles 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	Rio 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 2011

(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	37,000
Do.	do.	do.	Refinery at Tenerife	35,000
Do.	do.	Petroleos 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 Iberica 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
Do.		Rio Tinto Minera S.A. (Rio Tinto plc, 75%, and Rio Tinto Zinc, 25%)	Mines and plant at Rio Tinto (closed 2001)	900
Sepiolite		Grupo Tolsa S.A.	Mine and plant at Vicalvaro near Madrid	1,000
Do.		Silicatos-Anglo-Ingleses S.A.	Mine and plant at Vilecas 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 Montevives, 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	500
Do.		Española del Zinc S.A.	Electrolytic plant at Cartagena	50
Do.		Asturiana de Zinc S.A. (Xstrata plc, 100%)	Reocin mines and plants (closed 2003)	500
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 Agustin	200

Do., do. Ditto.