



2013 Minerals Yearbook

SPAIN

THE MINERAL INDUSTRY OF SPAIN

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In 2013, Spain was ranked 16th among the world's leading producers of crude steel, accounting for about 8% of world production. The country's mineral industry was dominated by industrial minerals, such as common clay, granite, gypsum, fluorspar, limestone, salt (marine and rock), and sand and gravel (industrial). Metals produced in the country included copper, gold, iron, lead, nickel, silver, tungsten, and zinc. Spain also produced cement and mineral fuels, such as coal, crude petroleum, natural gas, and petroleum refinery products (table 1; World Steel Association, 2014).

Spain encompasses almost 90% of the Iberian Peninsula, which includes the volcanogenic 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 (Gibbons and Moreno, 2002, p. 473–510; Bastida and others, 2010, p. 597–622; Calvo and Pardo, 2012).

Spain has a long history of mining and has attracted significant foreign investment, which can be attributed to the highly prospective geology of the IPB and the Rio Narcea Belt. International mineral investment interest has also been encouraged by Spain's well-developed infrastructure, the availability of a skilled workforce, its long mining tradition and past success in exploration and mine development, and the availability of financial incentives and tax benefits for activities carried out in certain industries, including mining. Financial incentives include interest relief on loans obtained by companies seeking to develop mining projects (Industrial Minerals, 2013).

Minerals in the National Economy

In 2013, Spain's real gross domestic product (GDP) decreased by 1.2% compared with that of 2012. Spain's industrial sector, which included energy, manufacturing, and mining and quarrying, accounted for about 16% of the country's GDP. According to the Instituto Nacional de Estadística, in 2013, 105 enterprises were engaged in the mining of coal, 67 in the mining of metal ores, 18 in the extraction of crude petroleum and natural gas, and 2,327 in other mining and quarrying activities. In the fourth quarter of 2013, about 31,800 were employed in the mining and quarrying sector compared with about 35,200 in the fourth quarter of 2012 (Banco de España, 2014, p. 1; International Monetary Fund, 2014, p. 50; Instituto Nacional de Estadística, 2015a, p. 317; 2015b–c, e).

Government Policies and Programs

Spain's mineral and energy industries are regulated by the Mining Law of July 21, 1973, and the Hydrocarbon Law of October 7, 1998, respectively. The Ministerio de Industria, Energía y Turismo (MIET) was created by the Royal Decree of February 10, 2012, and is responsible for proposing and implementing Government policies on energy, telecommunication, tourism, and industrial development. The Secretaria de Estado de Energía, which is a subunit of the MIET, is responsible for the development of energy and mining policy. The Instituto Geológico y Minero de España (IGME), which is a subunit of the Ministerio de Economía y Competitividad, is the principal Government mineral-resource agency. IGME was created by the Royal Decree of July 12, 1849. IGME is responsible for the research of mineral raw materials by studying and characterizing rocks and mineral deposits of potential economic interest. IGME also contributes to environmental mine planning, recovery, and remediation. Sociedad Estatal de Participaciones Industriales (SEPI), which is a Government-owned holding company that has mining as one sector in its portfolio, was created by Law 20 of June 5, 2006. In the mineral sector, SEPI owned 100% of Hulleras del Norte, S.A. (HUNOSA), a coal producer; 60% of Enusa Industrias Avanzadas, S.A. (ENUSA), a nuclear energy producer; 20% of Red Eléctrica Corporación, S.A. (RECSA), an electricity producer; and 5% of Enagás, S.A. (ENAGAS), a natural gas producer (Instituto Geológico y Minero de España, 2013; Ministerio de Industria, Energía y Turismo, 2014b; Sociedad Estatal de Participaciones Industriales, 2014, p. 12–13).

Production

In 2013, nickel production increased by 216% to 7,574 metric tons (t); crude petroleum production increased by 156% to 2.73 million barrels (Mbbbl); metallurgical-grade fluorspar, by 92% to 4,320 t; peat, by 50% to 91,806 t; thenardite sodium compounds, by 33% to 234,353 t; and pig iron, by 28% to 3.9 million metric tons (Mt). The production of silver increased by 24% to 5,400 kilograms (kg); gold, by 22% to 1,870 kg; bentonite, by 17% to 112,887 t; ferrosilicon, by 17% to 80,500 t; feldspar, by 14% to 602,908 t; and potash, by 13% to 711,272 t. In 2013, production of lubricants increased by 16% to 1.34 Mbbbl, and that of petroleum coke, by 11% to 18.93 Mbbbl (table 1).

Secondary blister copper production decreased by 51% to 12,300 t (estimated) in 2013; anthracite coal, by 35% to 2.5 Mt; porphyry copper, by 27% to 1.1 Mt; ceramic-grade fluorspar, by 24% to 5,056 t; secondary refined copper, by 23% to 68,000 t (estimated); primary blister copper, by 21% to 212,000 t (estimated); marble, by 21% to 1.4 Mt; bituminous coal, by 20% to 1.8 Mt; marl, by 20% to 4.5 Mt; hydraulic cement, by 14% to 13.7 Mt; primary refined copper, by 15% to 214,000 t (estimated); basalt by 13% to 1.1 Mt; acid-grade fluorspar, by

13% to 86,115; diatomite and tripoli, by 12% to 53,713 t; and silicon metal, by 11% to 24,200 t (estimated) (table 1).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2013, the total value of Spain's exports was about \$322.4 billion¹ compared with a revised \$294.2 billion in 2012. The total value of Spain's imports was about \$344.4 billion compared with a revised \$334.9 billion in 2012. Petroleum and derivatives accounted for about 6.0% of total exports and about 18.0% of total imports; iron and steel, 3.5% of total exports and 2.6% of total imports; nonferrous metals, 1.9% of total exports and 1.3% of total imports; and minerals, 1.4% of total exports and 2.6% of total imports. In 2013, the European Union member countries received about 62.6% of the country's exports and supplied about 51.5% of the country's imports. The country's major export trade partners were, in descending order of value, France (which received 16.1% of Spain's exports), Germany (10.1%), Portugal (7.5%), Italy (7.0%), the United Kingdom (6.8%), and the United States (3.7%). Its major import trade partners were, in descending order of value, Germany (which supplied 11.1% of Spain's imports), France (10.9%), China (6.9%), Italy (4.1%), the United States (4.0%), Portugal (3.9%), the United Kingdom (3.9%), and Algeria (3.6%). In 2013, Spain imported about 431 Mbbl of crude oil (reported as 58 Mt) compared with about 438 Mbbl (reported as 59 Mt) in 2012. Mexico supplied 15% of Spain's crude oil, followed by Saudi Arabia and Nigeria, 14% each; and Russia, 13% (Ministerio de Economía y Competividad, 2014, 61, 72, 85; Ministerio de Industria, Energía y Turismo, 2014a; Instituto Nacional de Estadística, 2015d).

Spain's exports to the United States were valued at \$11.7 billion in 2013 compared with \$11.8 billion in 2012. Of this amount, petroleum products accounted for \$1.6 billion; iron and steel products, \$211.7 million; drilling and oilfield equipment, \$60.2 million; coal and related fuels, \$18.9 million; nonmonetary gold, \$13.2 million; nonferrous metals, \$13.2 million; liquefied petroleum gas, \$4.5 million; and zinc, \$1.0 million. Imports from the United States were valued at \$10.2 billion in 2013 compared with \$9.5 billion in 2012; these included \$582.5 million in fuel oil, \$175.6 million in petroleum products, \$138.0 million in nonferrous metals, \$111.2 million in drilling and oilfield equipment, \$55.7 million in copper, \$47.6 million in iron and steel mill products, \$29.6 million in natural gas liquids, and \$5.9 million in alumina and aluminum (U.S. Census Bureau, 2014a, b).

¹Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US\$) at an average rate of EUR0.76=US\$1.00 for 2012 and EUR0.73=US\$1.00 for 2013.

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—Alumina Española S.A., which was a joint venture between Alcoa Inc. of the United States (60%) and Alumina Ltd. of Australia (40%), owned and operated the San Ciprian alumina refinery, which had a production capacity of about 1.5 million metric tons per year (Mt/yr) of aluminum oxide. Bauxite for the facility was supplied mainly by Alcoa's mines in Brazil and Guinea. The production of alumina (aluminum oxide) was used for the production of primary aluminum and chemical aluminum oxides for the ceramics and chemical sectors (Alcoa Inc., 2014b; Alumina Ltd., 2014).

Alcoa Inespal S.A., which was a subsidiary of Alcoa, was the only producer of aluminum in the country. Alcoa Inespal operated the Aviles smelter, which had a production capacity of about 93,000 metric tons per year (t/yr); La Coruña smelter, which had a production capacity of about 87,000 t/yr; and the San Ciprian smelter, which had a production capacity of about 228,000 t/yr. In 2012, Alcoa announced its intentions to temporarily reduce its production capacity at Aviles to 46,000 t/yr and La Coruña to 44,000 t/yr. The decision to reduce capacity was attributed to the high operational costs, the increase in raw material costs, and low aluminum prices. In 2013, Alcoa resumed some production (27,000 t/yr combined) that had been temporarily reduced at Aviles and La Coruña in 2012 (Alcoa Inc., 2014a, p. 13, 62).

Copper, Gold, Lead, Silver, and Zinc.—First Quantum Minerals Ltd. (FQM) of Canada owned and operated Las Cruces copper mine through its 100%-owned subsidiary Cobre Las Cruces S.A. The mine, which was located on the eastern edge of the IPB about 20 km northwest of the city of Seville, had an estimated mine life of 9 years. As of December 2012, Las Cruces had estimated proven and probable copper reserves of 14.1 Mt grading 5.44% copper. Las Cruces had a designed production capacity of about 72,000 t/yr of copper cathode. In 2013, copper cathode production was 69,304 t compared with 67,662 t in 2012. Las Cruces was expected to produce between 69,000 t and 72,000 t of copper cathode in 2014. In March, FQM acquired Inmet Mining Corp. of Canada, which was the former owner of Las Cruces Mine (First Quantum Minerals Ltd., 2013a, p. 8, 14–15; 2013b; 2014a; 2014b, p. 4).

Orvana Minerals Corp. (OMC) of Canada, through its wholly owned subsidiary Kinbauri España S.L.U. (Kinbauri), owned and operated the El Valle-Boinas and Carles (EVBC) underground gold-copper-silver mines in the Rio Narcea gold belt in northern Spain. In 2013, silver production from the EVBC mines was 5,351 kg compared with 3,976 kg in 2012, and gold production was about 1,870 kg compared with 1,393 kg in 2012. Copper production from the EVBC mines was 2,979 t in 2013 compared with 2,073 t in 2012. The recovery of a failed stope in the San Martin skarns area within the Boinas Mine, which took place in 2012, was underway and was expected to be completed in early 2014. The company expected to ensure ground stability to access ores from other nearby stopes and to provide access to higher grade ores. After an incident in June, which resulted in material damage to the

hoist and shaft system at Boinas, reconstruction work was underway and was expected to be completed in early 2014. As of June 2013, proven and probable reserves at the EVBC mines were estimated to be 7.7 Mt at average grades of 9.82 grams per metric ton (g/t) silver, 3.53 g/t gold, and 0.47% copper. Total measured and indicated mineral resources were estimated to be 8.8 Mt at average grades of 12.66 g/t silver, 4.44 g/t gold, and 0.60% copper, and inferred mineral resources were estimated to be 8.3 Mt at average grades of 4.80 g/t silver, 4.66 g/t gold, and 0.34% copper. OMC planned to update the estimates of the reserves and mineral resources and to continue exploration work at the EVBC mines in 2014. The company also expected to produce between 5,000 and 5,700 kg of silver, between 1,800 and 2,100 kg of gold, and between 2,700 and 3,000 t of copper in 2014 (Orvana Minerals Corp., 2013a, p. 9; 2013b, p. 7; 2014, p. 1, 5–7, 11).

By yearend 2013, the Government of Andalucía granted Cambridge Minería España SL, which was a subsidiary of Cambridge Mineral Resources Plc. of the United Kingdom, an exploration permit for the Masa Valverde deposit. The permit covered an area of about 14 square kilometers over the Masa Valverde polymetallic VMS deposit, which is located in the central part of the IPB in southwestern Spain. The company also announced a joint-venture agreement with Glencore plc of Switzerland. Exploration work was underway to define mineral resources at Masa Valverde (Cambridge Mineral Resources Plc., 2013; 2014a, p. 3; 2014b).

Petaquilla Minerals Ltd. of Canada held 100% interest in the Lomero-Poyatos project, through its subsidiary Petaquilla España S.L. The project was located in the Andalucía Region in the northeast part of the IPB and was acquired by Petaquilla Minerals through the acquisition of Iberian Resources Corp. in 2012. In February, the company completed a drilling program at Lomero-Poyatos and expected to update the estimates of measured and indicated mineral resources by 2015. In May, Petaquilla Minerals announced the construction of a mine-access ramp at Lomero-Poyatos, which would be used for bulk sampling. As of 2012, inferred mineral resources were estimated to be 6.07 Mt at an average grade of 4.25 g/t gold and 88.7 g/t silver (Petaquilla Minerals Ltd., 2013; 2014a, b).

Trafigura Beheer B.V. of the Netherlands, through its subsidiary Minas de Aguas Teñidas S.A.U. (MATSA), owned and operated Aguas Teñidas Mine and treatment plant, which is located in Almonaster la Real, Hueva. In April, MATSA announced an expansion project at its Aguas Teñidas plant at a cost of about \$411 million, which would increase the Aguas Teñidas's processing capacity to 4.4 Mt/yr from 2.2 Mt/yr. The expansion was expected to be completed by 2015 and to increase the project life for about 15 years. The plant processed copper, lead, and zinc concentrates, which were then exported to Brazil, China, Mexico, and northern Europe (Minas de Aguas Teñidas S.A.U., 2013a, b; 2014).

Nickel.—Lundin Mining Corp. of Canada, through its subsidiary Rio Narcea Recursos. S.A., owned the Aguablanca nickel and copper mine, which is located about 100 km north of Seville in Extremadura Region. In 2013, nickel and copper production from the Aguablanca Mine was 7,574 t and 6,242 t, respectively. As of December, measured and indicated mineral

resources at Aguablanca were estimated to be 7.2 Mt at average grades of 0.7% nickel and 0.6% copper and 243,000 t at average grades of 0.5% nickel and 0.2% copper, respectively. Aguablanca's total reserves were estimated to be 5.4 Mt at average grades of 0.6% nickel and 0.5% copper. In the third quarter of 2012, mine instabilities reoccurred in the south wall of the open pit mine and, in 2013, significant efforts were made to stabilize the south wall, including slope reinforcement and increased drainage. Production at the Aguablanca open pit was expected to continue until the first quarter of 2015 when the pit would reach the 186-meter (m) level. Lundin Mining planned to begin the development of Aguablanca's underground mine by mid-2014 (Lundin Mining Corp., 2014a, p. 32; 2014b, c).

Tungsten.—Almonty Industries Inc. of Canada, through its subsidiary Daytal Resources Spain S.L., owned and operated Los Santos tungsten project. Los Santos project included the Capa Este, Las Cortinas East, and the Santos Sur open pit mines and a processing plant, which had the capacity to process about 400,000 t/yr. The project, which is located about 50 km south of the city of Salamanca in western Spain, produced tungsten concentrates. In October, a technical report on the mineral resources and reserves was completed, and total measured and indicated mineral resources were estimated to be about 2.8 Mt at an average grade of 0.32% WO₃ (tungsten trioxide) at a cutoff grade of 0.05% WO₃. Inferred mineral resources were estimated to be about 1.5 Mt at an average grade of 0.24% WO₃ at a cutoff grade of 0.05% WO₃. Proven and probable reserves were estimated to be 1.9 Mt at an average grade of 0.39% WO₃. The technical report suggested the extension of the mine life by an additional 9 years. The company planned to conduct additional exploration activities in identified areas in 2014, which would target the underground potential of Los Santos project (Wheeler, 2013, p. 11–12, 16, 44).

In March, Almonty entered into an option agreement to acquire a 51% interest and to be the project operator of the Valtreixal tin-tungsten project, which is located in northwestern Spain about 250 km from Los Santos. The agreement included the option to acquire the remaining 49% interest after 24 months. The company planned to conduct exploration work on the property and to complete a technical report during the 24-month option period (Almonty Industries Inc., 2014, p. 7, 18–19).

Ormonde Mining plc of Ireland, through its subsidiary Saloro SLU, held a 100% interest in the Barruecopardo tungsten project located in the Salamanca Province, Castilla y Leon Region. In 2012, the company completed a feasibility study for the Barruecopardo project, which had the potential to be developed as an open pit mine and to produce about 227,000 t/yr of WO₃ during the first 9 years of operation. Ormonde Mining expected the approval of the Barruecopardo's environmental impact declaration from the Salamanca Provincial Authorities of the Region of the Castilla y Leon in early 2014. The company also expected to sign an offtake agreement with Noble Group of Singapore in 2014, which would include the sale of the entire Barruecopardo tungsten concentrate production to Noble Group plc for the initial 5 years of operation (Ormonde Mining plc, 2013; 2014a, p. 4–6; 2014b, c).

Industrial Minerals

Cement.—At least 10 companies were engaged in the production of cement in Spain, which included Grupo Alfonso Gallardo through its subsidiary A.G. Cementos Balboa S.A.; Votorantim Group of Brazil through its subsidiary Cementos Cosmos S.A.; Cementos Mexicanos S.A.B. de C.V. of Mexico (CEMEX) through its subsidiary CEMEX España Operaciones, S.L.U.; CRH plc of Ireland through its subsidiary Cementos Lemona S.A.; Cementos Molins, S.A. through its subsidiary Cementos Molins Industrial, S.A.U.; Cementos Portland Valderrivas Group through its subsidiary Cementos Portland Valderrivas, S.A.; Corporación Masaveu (Cementos Tudela Veguín, S.A.); Holcim Ltd. of Switzerland (Holcim (España) S.A.); Lafarge Cementos S.A. of France; and Italcementi Group of Italy (Sociedad Financiera, S.A.). These companies have a combined cement production capacity of 35.3 Mt/yr (table 2).

According to the Agrupacion de Fabricantes de Cemento de España (Oficemen), domestic cement consumption decreased by 21% in 2013, bringing the national cement consumption to about 10.7 Mt compared with about 13.6 Mt in 2012. The decrease in consumption was a result of the recession within the construction industry and the reduction of public investments in the country. In 2013, cement plants operated at about 40% of their installed production capacity. During the year, high energy costs, owing to the high cost of fuels, were also a challenge for the cement industry in the country. The cement industry was exploring the use of residues for fuel in cement production, such as used tires, plastics, used oils, and oil residues. In 2013, about 26% of the thermal energy consumed by the cement industry was obtained using residues (Oficemen, 2013a, b; 2014a, p. 78; 2014b, p. 4–5; 2014c).

In 2013, Spain's cement and clinker exports increased by 13.2% to about 7.0 Mt (3.0 Mt of cement and 3.9 Mt of clinker) compared with about 6.2 Mt (2.7 Mt of cement and 3.5 Mt of clinker) in 2012. In 2013, Africa received about 4.3 Mt, or 23.6%, of the country's cement and clinker exports, followed by the countries of the European Union, which received about 1.6 Mt, or 13.6%. Spain imported 405,624 t of cement and clinker (299,454 t of cement and 106,170 t of clinker) in 2013 compared with 523,973 t (380,412 t of cement and 143,561 t of clinker) in 2012. The countries of the European Union supplied 60% of the cement and clinker imports (Oficemen, 2014a, p. 78–83).

Potash.—Iberpotash S.A. of Israel, through its subsidiary Chemicals Ltd., was the only producer of potassium salts in Spain. The company operated the Cabanasses Mine in Suria and the Vilafruns Mine in Balsareny and employed about 1,205 people in 2013. Iberpotash exported about 75% of its production to Asia, Europe, North Africa, and South America. During the year, the company began its expansion plan at Suria to ensure the increase in production and productivity, at an initial cost of about \$220 million. The expansion plan included the construction of a new vacuum salt plant with a production capacity of about 750,000 t/yr at 99.7% purity and a 5-km access ramp. In October, the company began the construction of the access ramp, which would allow the

direct transportation of about 1,500 metric tons per hour from the Cabanasses underground mine to the treatment plant and was expected to be completed by 2014. Potash production was expected to increase by 250,000 t/yr (Lara, 2013; La Vanguardia.com, 2013; Iberpotash S.A., 2014a–c).

Mineral Fuels and Related Materials

Coal.—Coal was produced mainly in the areas of Aragon, Asturias, Castilla-La Mancha, and Castilla y Leon. Private companies produced most of the coal in the country, although the leading producer of bituminous coal was the HUNOSA. In 2013, about 15 companies were engaged in the extraction of coal, and they employed 5,309 people. In 2013, estimated proved reserves of anthracite and bituminous coal amounted to 200 Mt and proved reserves of subbituminous coal and lignite amounted to 330 Mt, for a total of 530 Mt. In 2013, Spain's coal consumption decreased by 31.5% to 10.3 Mt compared with 15.1 Mt in 2012. In October, a framework plan for coal mines and mining communities for 2013–18 (the Marco de Actuacion para la Minería de Carbon y las Comarcas Mineras en el period 2013–2018) was signed by MIET, the Federacion de Industria de CCOO y Uso, the Federacion de Industria y de los Trabajadores Agrarios de la Union General de Trabajadores (Fitag-UGT), and the Federacion Nacional de Empresarios de Minas de Carbon (Carbunion). The framework included the decrease of coal production to about 5.8 Mt/yr and the reduction of the coal mining workforce by 15% by 2018 (Ministerio de Industria, Energia y Turismo, 2013, p. 15–16; Poblacionpress, 2013; BP p.l.c., 2014, p. 30).

Natural Gas.—Spain's natural gas production was about 61.4 million cubic meters compared with 64.7 million cubic meters in 2012. Proven reserves were estimated to be 25 billion cubic meters. In 2013, natural gas imports by pipeline increased by 15% to about 15.3 billion cubic meters compared with 13.3 billion cubic meters in 2012, and liquefied natural gas imports decreased by 27% to 14.9 billion cubic meters compared with 20.4 billion cubic meters in 2012. Algeria was Spain's major supplier of natural gas, mainly through the Maghreb-Europe gas pipeline, which began operation in 2011 (BP p.l.c., 2014, p. 23, 28–29; U.S. Energy Information Administration, 2014).

In April, the MIET approved the extension of the Sirocco exploration permit for gas exploration in the seabed off the coast of Malaga. Sirocco was a joint venture between Repsol (which was the operator and held 60% interest) and Gas Natural Fenosa (40%). Exploration work included one exploration well and production tests, which are expected to be completed by mid-2015 (Repsol S.A., 2013a, p. 42).

Petroleum.—The country's proven reserves of crude oil were estimated to be 150 Mbbbl. Repsol YPF S.A. operated two offshore oilfields—Lubina, in which the company held 100% interest, and Montanazo, in which the company held a 68.67% interest. The Lubina and the Montanazo oilfields had an estimated combined production capacity of about 5,000 barrels per day (bbl/d). Both oilfields are located about 45 km from the coast of Tarragona Province and began operation in 2012. In 2013, oil production at the two oilfields was about 2 Mbbbl.

Reserves from the fields were routed through the Casablanca platform and sent as crude oil through a 43-km pipeline to Repsol's refinery in Tarragona Province. (Repsol S.A., 2009; 2013a, p. 42; U.S. Energy Information Administration, 2014).

Repsol also held 100% interest in four refineries located in the Provinces of La Coruña, Ciudad Real, Murcia, and Tarragona with a combined capacity of about 676,000 bbl/d. Repsol, through its subsidiary Refinería de Petroleos del Norte S.A (Petronor), also held 85.98% interest in the Bilbao refinery located at Muskiz. In April, Repsol announced the inauguration of a new unit at the Bilbao refinery, which increased its production capacity to about 245,000 bbl/d from about 220,000 bbl/d and would generate about 100 new direct jobs. The new unit would reduce the refinery's fuel oil production and would increase output of higher demand products, such as butane, diesel, gasoline, and propane. The unit would also reduce carbon dioxide emissions by about 440,000 t/yr and would save about 99,000 t/yr of fuel (Repsol S.A., 2013a, p. 12; 2013b).

Uranium.—Berkeley Resources Ltd. of Australia, through its wholly owned subsidiary Berkeley España S.A., owned a 100% interest in the Salamanca project, which included the Alameda, the Gambuta, and the Retortillo deposits. As of September, total indicated and inferred mineral resources at Alameda and Retortillo were estimated to be 36.9 Mt at an average grade of 424 parts per million (ppm) uranium oxide (U_3O_8) at a cutoff grade of 200 ppm U_3O_8 . A prefeasibility study for the Alameda and the Retortillo deposits was completed in September. The study reported that the project had the potential to be developed as an open pit mine and to produce an average of about 1,225 t/yr of U_3O_8 during the initial 11 years. In October, the government of Castilla and Leon approved an environmental license for Retortillo, and the company expected to receive approval for a mining license in the second quarter of 2014. Berkeley Resources expected to complete a definitive feasibility study for the Alameda and the Retortillo deposits by the end of 2014. By yearend, the company completed a scoping study for the Gambuta deposit, which had estimated inferred mineral resources of 12.7 Mt at an average grade of 394 ppm U_3O_8 at a cutoff grade of 200 ppm U_3O_8 . The company planned to incorporate the Gambuta deposit with the Alameda and the Retortillo deposits and potentially increase the project's production scale and (or) mine life (Berkeley Resources Ltd., 2014, p. 4–8).

Outlook

Spain is expected to show an increase in GDP of 1.4% for 2014 (International Monetary Fund, 2015, p. 51). The IPB is likely to continue to be of interest to domestic and foreign mining companies and is a prime target for mineral exploration because of previous discoveries of large VMS deposits. Spain's output of mineral fuels is not sufficient to satisfy domestic demand and the country is likely to continue to be a large-scale importer of petroleum and natural gas. Owing to the country's strong dependence on imported energy sources, the Government is expected to support investments in renewable energy, such as biofuels, geothermal, solar, and wind. Spain has adopted a national renewable energy action plan, in accordance with

the European Union renewable energy directive, in which renewable sources must account for at least 20% of its final energy consumption and a contribution of 10% to transportation by 2020. Nevertheless, Spain's current power sector is likely to continue to be dependent on coal, crude oil, and nuclear power in the short run. In the long run, plans to develop crude oil, natural gas, and uranium deposits are expected to strengthen the mineral fuel sector. Expansion plans at the Aguas Teñidas, EVBC, Los Santos, and Cabanasses Mines and plans to develop the Masa Valverde and Lomero-Poyatos deposits are likely to attract foreign investment and increase interest in the mineral sector (Ministerio de Industria, Turismo y Comercio, 2010, p. 5).

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TABLE 1
SPAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ^{2,3}	2009	2010	2011	2012	2013 ^c	
METALS						
Aluminum:^c						
Alumina	1,500,000	1,500,000	1,500,000	1,500,000	1,400,000	
Metal, primary	360,307 ^{r,4}	340,000 ^r	365,000 ^r	230,000 ^r	245,000	
Copper:						
Mine output, Cu content	23,058 ^r	50,830 ^r	75,057 ^r	99,884 ^r	100,000	
Metal:^c						
Blister:						
Primary	263,000 ^r	236,000 ^r	231,000 ^r	270,000 ^r	212,000	
Secondary	6,000 ^r	19,000 ^r	21,700 ^r	25,000 ^r	12,300	
Total	269,000 ^r	255,000 ^r	253,000 ^r	295,000 ^r	224,000	
Refined:						
Primary	250,000 ^r	236,000 ^r	226,000 ^r	251,000 ^r	214,000	
Secondary	73,000 ^r	83,000 ^r	86,000 ^r	88,000 ^r	68,000	
Total	323,000 ^r	319,000 ^r	312,000 ^r	339,000 ^r	282,000	
Gold, mine output, Au content						
	kilograms	-- ^r	-- ^r	529 ^r	1,529 ^r	1,870 ⁴
Iron and steel, metal:⁵						
Pig iron	thousand metric tons	2,920 ^r	3,572	3,540	3,081 ^r	3,949
Crude steel	do.	14,400	16,343	15,504 ^r	13,639 ^r	13,740
Ferrous alloys, electric furnace:^c						
Ferrosilicon		53,300	76,300	69,700	68,600	80,500
Silicon metal		22,500	31,500	34,800	27,200	24,200
Lead:						
Mine output, Pb content		52	379	7,813	3,763	4,000
Metal, refined, secondary ^c		138,000 ^r	165,000 ^r	177,000 ^r	160,000 ^r	157,000
Nickel, Ni content of concentrate		8,035	5,402	-- ^r	2,397 ^r	7,574 ⁴
Silver, mine output, Ag content	kilograms	-- ^r	-- ^r	1,505 ^r	4,363 ^r	5,400
Tungsten, mine output, W content		225 ^r	240 ^r	497 ⁶	542 ^{r,6}	510 ⁶
Zinc:						
Mine output, Zn content		--	17,358	33,199	28,634	29,000
Metal, primary and secondary ^c		515,000 ^r	515,000 ^r	524,000 ^r	521,000 ^r	521,000
INDUSTRIAL MINERALS						
Barite, BaSO ₄ content		5,000 ^r	2,000 ^r	-- ^r	-- ^r	--
Cement, hydraulic	thousand metric tons	29,505	26,217	22,178 ^r	15,939 ^r	13,700 ⁴
Clays:						
Attapulgit		21,110	27,841	26,021	23,537 ^r	25,439 ⁴
Bentonite		147,000 ^r	157,001	110,731 ^r	96,605 ^r	112,887 ⁴
Common	thousand metric tons	13,295	12,185	9,940	8,240	8,200
Kaolin, crude and washed		150,000 ^r	184,000 ^r	195,000 ^r	247,000 ^r	247,000
Refractory		71,000	117,000	139,000	78,000	78,000
Sepiolite		573,937	557,862	566,270 ^r	622,000 ^r	622,000
Diatomite and tripoli		29,194	64,346	54,000 ^r	60,777 ^r	53,713 ⁴
Feldspar		597,496	691,894	662,418 ^r	530,238 ^r	602,908 ⁴
Fluorspar, CaF₂ content:						
Acid-grade		108,456 ^r	123,562 ^r	106,294 ^r	98,374 ^r	86,115 ⁴
Ceramic-grade		4,277 ^r	1,213 ^r	1,599 ^r	6,699 ^r	5,056 ⁴
Metallurgical-grade		3,157 ^r	2,873 ^r	4,275 ^r	2,250 ^r	4,320 ⁴
Total		115,890 ^r	127,648 ^r	112,168 ^r	107,323 ^r	95,491 ⁴
Gypsum and anhydrite, crude	thousand metric tons	8,181 ^r	6,990	7,825 ^r	6,360 ^r	7,125 ⁴
Magnesite, crude		165,197 ^r	195,893 ^r	239,131 ^r	274,551 ^r	275,000
Mica		3,665 ^r	4,034	3,609 ^r	3,518 ^r	3,462 ⁴
Peat ⁷		58,678	64,962	86,571 ^r	61,379 ^r	91,806 ⁴
Potash, K ₂ O equivalent		481,455	514,222 ^r	520,555 ^r	632,477 ^r	711,272 ⁴
Pumice		436,542	432,364	303,462 ^r	194,655 ^r	195,000
Salt:						
Rock	thousand metric tons	2,763 ^r	3,116	3,096 ^r	2,786 ^r	2,902 ⁴
Marine and other	do.	1,439	1,334 ^r	1,407 ^r	1,323 ^r	1,376 ⁴

See footnotes at end of table.

TABLE 1—Continued
 SPAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ^{2,3}	2009	2010	2011	2012	2013 ^c
INDUSTRIAL MINERALS—Continued					
Sand and gravel, silica sand ⁸ thousand metric tons	4,965 ^r	5,057 ^r	5,073 ^r	3,416 ^r	3,400
Sodium compounds, n.e.s., sulfate, natural: ⁹					
Glauberite, Na ₂ SO ₄ content	1,057,000 ^r	1,146,000 ^r	1,049,000 ^r	1,276,130 ^r	1,329,514 ⁴
Thenardite, Na ₂ SO ₄ content	143,000 ^r	135,000 ^r	107,000 ^r	175,726 ^r	234,353 ⁴
Stone:					
Basalt thousand metric tons	2,703	2,352 ^r	1,919 ^r	1,281 ^r	1,118 ⁴
Chalk do.	743 ^r	796 ^r	665 ^r	645 ^r	640
Dolomite do.	13,843	13,210 ^r	10,942 ^r	6,926 ^r	6,900
Granite, ornamental do.	20,964	17,208 ^r	14,066 ^r	10,032 ^r	9,200 ⁴
Limestone do.	195,138	160,920 ^r	129,610 ^r	89,332 ^r	89,300
Marble, ornamental do.	1,669	1,452 ^r	2,104 ^r	1,754 ^r	1,382 ⁴
Marl do.	9,000	8,316 ^r	5,937 ^r	5,581 ^r	4,486 ⁴
Ophite do.	5,181	3,658 ^r	2,398 ^r	1,520 ^r	1,425 ⁴
Phonolite do.	1,011	1,018 ^r	612 ^r	619 ^r	620
Porphyry do.	2,682	2,028 ^r	2,095 ^r	1,468 ^r	1,073 ⁴
Quartz do.	725 ^r	1,032 ^r	892 ^r	1,023 ^r	949 ⁴
Quartzite do.	4,685	3,017 ^r	3,018 ^r	2,082 ^r	2,058 ⁴
Sandstone do.	2,905	2,485 ^r	2,072 ^r	1,382 ^r	1,385 ⁴
Slate do.	416	365 ^r	416 ^r	336 ^r	377 ⁴
Strontium minerals, celestite	52,000 ^r	75,000 ^r	87,000 ^r	87,000 ^r	87,000
Talc and steatite	47,218	51,897	12,000 ^r	8,857 ^r	9,000
MINERAL FUELS AND RELATED MATERIALS					
Coal, marketable:					
Anthracite thousand metric tons	6,954 ^r	5,990	4,265	3,910 ^r	2,543 ⁴
Bituminous do.	2,494 ^r	2,444	2,358	2,275 ^r	1,827 ⁴
Total do.	9,448 ^r	8,434	6,623	6,185 ^r	4,370 ⁴
Gas, natural					
Produced thousand cubic meters	18,944 ^r	62,707 ^r	53,040 ^r	64,751 ^r	61,454 ⁴
Petroleum:					
Crude ¹⁰ thousand 42-gallon barrels	795 ^r	905 ^r	744 ^r	1,069 ^r	2,734 ⁴
Refinery products: ¹¹					
Naphtha do.	11,330 ^r	14,377 ^r	14,052 ^r	2,614 ^r	2,836 ⁴
Gasoline, motor ¹² do.	100,892 ^r	112,284 ^r	111,407 ^r	61,578	63,728 ⁴
Kerosene do.	58,060 ^r	63,385 ^r	67,604 ^r	65,968 ^r	66,687 ⁴
Petroleum coke do.	6,124	6,459	8,798	16,998	18,932 ⁴
Lubricants do.	1,074	1,914	1,574	1,155	1,337 ⁴
Total do.	177,479	198,418	203,436	148,313	153,520 ⁴

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

¹Table includes data available through August 22, 2014.

²In addition to the mineral commodities listed, lime, sulfur, and petroleum refinery products, such as distillate fuel oil, jet fuel, liquefied petroleum gas, refinery fuel, and residual fuel oil are produced, but information is inadequate to make reliable estimates of output.

³Sources: Industria y Minería. Ministerio de Industria, Turismo y Comercio—Secretaría General de Energía. Instituto

Geológico y Minero de España.

⁴Reported figure.

⁵Source: World Steel Association.

⁶Source: Almonty Industries Inc.

⁷Peat production was only used for agriculture.

⁸Includes sand obtained as a byproduct of feldspar and kaolin production.

⁹Not elsewhere specified.

¹⁰Production has been converted to barrels from metric tons by using the U.S. Energy Information Administration's factor of 7.440 barrels per metric ton (bbl/t) of crude petroleum.

¹¹Production has been converted from metric tons to barrels by using the U.S. Energy Information Administration's factor of 5.51 barrels per metric ton (bbl/t) for petroleum coke; 8.53 bbl/t for gasoline; 7.73 bbl/t for kerosene; 7.00 bbl/t for lubricants; and 8.22 bbl/t for naphtha.

¹²Includes other gasolines.

TABLE 2
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Alumina	Alumina Española, S.A. (AES A) (Alcoa Inc., 60%, and Alumina Ltd., 40%)	Refinery at San Ciprian, Lugo Province	1,500
Aluminum	Alcoa Inespal S.A. (AISA) (Alcoa Inc., 100%)	Smelter at Aviles, Asturias Province	93
Do.	do.	Smelter at La Coruña Province	87
Do.	do.	Smelter at San Ciprian, Lugo Province	228
Cement	A.G. Cementos Balboa S.A. (Grupo Alfonso Gallardo)	Alconera, Badajoz Province	1,600
Do.	Cementos Cosmos S.A. (Votorantim Group)	Pontevedra, Lugo Province	650
Do.	do.	Toral de los Vados, Leon Province	1,600
Do.	Cemex España Operaciones, S.L.U. (Cemex S.A.B. de C.V.)	Alcanar, Tarragona Province	2,185
Do.	do.	Alicante, Levante Province	1,400
Do.	do.	Buñol, Valencia Province	1,361
Do.	do.	Castillejo, Toledo Province	1,730
Do.	do.	Lloseta, Balearic Islands	700
Do.	do.	Morata de Jalon, Zaragoza Province	1,400
Do.	Cementos Lemona S.A. (CRH plc., 98.86%)	Lemona, Vizcaya Province	1,250
Do.	Cementos Molins Industrial, S.A.U. (Cementos Molins, S.A.)	Sant Vicenc dels Horts, Barcelona Province	1,780
Do.	Cementos Portland Valderrivas, S.A.	Alcala de Guidaira, Seville Province	1,450
Do.	do.	Venta de Baños, Palencia Province	815
Do.	do.	Mataporquera, Cantabria	830
Do.	Cementos Tudela Veguín, S.A. (Masaveu Group)	Careño, Oviedo, Asturias Province	2,400
Do.	do.	La Robla, Leon Province	850
Do.	do.	Tudela Veguín, Oviedo Province	200
Do.	Holcim (España), S.A. (Holcim Ltd.)	Carboneras, Almería Province	1,500
Do.	do.	Gardor, Almería Province	1,000
Do.	do.	Jerez de la Frontera, Cadiz Province	1,000
Do.	do.	Yeles, Toledo Province	975
Do.	Lafarge Cementos S.A.	Montcada i Reixac, Barcelona Province	900
Do.	do.	Sagunto, Valencia Province	1,700
Do.	do.	Villaluenga de la Sagra, Toledo Province	2,350
Do.	Sociedad Financiera, S.A. (Italcementi Group)	Añorga, Gipuzkoa Province	1,050
Do.	do.	Arrigorriaga, Vizcaya Province	1,125
Do.	do.	Malaga, Malaga Province	1,575
Coal			
Do.	Alto Bierzo S.A. (Grupo Lamelas Vitoria)	Various mines	NA
Do.	Carbonar, S.A.	Mines at Vega de Rengos, Asturias Province	NA
Do.	Carbones Arlanza S.L.	Mines at Solita y Bravo	NA
Do.	Carbones del Puerto S.A.	Mines at Esmeralda	NA
Do.	Carbones San Isidro y Maria S.L.	Mines at San Isidro	NA
Do.	Cia General Minera de Teruel S.A.	Mines at Elvira	NA
Do.	Coto Minero Catabrico S.A.	Mines at Coto, Catabrico and Unica	NA
Do.	Empresa Nacional de Electricidad S.A.	As Pontes Mine, and Andorra Mine, a Coruña	NA
Do.	Empresa Carbonifera del Sur, Encausar, S.A.	Mine at Puertollano	NA
Do.	Hijos de Baldomero Garcia S.A (Grupo Lamelas Vitoria)	Mines at Villablino, Leon Province	NA
Do.	Hulleras del Norte S.A. (HUNOSA)	Various mines and plant	NA
Do.	La Carbonifera del Ebro S.A.	Mines at Sant Jordi	NA
Do.	Minera Catalano Aragonesa S.A.	Mines at Ariño	NA
Do.	Sociedad Anonima Hulleras Vasco-Leonesa S.A.	Santa Lucía Mine, Leon Province	NA
Do.	Union Minera del Norte, S.A.	Various mines	NA
Copper, metal, content	Atlantic Copper S.A. (Freeport MacMoRan Copper & Gold Inc., 100%)	Smelter at Huelva Province	330
Do.	Cobre Las Cruces, S.A. (First Quantum Minerals Ltd., 100%)	Las Cruces Mine at Seville Province	210
Do.	do.	Refinery at Seville Province	70
Do.	Kinbauri España, S.L.U. (Orvana Minerals Corp., 100%)	El Valle-Boinas and Carles Mines, Asturias Province	7
Do.	Rio Narcea Recursos. S.A. (Lundin Mining Corp., 100%)	Aguablanca Mine, Extremadura Region	7

See footnotes at end of table.

TABLE 2—Continued
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual ^c capacity
Copper, metal, content		Elmet S.L.U. (Metallo Chimique N.V.)	Smelter at Berango, Biscay Province	96
Do.		Minas de Aguas Teñidas, S.A.U. (MATSA) (Trafigura Beheer B.V)	Mines and plant at Almonaster la Real, Huelva Province	30
Dunite		Pasek España S.A.	Mines and plant at Landoy, Ortigueira, La Coruña Province	1,000
Fluorspar		Minerales y Productos Derivados S.A. (MINERSA)	Mine and plant at Ribadesella, Asturias Province	140
Do.		Minera Orgiva SL	Mine at Lujar, Granada Province	NA
Gold	kilograms	Kinbauri España, S.L.U. (Orvana Minerals Corp., 100%)	El Valle-Boina and Carles Mines, Asturias Province	2,000
Lead, metal, content		Minas de Aguas Teñidas, S.A.U. (MATSA) (Trafigura Mining Group)	Mines and plant at Almonaster la Real, Huelva Province	7
Magnesite		Magnesitas Navarras S.A. (Groupe Roullier, 40%, and Grecian Magnesite S.A., 40%)	Mine at Eugui and plant at Zubiri, Navarra Province	170
Do.		Magnesitas de Rubián S.A.	Plant at Monte Castelo	70
Nickel, metal, content		Río Narcea Recursos. S.A. (Lundin Mining Corp., 100%)	Aguablanca Mine, Extremadura Region	8
Petroleum:				
Crude		Repsol YPF, S.A.	Oilfield at Albatros	NA
Do.		do.	Oilfield at Poseidon Norte and Sur	NA
Do.		do.	Oilfields at Angula, Boqueron, Casablanca, and Rodaballo	NA
Do.	42-gallon barrels per day	Repsol YPF, S.A., 100 %	Oilfield at Lubina	2,500
Do.	do.	Repsol YPF, S.A., 68.67%	Oilfield at Montanazo	2,500
Refined	do.	BP p.l.c., 100%	Castellon refinery, Iberia	45,000
Do.	do.	Compañía Española de Petróleos S.A (International Petroleum Investment Co., 100%)	Refinery at Gibraltar-San Roque, Cadiz Province	245,000
Do.	do.	do.	Refinery at La Rabida, Huelva Province	194,000
Do.	do.	do.	Refinery at Tenerife, Santa Cruz de Terenife Province	92,000
Do.	do.	Refinería de Petróleos del Norte S.A. (Repsol YPF, S.A., 85.98%)	Bilbao refinery at Muskiz, Biscay Province	245,000
Do.	do.	Repsol YPF, S.A.	Refinery in La Coruña Province	120,000
Do.	do.	do.	Refinery at Cartagena, Murcia Province	220,000
Do.	do.	do.	Refinery at Puertollano, Cuidad Real Province	150,000
Do.	do.	do.	Refinery in Tarragona Province	186,000
Potash, ore		Iberpotash S.A. (ICL Chemical Ltd.)	Mine and plant at Suria and Balsareny, Barcelona Province	1,000
Sepiolite		Grupo Tolsa S.A.	Mine and plant in Madrid Province	600
Do.		Minería y Tecnología de Arcillas (Grupo SAMCA)	Mines in Zaragoza Province	120
Silver	kilograms	Kinbauri España, S.L.U. (Orvana Minerals Corp., 100%)	El Valle-Boina and Carles Mines, Asturias Province	5,500
Sodium sulfate		Grupo Industrial Crimidesa S.L.	Mine and plant at Cerezo de Rio Tiron, Burgos Province	700
Steel		ArcelorMittal Corp.	Plants at Aviles and Gijon, Asturias Province; Sagunto, Valencia Province; and Sestao, Biscay Province	8,000
Do.		Compañía Española de Laminacion S.L. (Celsa Group, 100%)	Plant in Barcelona Province	2,500
Do.		Corporación Gerdau Sidenor S.A. (Sidenor) (Gerdau Group, 50%)	Plant at Basaur, Biscay Province	2,500
Do.		do.	Plant at Reinosa, Cantabria Province	NA
Do.		do.	Plant at Azkoitia, Gipuzkoa Province	NA
Do.		do.	Plant at Vitoria, Alava Province	NA
Strontium		Solvay Minerales S.A.	Mines and plant at Escuzar, Granada Province	90
Do.		Bruno S.A.	Mine and plant at Montevives, Granada Province	50

See footnotes at end of table.

TABLE 2—Continued
 SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual ^c capacity
Tungsten	Daytal Resources Spain S.L. (Almonty Industries Inc.)	Los Santos Mine, Salamanca Province	400
Zinc, metal, content	Asturiana de Zinc S.A. (Glencore Xstrata plc, 100%)	Electrolytic zinc at San Juan de Nieva, Castrillon, Asturias Province	511
Do.	Minas de Aguas Teñidas, S.A.U. (MATSA) (Trafigura Beheer B.V)	Mines and plant at Almonaster la Real, Huelva Province	58

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