

SPAIN

By Harold R. Newman

Spain, which has an area of 506,000 square kilometers, has some of the most mineralized territory in Western Europe and was a significant European producer of nonferrous and precious metals. The main polymetallic deposits, from west to east, include Tharsis, Scotiel, Rio Tinto, and Aznalcollar. In terms of value of mine output of metallic and nonmetallic minerals and quarry products, Spain was one of the leading European Union (EU) countries. Consequently, it had one of the highest levels of self-sufficiency with respect to mineral raw materials among the EU members. Spain has had a long history of base-metal mining, and although the numbers of active operations have significantly decreased in recent years, the country remained an important producer (table 1).

Spain's economy was the 10th largest in the world, and Spain had a higher gross domestic product (GDP) growth rate than any major industrialized country; the country continued to perform well in 2002. The GDP in purchasing power parity was \$870 billion, and per capita GDP was \$21,592. The unemployment rate was 11.4% (International Monetary Fund, 2004¹).

The economic instability in Argentina adversely affected some major Spanish companies, such as the oil company Repsol-YPF S.A. and the power company Empresa Nacional de Electricidad S.A. The economy was bolstered by major projects planned to meet the demands of EU integration, other development projects underway in 2002, and private consumption. Spain has been a member of the EU since 1986, and its adoption of the euro on January 1, 1999, as a standard of currency brought greater macroeconomic stability to the region and eliminated risks associated with multiple exchange rates. On January 1, 2002, the euro became the sole currency for everyday transactions with EU member countries, with the exception of the United Kingdom (U.S. Department of Commerce, 2002§).

Government Policies and Programs

Legislation to abolish state and private monopolies passed in midyear 2000, and the Government continued with its program of liberalizing Spanish industry in 2002. Electricity markets and the natural gas and petroleum sectors continued to be the key targets in the liberalization efforts (U.S. Energy Information Administration, 2002§).

Environmental Issues

Much of Spain's environmental agenda and pace was determined by the EU because of the need to implement

¹References that include a section mark (§) are found in the Internet References Cited section.

the ever-growing body of EU environmental legislation. Environmental issues in Spain include air pollution, deforestation, desertification, and pollution of the Mediterranean Sea from raw sewage and effluents that originate from the offshore production of natural gas and petroleum. The major natural hazard in Spain is the threat of droughts. Environmental regulatory bodies for Spain include the Ministry of Agriculture, the Ministry of the Environment, the Ministry of Labor and Social Matters, and the National Institute for Health and Safety at Work. Major environmental laws include Environmental Impact Assessment, General Order on Health and Safety at Work, Notification of New Substances, and Toxic and Dangerous Waste (CountryWatch, 2002§).

The *Prestige*, which was a single-hulled oil tanker, nearly ran aground in a storm in November and then ruptured, spilling nearly 107,000 metric tons (t) of crude oil. The ship was owned by Liberia-registered Mare Shipping, flew a Bahamas flag of convenience, and was operated by a Greek company. The tanker was towed out to sea, it lost another estimated 107,000 t of oil along the way. The ship broke in half and sank 270 kilometers (km) offshore in 3,500 meters (m) of water. The *Prestige* was estimated to still contain more than 3 million metric tons (Mt) of fuel oil that was slowly leaking from the vessel and rising to the surface; this amount of oil was nearly twice that lost by the tanker *Exxon Valdez* off the coast of Alaska in 1989. The wrecked vessel was expected to continue to leak until 2005. Beaches in Asturias, the Basque country, Cantabria, and Galicia have been polluted. To the south, small slicks were beginning to wash ashore on Portuguese beaches (Alexander's Gas & Oil Connections, 2002a§).

Production

Production exceeded domestic consumption for most nonmetallic minerals, thus leaving surpluses for export. Production of selected commodities is listed in table 1. Primary aluminum metal production remained essentially the same. With few exceptions, mine production was lower than that of 2001. Of the major metals, production of mined lead and mined zinc decreased. Mine production of silver also decreased. Cadmium and copper metal and iron ore were not produced in 2002. Total refined copper production increased, and secondary lead metal output decreased.

Quarried mineral products, particularly quarried stone, accounted for a significant share of the value of all mineral production in Spain. Output of natural gas and petroleum remained about the same. Spain's production of crude oil was limited, and the country continued to be a large importer of mineral fuels. The indices of production of selected sectors, in terms of value, are listed in table 2.

Trade

Spain's international economic profile has grown appreciably in recent years. Spain was one of the 5 leading economies in the EU and the world's 16th leading exporting country. The principal export market was the EU, which accounted for almost 70% of Spain's exports and 65% of its imports. Spain's principal export destinations in 2002 were France (18.9%), Germany (11.4%), and the United Kingdom (9.5%). Principal import sources were France (16.9%), Germany (16.5%), and Italy (8.6%) (Australian Department of Foreign Affairs and Trade, 2002§).

Spain eliminated tariff barriers for imports from other EU countries and applied common EU external tariffs to imports from non-EU countries. Similarly, Spain followed the U.S.-EU mutual recognition agreements in its application of nontariff regulations and conformity assessment procedures applied to certain goods from the United States (U.S. Commercial Service, 2003§). U.S. trade with Spain is listed in tables 3 and 4.

Structure of the Mineral Industry

The mineral industry comprised a mix of state-owned, state- and privately owned, and privately owned companies (table 5). Minerals belong to 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, governed the mineral industry. The General Directorate of Energy Policy and Mines, which is under the Ministry of Economy, implemented these mineral laws. *Sociedad Estatal de Participaciones Industriales* (State Society of Industrial Participation) and the *Instituto Geológico y Minero de España* (Mining and Geological Institution of Spain) were the principal Government mineral-resource agencies. Also, some of Spain's regional governments, such as Andalusia, Asturias, and Catalonia, had interests in the development of mineral resources in their geographic areas.

Commodity Review

Metals

Alumina and Aluminum.—Alumina and primary aluminum were produced almost entirely by Alcoa Inespal S.A. Alcoa was a holding company with three primary aluminum plants and three flat-rolled sheet and extrusions plants. *Alúmina Española S.A.* (a subsidiary of Alcoa), which was located near San Ciprian, was Alcoa's only European producer of alumina and alumina hydrates. The company was also a producer of primary aluminum in standard sheets and special aluminum alloys.

Copper.—MK Gold Co. reported that the Environmental Department of the Government of Andalusia approved the environmental impact study for the development of the Las Cruces copper project. Las Cruces is located 20 km northwest of Seville and was estimated to contain reserves of 15.8 Mt at about 5.94% copper, which occurs predominately as chalcocite. The open pit operation would be designed to produce 3,500 metric tons per day of ore, and copper output scheduled at

72,000 metric tons per year (t/yr). Tailings from the process will be filtered, dry stacked, and sealed in marl. The Las Cruces operation was located near Boliden Apirsa S.A.'s Los Frailes operation where a tailings dam burst and flooded water courses with millions of cubic meters of material. The Los Frailes Mine closed in 2001 (Mining Journal, 2002a).

In connection with its review of the mining concession application, the Regional Government of Andalusia requested that MK Gold undertake a program of additional geotechnical studies to supplement the information contained in its feasibility study. This work will delay the granting of the mining concession. Nevertheless, MK Gold expected that all necessary operating permits would be granted by midyear 2003 (Mbendi, 2002a§).

Navan Resources Ltd.'s Aguas Teñidas copper-lead-zinc operations near Huelva were suspended in December 2001, and a creditor protection application (*Suspension de Pagos*), which is similar to a Chapter 11 bankruptcy in the United States, was filed with the Spanish courts. Navan placed the assets on the market and announced that it sold Aguas Teñidas to a Spanish mining services company for royalty payments up to a maximum of \$2.66 million based on a percentage of future operating revenues. Navan's other assets, which included the closed Almagrera S.A., would be liquidated (Reuters, 2002§).

Atlantic Copper Holding S.A. reported strong operating results in 2002 in terms of throughput and production. The Huelva facility treated 14% more concentrate and scrap and produced 6% more anodes than in 2001. Sales of refined copper in the form of cathode, wire, and wire rod, totaled about 255,000 t (Freeport-McMoRan Copper and Gold Inc., 2002§).

Elmet SL was considering expanding its foundry with the addition of a greater capacity furnace that would allow an increase of from 30% to 40% in production. Elmet was authorized by the Ministry of Environment of Basque Country to treat contaminated metal packaging, copper residues, galvanic copper, nickel, television screens, tin, and zinc sludge. The foundry had the capacity to smelt 90,000 t/yr of raw material from residues with copper or tin content to produce 25,000 t/yr of black copper, which was sold to Atlantic Copper S.A., Kaiser Lunen AG, and Metallo Chemique NV of Belgium. Elmet had the capacity to produce 50,000 t/yr of copper cathode from copper anode. The 6-megawatt (MW) Wartsila cogeneration plant supplied electricity to the plants and provided any surplus in kilowatts to the electricity grid (Bilboa Biscay, 2002§).

Elmet had an exclusive contract to melt down Ireland's old coinage. It planned to melt 7,000 t and recover about 4,000 t of copper (Financial Times, 2002a).

Gold.—Cambridge Mineral Resources plc of the United Kingdom received initial findings by Steffen Robertson and Kirsten (UK) Ltd. (SRK) concerning the latter's study of Cambridge's polymetallic (copper, gold, lead, and zinc) Lomero-Poyatos property in southern Spain. Cambridge acquired the property through the acquisition of Spanish mining company Recursos Metalicos SL in 2000. The deposit was first mined in 1853 and until 1991 yielded about 2.6 Mt of pyrite that averaged 1.2% copper and 5 grams of gold per metric ton of ore (g/t), which was the highest recorded gold grade in the Iberian Pyrite Belt (IPB). SRK estimated resources to be more

than 20 Mt at a grade of 70 g/t silver, 3.1 g/t gold, 3.3% zinc, 1.2% copper, and 1.2% lead (Cambridge Mineral Resources plc, 2002§).

Cambridge concluded that the resource could support a higher mining rate than previously thought and revalued the deposit accordingly. SRK's study indicated the viability of a 17-year 350,000-t/yr operation with at least 8 years of open pit operation, after which underground mining would begin. Production was expected to start in about 2 years. Cambridge could possibly use the Almagrera processing plant (closed), which was the closest available plant. Cambridge estimated recoveries of 78% for zinc, 75% to 77% for gold, and 50% for copper. These are typical recoveries for deposits of the IPB. Although the ore is refractory and gold mineralization is associated with sulfides, the gold is located between (rather than within) sulfide crystals and, as such, should be easily extracted by crushing (Mining Journal, 2002b).

Rio Narcea Gold Mines Ltd. was a mineral-resource company with exploration activities, development projects, and operations in Portugal and Spain. Rio Narcea produced gold at its Carles and El Valle Mines. The start of mining at the high-grade Charnela zone at El Valle boosted output significantly. Grades exceeded expectations, and the blending of Charnela's ore with lower grade ores increased plant feed grades to 13 g/t. Plant recovery averaged about 96%. Rio Narcea expected production to approach 4,700 kilograms in 2002 (Northern Miner, 2002).

Metallurgical Design and Management (MDM) of South Africa was conducting a feasibility study at Rio Narcea's Corcoesto gold project in the center of the Malpica Gold Belt. Corcoesto comprises five gold-mineralized zones hosted by a well-developed sheeted quartz vein system that formed large silica-rich envelopes in altered metamorphic rocks. The study called for an open pit heap-leach operation that would ship loaded carbon to El Valle for refining into doré bars (Northern Miner, 2002).

Iron Ore.—Compañía Andaluza de Minas S.A.'s mine, which was located near Alquife, was closed in 2000 owing to the low grade of the ore. The small amount of iron ore from stockpiles that was produced in 2002 was for nonmetallic applications (Carmen Marchan, Mining Engineer, Instituto Geológico y Minero, written commun., December 10, 2003).

Mercury.—The mercury deposits of Minas de Almadén y Arrayanes S.A. at Almadén accounted for the largest quantity of liquid mercury metal produced in the world. Its production from historical times totaled about 250,000 t, which was about one-third of the total amount of mercury ever produced. Almadén is located about 200 km south of Madrid in the Province of Ciudad Real in the Brown Mountains. Mercury has been mined at Almadén, which was the largest mercury mine in the world, for more than 2,000 years (Mercury Technology Services, 2002§).

Although Minas de Almadén has ceased mining activity, the company possessed enough stockpiled mercury metal to satisfy world demand. The smelter was expected to close in 2003 (Carmen Marchan, mining engineer, Instituto Geológico y Minero, written commun., December 10, 2003).

Nickel.—MDM completed a positive feasibility study for the development of the open pit portion of the Aguablanca nickel project in southwestern Spain. The mine plan was based on a 10- to 12-year open pit operation that would produce about 10,000 t/yr of nickel-in-concentrate, which would constitute about one-half of the EU's nickel mine production. The mine was also expected to produce about 6,000 t/yr of copper-in-concentrate, and a small amount of platinum-group metals would be produced as byproducts. Rio Narcea acquired a 100% interest in the property in 2001 when it bought the Spanish Government's 50% interest and Atlantic Copper's 50% interest (Mining Journal, 2002c).

Steel.—Aceralia S.A. (Spain's largest steelmaker), Acieries Reunies de Burbach-Eich-Dudelang (ARBED) of Luxembourg, and the Usinor Group of France merged their businesses and specialities at yearend 2001; the merger became official in February 2002. The Arcelor Group, which was the name of the new company, was the world's largest steel group and will have the capacity to produce 46 million metric tons per year (Mt/yr) of liquid steel, which corresponds to a sales volume of about \$30 billion. It will focus its activities on the following sectors: flat carbon steel products, long carbon steel products, stainless steel products, and distribution, processing, and trading. The European Commission gave permission for the integration in November 2001 (Arcelor Group, 2002§).

Arcelor announced that it was continuing with expansion projects in the 2002 to 2004 industrial plans. These included expansion of capacity at the Aviles works hot-strip mill and upgrades of several coating and tinning lines, doubling the capacity of the No. 3 shop to 5 Mt/yr, an increase in capacity for coal injection at the two blast furnaces at the Aviles-Gijon works, increase in capacity in the hot-strip minimill, and installation of an electric arc furnace. A separate project involved the upgrading of the plant's rail mill, which would increase production capacity to about 200,000 t/yr and would enable it to produce rails up to 90 m long (Metal Bulletin, 2002b).

Sidenor S.A. was studying the feasibility of melting stainless steel in Europe. The alloy steel long products group already made stainless and special steel at its Acos Villares subsidiary in Brazil. Sidenor may add new equipment and modify the vacuum metallurgy facilities at its mill in Reinosa if the project goes ahead. Sidenor had a record of expansion and acquisition. Before acquiring Arços Villares in 2000, it bought two special steel mills in Mexico. The company believed that long-term viability and growth rests on forming links with non-European steel producers in markets with high growth potential. The automotive sector was Sidenor's largest client (Metal Bulletin, 2002d).

Acerinox S.A. may move some of its production away from Spain to its newly acquired plant, Columbus Stainless, in Middelburg, South Africa, owing to high electricity costs in Spain. Acerinox complained that Spain has become a high-cost country as far as power was concerned. In addition, Acerinox's Algeciras works had six power cuts in 2001 that totaled 26 hours. The company said that its electricity costs in South Africa were less than one-half of those in Spain. Slabs produced

at Columbus could be sent to Acerinox's other works for rolling (Metal Bulletin, 2002a).

A shakeout of the motor vehicle dismantling and scrap industry was predicted as new rules were introduced for reclaiming material from end-of-life vehicles (ELVs). Industry groups wanted to establish a joint strategy and an integrated system to raise the quantity of materials and spare parts reclaimed from ELVs to meet national recycling targets of 85% by weight in 2006 and 95% by weight by 2015. Between 2002 and 2006, ELVs in Spain could supply 600,000 t of scrap metal and from 130,000 t to 150,000 t of other materials (Metal Bulletin, 2002c).

Industrial Minerals

Cement.—The Lafarge Group announced that it had signed an agreement to sell two 1.38-Mt/yr-total-cement-capacity Asland S.A. cement plants to Cementos de Portugal S.A. Included was the grinding station Cementos d'El Monte, which was located near the port of Palos de la Frontera, and a terminal in Seville. The transaction would have to be approved by the competition authorities (International Cement Review, 2003).

Clays.—Spain maintained its world leadership in sepiolite production and held 70% of the world's reserves, which are located mostly around Madrid. The largest deposit was thought to be in excess of 15 Mt. Because high freight costs have reduced profitability, speciality clay producers tended to concentrate on alternative markets, such as foundry, pet litter, and rheological additives (Groupo Tolsa, 2002§).

Potash.—Iberpotash S.A. was a 100% owned subsidiary of Dead Sea Works Ltd. (DSW), which was the world's fourth largest producer of potash. The company was a part of DSW's strategy to be a major presence in potash. Iberpotash mines represent one of the most important potash resources in Western Europe and are located near major potash-consuming areas of the EU. Iberpotash mined sylvinitic and sylvite ore from the Cataluna deposit in the Suria area near Barcelona (Dead Sea Works Ltd., 2002§).

Soda Ash.—Solvay S.A., which was the leading sodium carbonate (soda ash) supplier in Europe, was building a new 80,000-t/yr sodium bicarbonate production line at its soda ash plant in Torrelavega. The location, which is close to the port of Santander, will provide the possibility of combining sodium bicarbonate exports with high-volume movements of soda ash exports. The new line will bring the company's total European production of sodium bicarbonate to 450,000 t/yr (Solvay S.A., 2002§).

Mineral Fuels

The Government approved an 800-MW, gas-fired, combined-cycle plant proposed by Union Fenosa S.A. for Palos de la Frontera near Huelva, southern Andalusia. The authorization follows approval for the project by the Ministry of the Environment. This development depended on the Andalusian government approving the installation of a 2.5-km 220-kilovolt

(kV) line that would connect the first unit to the national grid and then a 99-km 400-kV line when the entire 800 MW is to come online. This is one of nine plants that Union Fenosa had in the development or early planning stages. The capacity of the nine plants will total 6,800 MW (Alexander's Gas & Oil Connections, 2002b§).

Coal.—Coal reserves were abundant but difficult to mine. Consequently, the cost of production was high because of difficult mining conditions, which made Spanish coal less competitive than that of many other countries. The leading producer of bituminous coal was Huelleras del Norte S.A., and the leading producer of lignite was Empresa Nacional de Electricidad S.A. Production has fallen in recent years and could eventually be phased out despite EU subsidies to maintain production. In 2002, 95% of coal produced was used to generate electricity (Mbendi, 2002b§).

The EU required that mining subsidies be phased out; it can, however, authorize payments to assist in the restructuring of an industry that might falter without public money. The EC authorized the Government to grant aid of up to about \$1.25 billion in 2002. Most mines were located in isolated regions far from centers of economic development. The EC stated that its decision took into account the importance of Spain's coalfields from a social and a regional point of view (EU Business, 2002§).

Natural Gas.—The Government unveiled new natural gas sector rules to bring gas prices closer to European levels and to provide regulatory stability for the electricity companies that develop combined-cycle plants fueled by natural gas. The change not only reduced tariffs, but also allowed for the separation of Enagas S.A., which operated the gas infrastructure, from the de facto gas monopoly owned by Repsol-YPF, which controlled sales and transport. The changes were part of the Government's energy liberalization plan to bring competition to the gas market (Financial Times, 2002b).

Petroleum.—Repsol-YPF was proceeding with its plans to explore offshore between the Canary Islands and the coast of Morocco despite Moroccan protests. The company submitted its exploration program to the authorities of Fuerteventura, which is one of the Canary Islands, and was awaiting their decision. It also requested and was granted exploration rights to nine blocks between Fuerteventura and the Moroccan coast. Morocco objected to this as an intrusion into its territorial waters and took its case to the United Nations. Exploration in these areas was classified as high-risk exploration, which means there is little or no evidence of existing hydrocarbons (Oil & Gas Journal, 2002).

Renewable Energy.—Spain distinguished itself as a world leader in the use of different types of renewable energies. The country placed strong emphasis on hydroelectricity and had plans for 150 wind farms to add to its total. Spain was the world's third largest generator of renewable energy after Germany and the United States and had already reached the standards set by the EU that required that 12% of each member country's electricity to be derived from alternate energies

by 2012. Iberdrola S.A. generated 41% of its product from renewable sources, mainly hydropower (Alexander's Gas and Oil Connections, 2002c§).

References Cited

- Financial Times, 2002a, Irish coins: Financial Times, March 7, p. 3.
Financial Times, 2002b, Spain unveils new gas sector rules: Financial Times, February 19, p. 18.
International Cement Review, 2003, Spanish units sold to Cimpor: International Cement Review, issue 57, January 2003, p. 1.
Metal Bulletin, 2002a, Acerinox may switch slab production to South Africa: Metal Bulletin, no. 8643, January 24, p. 13.
Metal Bulletin, 2002b, Arcelor affirms plan for expansion of Spanish plants: Metal Bulletin, no. 8639, January 10, p. 14.
Metal Bulletin, 2002c, ELV rules will reshape Spanish dismantling industry: Metal Bulletin, no. 8643, January 24, p. 9.
Metal Bulletin, 2002d, Sidenor project may lead to stainless production in Spain: Metal Bulletin, no. 8650, February 18, p. 20.
Mining Journal, 2002a, Las Cruces EIS approved: Mining Journal, v. 338, no. 8686, May 24, p. 378.
Mining Journal, 2002b, Lomero-Poyatos viable: Mining Journal, v. 339, no. 8698, August 16, p. 119.
Mining Journal, 2002c, Spanish nickel study positive for Rio Narces: Mining Journal, v. 339, no. 8697, August 9, p. 91.
Northern Miner, 2002, Boliden files suit against Spanish construction firm: Northern Miner, v. 88, no. 35, October 21, p. 5.
Oil & Gas Journal, 2002, Repsol seeks approval for Canary Islands exploration plan: Oil & Gas Journal, v. 100, no. 15, April 15, p. 8.

Internet References Cited

- Alexander's Gas & Oil Connections, 2002a (December 12), Oil spill contaminates Spanish coast, accessed December 13, 2002, at URL <http://www.gasandoil.com/goc/news/nte25068.htm>.
Alexander's Gas & Oil Connections, 2002b (May 16), Spain approves 800 MW power plant proposed by Union Fenosa, accessed May 20, 2002, at URL <http://www.gasandoil.com/goc/company/cne22091.htm>.
Alexander's Gas & Oil Connections, 2002c (May 29), Spain world leader in use of renewable energy, accessed June 3, 2002, at URL <http://www.gasandoil.com/goc/news/nte22291.htm>.
Arcelor Group, 2002 (February), This is Arcelor, accessed December 16, 2003, at URL <http://www.arcelor.com/index.php?page=73&ingld=1>.
Australian Department of Foreign Affairs and Trade, 2002 (October), Spain, Country Brief, accessed December 1, 2003, at URL http://www.dfat.gov.au/geo/spain/spain_brief.htm.
Bilboa Biscay (Europe), 2002 (October), Elmet considers expanding the foundry with a new furnace, accessed January 24, 2003, at URL http://www.bilboa.biscay.org/english/info/news_print.asp?id_noticia=580&title=NEWS.

- Cambridge Mineral Resources plc, 2002 (December), Making the transition from exploration to production, accessed December 10, 2003, at URL http://www.cambmin.co.uk/report/whi_research.pdf.
CountryWatch, 2002, (February), Environmental issues in Spain, accessed July 18, 2003, at URL <http://www.countrywatch.com/eschool/cw-country.asp?vCountry=160>.
Dead Sea Works Ltd., 2002, Iberpotash S.A.—Spain, accessed December 30, 2003, at URL <http://www.iclfertilizers.com/iberp.htm>.
EU Business, 2002 (September), Brussels authorizes Spanish state aid to coal industry, accessed September 6, 2002, via URL <http://www.eubusiness.com>.
Freeport-McMoRan Copper and Gold Inc., 2002, Annual report, accessed December 15, 2003, at URL http://www.fcx.com/inrl/annualrpt/2002_fcx_ar/operation%208_20.pdf.
Grupo Tolsa, 2002, Tolsa Group—Raw materials, accessed August 13, 2002, at URL <http://www.tolsa.com/in/materias.htm>.
International Monetary Fund, 2004 (April), World database, accessed May 28, 2004, at URL <http://www.imf.org/external/pubs/ft/weo/2004/01/data/dbcoutm.cfm>.
Mbendi, 2002a (November), Las Cruces copper mine permitting due mid 2003, accessed December 4, 2003, at URL http://www.mbendi.co.za/a_sndmsg/news_view.asp?I=42766.
Mbendi, 2002b (July), Spain—Coal mining, accessed July 2, 2002, at URL <http://www.mbendi.co.za/indy/ing/coal/eu/p005.htm>.
Mercury Technology Services, 2002 (August), Almadén, Spain, accessed December 23, 2003, at URL <http://www.hgtech.com/Mines/Almaden.htm>.
Reuters, 2002 (November), Navan sells Spanish assets, accessed November 4, 2003, at URL http://www.biz.yahoo.com/rf/021104/markets_minerals_navan_1.htm.
Solvay S.A., 2002 (May), Solvay increases its production capacity of sodium bicarbonate, accessed December 31, 2003, at URL <http://www.solvaypress.com/pressreleases/0,6411,124-2-0,00.htm>.
U.S. Commercial Service, 2003 (June), Doing business in Spain, accessed December 1, 2003, at URL <http://www.buyusa.gov/spain/en/page1.html>.
U.S. Department of Commerce, 2002 (May), Sunny Spain—Bright outlook for trade, USATrade, accessed November 20, 2003, at URL <http://www.usatrade.gov/Website/website.nsf/whatsnew05/002>.
U.S. Energy Information Administration, 2002 (January), Spain, Country Analysis Brief, accessed October 14, 2003, at URL <http://www.eia.doe.gov/emeu/cabs/spain.html>.

Major Sources of Information

- Instituto Geológico y Minero de España
Rio Rosas, 23
28003 Madrid, Spain
General Directorate of Energy Policy and Mines
Doctor Fleming, 7
28036 Madrid, Spain

TABLE 1
SPAIN: PRODUCTION OF MINERAL COMMODITIES ¹

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001	2002 ^c	
METALS						
Aluminum:						
Alumina ^{e, 2}	1,100,000 ³	1,100,000	1,200,000	1,100,000	1,000,000	
Metal:						
Primary	361,900	363,900	365,700	376,400	380,100 ³	
Secondary	154,000	224,000	240,520	221,720	242,600 ³	
Total	515,900	587,900	606,220	598,120	622,700 ³	
Cadmium, metal	196	--	--	--	--	
Copper:						
Mine output, Cu content	37,002	1,738	23,312	9,748	--	
Metal:						
Blister:						
Primary	304,330	292,800	258,600 ^r	255,200 ^r	268,000	
Secondary ^c	30,000	25,000	31,300 ^r	24,700 ³	30,000	
Total	334,330	317,800	289,900 ^r	279,900 ^r	298,000	
Refined:						
Primary	239,600	250,756	258,000	235,100	262,400 ³	
Secondary ^c	64,700	65,000	58,000	55,600 ³	60,000	
Total	304,300	315,756	316,000	290,700	322,400 ³	
Germanium oxide, Ge content ^c	kilograms	6,500	6,000	6,000	6,000	5,000
Gold, mine output, Au content	do.	3,295	5,018	4,310	3,720	3,600
Iron and steel, metal:						
Pig iron	thousand tons	4,235	4,146	4,059	4,094	3,978 ³
Ferroalloys, electric furnace	do.	190 ^e	179	180	180 ^e	175
Of which ferrochromium, crushed ^c		1,000	1,000	950 ³	--	--
Steel:						
Crude	thousand tons	14,827	14,886	15,844	15,834	16,358 ³
Hot rolled	do.	13,259	13,846	14,599	14,931	15,000
Lead:						
Mine output, Pb content		21,900	41,800	40,300	36,000	5,000
Metal, secondary ^c		90,000	96,000	120,000	121,600 ³	100,000
Mercury, metal	thousand tons	7	4	9	8	3
Silver, mine output, Ag content	kilograms	47,000	96,000	83,000	60,000 ^e	50,000
Tin, mine output, Sn content ^c		2,000	2,000	1,819	708	500
Titanium dioxide ^c		16,000	16,000	--	--	--
Uranium, mine output, U ₃ O ₈ content		335	362	623	645	500
Zinc:						
Mine output, Zn content	kilograms	138,014	154,062	200,021	164,900	69,900
Metal, primary and secondary	do.	358,300	393,000	387,100	418,000 ^r	488,000
INDUSTRIAL MINERALS						
Barite, BaSO ₄		70,000	62,000	32,653	44,000	26,000
Bromine ^c		100	100	--	--	--
Calcium carbonate ^c		1,880	1,950	2,000	2,000	2,000
Cement, hydraulic, other than natural	thousand tons	38,080	35,830	38,154	40,512	40,000
Clays:						
Attapulgit		130,000 ^e	130,000 ^e	28,307	24,477	25,000
Bentonite		193,000	190,000 ^e	90,152	90,000 ^e	90,000
Kaolin, washed		310,000	320,000	353,355	400,000 ^e	400,000
Other ^c	thousand tons	20,000	15,000	15,000	15,000	15,000
Diatomite and tripoli ^c		56,000	55,000	66,770 ³	57,000	50,000
Feldspar		430,000	450,000	478,260	500,000 ^r	500,000
Fluorspar, CaF ₂ content:						
Acid-grade		110,000 ^e	133,000	132,690	126,535	110,000
Metallurgical-grade		14,000 ^e	9,000	7,776	7,504	5,000
Total		124,000 ^e	142,000	140,466	134,039	115,000
Gypsum and anhydrite, crude	thousand tons	7,500	9,450	9,929	10,900 ^e	10,000

See footnotes at end of table.

TABLE 1--Continued
 SPAIN: PRODUCTION OF MINERAL COMMODITIES ¹

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001	2002 ^c
INDUSTRIAL MINERALS--Continued					
Kyanite, andalusite, related materials ^c	2,500	2,500	--	--	--
Lime, hydrated and quicklime ^c thousand tons	1,500	1,500	1,500	1,500	1,500
Magnesite, calcined	201,000	211,000	160,000	156,000	150,000
Mica ^e	2,500	2,500	10,086 ³	10,000	10,000
Nitrogen, N content of ammonia thousand tons	460	437	442	436	415 ³
Pigment, mineral:^c					
Ocher do.	70	70	87 ³	87	80
Red iron oxide	15,000	15,000	--	-- ³	--
Potash, K ₂ O equivalent	597,000	549,000	646,294	569,127	550,000
Pumice ^c	600,000	600,000	761,540 ³	770,000	750,000
Pyrite, including cuprous, gross weight thousand tons	868	733	205	152	100
Salt:					
Rock, including byproduct from potash works do.	2,200	2,200	2,328	2,500	2,500
Marine and other do.	1,200	1,400	1,541	1,600	1,600
Sand and gravel, silica sand ^{e, 4} do.	62,000	65,000	86,321 ³	95,000	95,000
Sepiolite, meerschäum	750,000	800,000	794,114	896,983	800,000
Sodium compounds, n.e.s.:					
Soda ash, manufactured ^c thousand tons	500	500	500	500	500
Sulfate, natural:^c					
Glauberite, Na ₂ SO ₄ content	650,000	675,000	669,256 ³	705,000	700,000
Thenardite, Na ₂ SO ₄ content	180,000	200,000 ³	167,800 ³	168,000	160,000
Manufactured	125,000	125,000	125,000	125,000	125,000
Stone:^c					
Chalk thousand tons	136	136	889 ³	980	1,000
Dolomite do.	5,000	9,080	8,752 ³	9,628 ³	9,000
Limestone do.	2,200	2,200	2,400 ^r	2,500	2,500
Marble, ornamental do.	2,400	3,850	3,687 ³	4,100	4,000
Marl do.	9,845 ³	10,030	9,966 ³	10,495 ³	10,000
Basalt do.	1,000	1,000	3,044 ³	3,348 ³	3,400
Granite, ornamental do.	1,400	1,750	1,188 ³	1,200	1,200
Ophite do.	2,000	2,000	2,579 ³	2,840 ³	2,800
Phonolite do.	650	650	1,479 ³	1,630 ³	1,600
Porphyry do.	1,000	1,000	2,159 ³	2,483 ³	2,500
Quartz do.	1,500	1,720	1,961 ³	2,150 ³	2,000
Quartzite do.	2,000	2,200	2,131 ³	2,150 ³	2,000
Sandstone do.	2,500	2,500	2,318 ³	2,430 ³	2,500
Serpentine do.	1,000	1,000	794 ³	897 ³	900
Slate do.	615 ³	600	751 ³	790	800
Other do.	1,000	1,000	1,000	1,000	1,000
Strontium minerals, Sr ₂ O ₄ content	111,000	128,000	148,352	143,320	125,000
Sulfur:					
S content of pyrites thousand tons	430	388	94	71	--
Byproduct:^c					
Metallurgy do.	461	455	454	461	544
Petroleum do.	100	110	115	135	140
Coal (lignite) gasification do.	1	1	1	1	1
Total do.	992	954	664 ^r	668 ^r	685
Talc and steatite	110,000 ^e	111,000	114,654	115,000 ^e	115,000
MINERAL FUELS AND RELATED MATERIALS					
Coal, marketable:					
Anthracite thousand tons	6,393	5,436	4,651	4,694	4,500
Bituminous do.	6,004	6,828	6,173	5,797	5,500
Lignite, black and brown do.	13,675	12,535	12,153	12,193	12,000
Total do.	26,072	24,799 ^r	22,977 ^r	22,684	22,000
Coke, metallurgical do.	2,649	2,332	2,470	2,400 ^e	2,400

See footnotes at end of table.

TABLE 1--Continued
 SPAIN: PRODUCTION OF MINERAL COMMODITIES ¹

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001	2002 ^c
MINERAL FUELS AND RELATED MATERIALS--Continued					
Gas, natural, marketed million cubic meters	114	143	179	180 ^e	180
Peat ^e	50,000	50,000	50,000	50,000	50,000
Petroleum:					
Crude thousand 42-gallon barrels	4,013	2,295	1,648	2,505	2,500
Refinery products: ^c					
Liquefied petroleum gas do.	18,096 ³	18,000	18,000	18,000	18,000
Naphtha do.	24,990 ³	25,000	25,000	25,000	25,000
Gasoline, motor do.	84,405 ³	85,000	85,000	85,000	85,000
Jet fuel do.	36,000	36,000	36,000	36,000	36,000
Kerosene do.	30,000	30,000	30,000	30,000	30,000
Distillate fuel oil do.	148,969 ³	150,000	150,000	150,000	150,000
Residual fuel oil do.	86,407 ³	85,000	85,000	85,000	85,000
Other do.	37,400 ³	38,000	38,000	38,000	38,000
Refinery fuel and losses do.	10,000	10,000	10,000	10,000	10,000
Total do.	476,000	477,000	477,000	477,000	477,000

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

¹Table includes data available through November 2003.

²Reflects aluminum hydrate.

³Reported figure.

⁴Includes sand obtained as a byproduct of feldspar and kaolin production.

TABLE 2
 SPAIN: SELECTED INDICES OF PRODUCTION

(1995 index = 100)

Sector	1998	1999	2000	2001	2002
General	111.9	114.8	119.3	118.0	118.2
Mining	92.0	90.1	91.1	88.2	82.9
Manufacturing	113.2	115.8	119.7	117.3	117.6
Electricity and gas	108.4	115.1	124.9	130.3	131.5

Source: United Nations, 2003, Monthly Bulletin of Statistics, v. LVII, no. 984, June, p. 16.

TABLE 3
UNITED STATES EXPORT AND IMPORT TRADE WITH SPAIN, 2002

(Million dollars)

Month	Exports	Imports
January	501	422
February	501	384
March	427	471
April	398	535
May	368	495
June	375	426
July	357	521
August	391	473
September	364	406
October	565	446
November	442	562
December	536	536
Total	5,225	5,677

Source: U.S. Census Bureau, Foreign Trade Division, May 2003.

TABLE 4
UNITED STATES TRADE BALANCE WITH SPAIN

(Million dollars)

Year	Exports	Imports	Trade balance
1998	5,454	4,780	673
1999	6,133	5,059	1,074
2000	6,322	5,713	609
2001	5,756	5,197	559
2002	5,226	5,678	-452

Source: U.S. Census Bureau, Foreign Trade Division, May 2003.

TABLE 5
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Alumina Española S.A. (Alcoa Inespal)	Alumina plant at San Ciprian, Lugo	1,000
Aluminum	Aluminio Español S.A. (Alcoa Inespal)	Electrolytic plant at San Ciprian, Lugo	180
Do.	Industria Española del Aluminio, S.A. (Alcoa Inespal)	Electrolytic plant at Aviles	100
Do.	do.	Electrolytic plant at La Coruña	25
Coal:			
Anthracite	Antracitas Gaiztarro S.A.	Mines at María and Paulina	2,000
Do.	Antracitas de Gillón S.A.	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 Corona	15,000
Barite	Minas de Baritina S.A. (Kali-Chemie of Germany, 100%)	Mine and plant in Espiel area, Cordoba	50
Cement	Approximately 36 cement companies, the largest of which was Asland S.A.	54 plants, including:	44,000
Do.	do.	5 (Asland) plants, of which the largest are:	(6,000)
Do.	do.	Plants at Puerto de Sagunto, Valencia,	2,000
Do.	do.	Plants at Villaluenga de la Sagra, Toledo	2,000
Copper:			
Metal	Atlantic Copper Holding S.A. (Freeport-McMoRan Copper and Gold Inc., 65%, and Ercros Group, 35%)	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
Ore, metal	Atlantic Copper Holding, S.A. (Freeport-McMoRan Copper and Gold Inc., 65%, and Ercros Group, 35%)	Mines and plant at Ariertero, near Santiago de Compostela, Corta Atalay open pit mine, Cerro Colorado open pit mine	12
Do.	do.	Alfredo underground mine in the Rio Tinto area	30
Do.	Navan Resources Ltd.	Almagera mine and plant (closed 2001)	6
Do.	Boliden Apiria S.A.	Los Frailes Mine and plant (closed 2001)	5
Dunite	Pasek España S.A.	Mines and plant at Landoy, Ortigueira	1,500
Fluorspar, ore	Fluoruros S.A. (Bethlehem Steel Corp., 49%)	Plant at Caravia, near Colunga	400
Do.	do.	Opencast mines at San Lino and Val Negro and underground mine at Eduardo, near Carav--all in Asturias	350
Do.	do.	Plant at Collada, mines at Venros Sur and Corona	200
Gold	kilograms Rio Narcea Gold Mines Ltd.	Belmonte de Miranda, Asturias	3,750
Iron ore	Compañía Andaluza de Minas S.A. (Mokta, 62%)	Mine at Alquife, Granada (closed 2000)	4,000
Lead:			
Metal	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
Ore	Sociedad Minera y Metalúrgica de Peñarroya de España S.A. (Peñarroya S.A., France, 90%)	Opencast mine at Montos de Los Azules	25
Do.	Andaluza de Piritas S.A.	Mine at Aznalcollar (closed 2001)	21
Do.	Exploración Minera Internacional España S.A. (EXMINESA)	Underground mine at Rubiales, Lugo	16
Magnesite	Magnesitas de Rubián S.A.	Plants at Zubiri	100
Do.	do.	Mines and plant near Sarria, south of Lugo	220
Mercury	flasks Minas de Almadén y Arrayanes S.A. (Government, 100%)	Mines (closed) and smelter at Almadén	70,000

TABLE 5--Continued
 SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(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.	Refineries at Escombreras	200,000
Do.	do.	do.	Puertollano	14,000
Do.	do.	do.	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)	Refinery at Santa Cruz de Tenerife	160,000
Do.	do.	Petroleos del Mediterraneo S.A. (Petromed)	Refinery at Castellon de la Plana	120,000
Do.	do.	Compañía Iberica Refinadora de Petróleos S.A. (Petroliber)	Refinery at La Coruna	140,000
Potash, ore		Iberpotash S.A. (Dead Sea Works Ltd., 100%)	Mines and plants at Suria, near Barcelona	850
Pyrite		Compañía Española de Mines de Tharsis	Mines and plants at Tharsis and Zarza, near Seville	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		Tolsa S.A.	Mine and plant at Vicalvaro, near Madrid	100
Do.		Silicatos-Anglo-Ingleses S.A.	Mine and plant at Vilecas, near Madrid	200
Soda ash		Solvay S.A.	Plant at Torrelavega	150
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
Strontium		Solvay Minerales S.A.	Mines and plant at Escuzar, Granada	85
Do.		Canteras Industriales 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		Asturiana de Zinc S.A. (Azsa), (Glencore International AG, 44%)	Electrolytic zinc plant at San Juan de Nieva	480
Do.		Española del Zinc S.A.	Electrolytic plant at Cartagena	50
Ore		Asturiana de Zinc S.A. (Azsa), (Glencore International AG, 44%)	Reocin mines and plants near Torrelavega, Santander	500
Do.		Boliden Apirsa S.A. (Boliden Ltd., 100%)	Los Frailes Mine (closed 2001)	3,500
Do.		Exploración Minera Internacional España S.A. (EXMINE S.A.)	Underground mine at Rubiales, Lugo	500
Do.		Sociedad Minera y Metalúrgica de Penarroja-Espana S.A.	Mines and plants at Montos de los Azules y Sierra de Lujar, San Agustin	200