

# SPAIN

By Harold R. Newman

Spain, which has some of the most mineralized territory in Western Europe, 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 a long history of base-metal mining, and although the number of active operations has halved in recent years, with copper production a notable casualty, the country remained an important lead and zinc producer (table 1).

Spain's economy continued to perform well. The Government estimated a 3.2% gross domestic product growth for 2001. Much of Spain's economic policy had focused on meeting the macroeconomic objectives of the Maastrich Treaty of 1992 so that it could become one of the founding members of the European Monetary Union (EMU). Spain's economic progress resulted in its qualification to enter the EMU in May 1998. In 2001, the economy continued to fall within the Maastrich guidelines with an inflation rate of 4%, an interest rate of 5.56%, and a Government deficit of 0.3% (U.S. Department of Commerce, 2002§<sup>1</sup>).

## Government Policies and Programs

Legislation aimed at abolishing state and private monopolies passed in midyear 2000, and the Government was continuing with its program of liberalization of the Spanish industry in 2001. Electricity markets, natural gas, and petroleum were the key targets in the liberalization efforts (U.S. Energy Information Administration, 2002§).

## Environmental Issues

Environmental issues in Spain include air pollution, deforestation, desertification, and pollution of the Mediterranean Sea from raw sewage and effluents from the offshore production of natural gas and petroleum. Environmental regulation bodies for Spain include 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, Toxic and Dangerous Waste, Notification of New Substances, and General Order on Health and Safety at Work. Most of Spain's environmental agenda and pace were determined by the EU because of the need to implement the ever-growing body of EU environmental legislation (Worldinfozone, 2001§).

<sup>1</sup>References that include a section twist (§) are found in the Internet References Cited section.

Clean-water projects and sewerage treatment projects continue to receive priority status. The availability of funding for remedial action to recover contaminated sites throughout Spain is limited when compared with the needs. Nevertheless, a significant amount of funding by the EU has been committed to recover various sites throughout Spain contaminated by mining, mineral processing, and other activities. Other member countries were also receiving funding for remedial work to correct environmental problems (Environmental Reports, 2001§).

## Production

Production exceeded domestic consumption for most nonmetallic minerals, thus leaving surpluses for export. With a few exceptions, mine production continued at about the same level or lower as that of 2000. Of the major metals, production of mined lead increased, and that of mined zinc decreased. Production of copper and silver decreased, and cadmium metal production and iron ore mining ceased altogether. Total refined copper production and secondary lead metal output decreased. Primary aluminum metal production increased. The mercury mines at Almadén continued to produce at levels in accordance with market demand.

Quarried mineral products, particularly quarried stone, accounted for a significant share of the value of all mineral production in Spain. In mineral fuels and related materials, natural gas output and petroleum output remained about the same. Spain's production of crude oil was limited, and the country continued to be a large importer of mineral fuels (table 1).

## Trade

Spain's international economic profile has grown appreciably in recent years. Spain is the world's 16th largest exporting country. Principal export markets are the EU, the major Latin American economies, and the United States. The primary sources for Spain's imports are the EU, the United States, the Organization of the Petroleum Exporting Countries (for crude oil), Latin American countries, and Japan. The EU accounts for about 70% of Spain's exports and for about 65% of imports (Australian Department of Foreign Affairs and Trade, 2001§).

Spain has eliminated tariff barriers for imports from other EU countries and applies common EU external tariffs to imports from non-EU countries. Similarly, Spain follows the United States-EU mutual recognition agreements in its application of nontariff regulations and conformity assessment procedures applied to certain goods from the United States (U.S. Department of State, 2001).

Spain's exports to and imports from the United States decreased by about 9% in 2001, which resulted in a trade balance of \$559 million (tables 2, 3).

## Structure of the Mineral Industry

The mineral industry comprised a mix of state, state and privately owned, and privately owned companies (table 4). 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, govern the mineral industry. The General Directorate of Energy Policy and Mines, which is under the Ministry of Economy, implements these mineral laws. Sociedad Estatal de Participaciones Industriales (SEPI) and the Instituto Geológico y Minero are the principal Government mineral-resource agencies. Also, some of Spain's regional governments, such as Andalusia, Asturias, and Catalonia, have interests in the development of mineral resources in their territory.

## 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 located near San Ciprián) 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.

From January to September 2000 (the latest date for which data were available), Spanish imports of aluminum waste and scrap rose to 39,923 metric tons (t) compared with 38,229 t during the same period in 1999. The United States which was the principal supplier, provided 30,637 t. Spanish export of aluminum scrap totaled 26,096 t from January to September 2000 compared with 12,826 t during the same period 1999 (Metal Bulletin, 2001g).

**Copper.**—MK Gold Co. was continuing efforts to permit its Las Cruces copper mining project, which is located in southwestern Spain. Bechtel International Inc. completed the feasibility study in March 2001. On the basis of the feasibility study, MK Gold estimated that the capital costs to bring the project into commercial production would be about \$290 million; this would include working capital, land purchases and contingencies but exclude interest and other financing costs. A mining concession application was submitted in March 2001. Water permit applications were submitted in April and May 2001 (MK Gold Co., 2001§).

The Las Cruces project will be an open pit mine that will exploit estimated reserves of about 16 million metric tons (Mt) at a grade of 5.94% copper. An average of 1.2 Mt will be mined and processed annually for more than 13 years; this will result in a projected total production of 834,000 t of cathode copper. The plant could produce 72,000 metric tons per year (t/yr), although production was expected to average 63,000 t/yr during the life of the mine (Northern Miner, 2001a).

Navan Resources Ltd.'s Aguas Teñidas copper-lead-zinc operations near Huelva were suspended in December, and a creditor protection application, which is similar to a Chapter 11 bankruptcy in the United States, was filed with the Spanish courts. At that time, Navan's shares were suspended from

trading on the Dublin, Ireland, and London, United Kingdom, Stock Exchanges. Navan was believed to be considering options for repayment of about \$35 million in loans extended by the Deutsche Bank of Germany, which was used to finance capital expansion programs at Navan's Spanish operations. Navan recorded a \$21 million net operating loss for 2001 compared with a \$5.5 million loss in 2000. The loss included a full writedown of the company's Spanish assets, which included Aguas Teñidas (Mining Journal, 2001b).

Atlantic Copper S.A. was reported to be considering plans to raise its cathode production by 22% to 320,000 t/yr, its copper rod production by 64% to 240,000 t/yr, and its copper wire output by 212% to 50,000 t/yr. The expansion possibilities were to increase the output of value-added, finished products (Metal Bulletin, 2001c).

**Ferroalloys.**—Ferroatlántica S.A. was the only producer of ferroalloys in Spain. The group has four sites located in Boo, Dumbia, Monzon, and Sabon. Ferroatlántica announced that it was building a 30,000-t/yr ferrosilicon plant at Dumbria at a cost of about \$20 million. Also, the company was planning to expand production of ferromanganese and ferrosilicon at the Boo plant. The plant produces about 140,000 t/yr of ferromanganese, silicomanganese, and ferrosilicon (Metal Bulletin, 2001d).

Between January and March 2001, Spanish imports of ferroalloys were 112,572 t compared with 91,161 t in the corresponding period in 2000. During the same period, exports of ferroalloys were 26,757 t compared with 13,573 t in 2000. The main export destination was the United States, which took 20,912 t of ferrosilicon between January and March 2001 compared with 12,630 t the same period in 2000 (Metal Bulletin, 2001e).

**Gold.**—Rio Narcea Gold Mines Ltd. was a mineral-resource company with operations, development projects, and exploration activities in Spain and Portugal. Rio Narcea produced gold at its El Valle and Carlés Mines and was proceeding with permitting the Corcoesto gold project. Rio Narcea achieved record output of 3,371 kilograms (kg) of gold in 2001; this was a 28% increase compared with that of 2000. El Valle Mine experienced some lower production caused by complex ore with higher-than-expected levels of impurities. Rio Narcea estimated that production in 2002 would be 4950 kg; this would reflect the development of a high-grade ore zone at El Valle Mine (Mining Journal, 2001d).

**Iron Ore.**—A principal producer of iron ore was Compañía Andaluza de Minas S.A. (CAM), which had worked its open pit mine at Alquife (Granada). Mining was halted in October 1996, and resumed and halted a couple of times until the mine was placed on care and maintenance in 2000. The very small amount of iron ore that was produced was for nonmetallic applications. CAM remained inactive at yearend 2001.

**Mercury.**—The Spanish Government transferred its ownership of Minas de Almadén y Arrayanes S.A. (Almadén) in preparation for privatization. Almadén was put under the umbrella of SEPI along with 10 other companies. Any sale would likely be some time in the future. Almadén was the world's largest mercury producer (Metal Bulletin, 2001f).

**Nickel.**—Rio Narcea exercised an option to acquire the Aquablanca nickel, copper, and platinum-group-metals project in Extremadura province. Rio Narcea acquired the project from Atlantic Copper S.A. and the Spanish Government after reviewing available data and performing testing, drilling and geotechnical studies. The mine plan was based on a 10- to 12-year open pit operation that would produce 10,000 t/yr of nickel in concentrate, which would constitute about one-half of the EU's nickel mine production; copper and platinum-group metals would be produced as byproducts. The company planned to carry out a deep drilling program scheduled for completion in early 2002 that would support a bankable feasibility study. If results are positive, then production could begin in 2004. The work program and feasibility study would be funded by a \$4 million debenture arranged with the Deutsche Bank (Northern Miner, 2001b).

The Aquablanca deposit is hosted by mafic cumulates in the Aquablanca stock, which is one of two main intrusions of the Santa Olalla plutonic complex. Mineralization occurs as two elongated subvertical bodies; one contains massive sulfide mineralization, and the other, disseminated sulfides. Sulfides are mainly chalcopyrite, pentlandite, pyrite, and pyrrhotite. Reserves were estimated to be 35 to 40 Mt at 0.6% to 0.7% nickel, 0.5% to 0.6% copper, 0.02% cobalt, 0.3 gram per metric ton (g/t) palladium, 0.3 g/t platinum, and 0.15 g/t gold (Mining Journal, 2001c).

**Steel.**—Spain's largest steelmaker Aceralia S.A. of Spain, Acieries Reunies de Burbach-Eich-Dudelang (ARBED) of Luxembourg, and Usinor Group of France have agreed to merge their businesses and specialities. When the new company is created, the partners will make up the world's largest steel group. It will have the capacity to produce 46 million metric tons per year (Mt/yr) of liquid steel per year, which corresponds to a sales volume of about \$30 billion. Aceralia, ARBED, and Usinor will form a multispecialty group, and the merger would furnish them the means to be stronger in Europe and to develop more rapidly outside of Europe. The new group emerging from the integration 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 (EC) gave permission for the integration in November 2001 (Arcelor, 2001§).

Aceralia will double the steelmaking capacity at Bilbao to 1.8 Mt/yr. The new capacity was scheduled to come onstream in early 2003 with the completion of a second Compact Strip Production (CSP) caster and expanded hot strip mill. SMS Demag of Germany was given the CSP order, which included an equalizing furnace, a seventh stand for the hot mill, and other modernization work. The work was expected to be completed by mid-2003. The mill's two electric arc furnaces have been expanded to double their original 900,000-t/yr capacities (Metal Bulletin, 2001b). Aceralia has other steel plants at Avilés, Gijón, and Zaragoza.

Aceralia was also planning to increase the capacity of its rail mill at the Gijón works. The upgrade would increase the mills capacity to more than 200,000 t/yr from 130,000 t/yr. The rail mill supplied rail for Spain's high-speed train network and also exported rail material to Brazil and Taiwan. In 2000, the company delivered rail lengths of 288 meters to the domestic market (Metal Bulletin, 2001a).

Acerinox S.A. may move some of its production away from Spain to its newly acquired stainless steel 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, the Algeciras works had six power cuts in 2001 that totaled 26 hours. The company said 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 shake-out 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, 2002b).

**Tantalum and Tin.**—Solid Resources Ltd. formed a subsidiary to hold a 60% interest in a tantalum mining venture. Solid Resources acquired 20,500 acres, which covered a number of small former tin mines. Tantalum is often found in conjunction with tin. On the basis of 18 bulk samples collected in a continuous zone by Instituto Geológico y Minero of Spain, 3.5 Mt of ore with an average grade of about 1 kg of tin per metric ton and about 0.1 kg of tantalum per metric ton was estimated to occur in one of the Coto Tocayas deposits. Lithium and niobium were also reported (Solid Resources Ltd., 2001§).

**Tungsten.**—The Austrian integrated tungsten producer Wolfram Bergbau und Hutten GmbH signed a contract to begin scheelite mining in the Castilla y Leon region of Spain. Ore reserves were estimated to be more than 2 Mt with a higher than 0.7% WO<sub>3</sub> content. According to the company's plan, the mine would operate for 4 years as an open pit mine and then be developed as an underground operation. Production was scheduled to be about 800 t/yr of tungsten-in-concentrate. The scheelite concentrate was to be delivered to Wolfram's plant in Bergla, Austria (Metal Bulletin, 2001i).

**Zinc.**—Boliden Apirsa S.A.'s Los Frailes Mine, which was one of the biggest open pit zinc mines in Europe, was closed in early 1998 after a costly tailings dam accident. Mining operations started in mid-1999 after the license and a permit to dump tailings in the Aznalcóllar open pit were granted. The result of a judicial investigation in 2001 indicated that the accident was caused by mistakes in the design of the dam and erroneous conclusions of the geologic studies carried out prior to construction and could not be attributed to Boliden Ltd. or Boliden Apirsa (its subsidiary and the operating company) at Los Frailes (Mining Journal, 2001a).

In keeping with an asset-sale and restructuring program, Boliden and Trafigura AG of Switzerland signed an agreement to negotiate the sale of Los Frailes Mine. Boliden reported an operating loss of \$656 million, which included a writedown of \$210 million for its investment in Los Frailes. Boliden Apirsa closed Los Frailes Mine in October 2001. Trafigura and Murchison United Ltd. of Australia were the only two parties

that expressed an interest in Los Frailes. Trafigura also expressed interest in the forthcoming sale of Minas de Rio Tinto S.A. (Metal Bulletin, 2001h).

Xstrata AG of Switzerland made a takeover offer of \$520 million for Asturiana de Zinc S.A. (Azsa). Xstrata made the takeover offer conditionally upon the receipt of at least 80% of Azsa's shares. Xstrata was basing its zinc strategy on being a low-cost producer and having control of the cash flow through 100% acquisition. A capacity expansion project that was completed in 2001 raised the capacity of Azsa's San Juan de Nieva smelter and refinery to 460,000 t/yr from 320,000 t/yr. This expansion made Azsa the largest zinc smelter in Europe (Metal Bulletin, 2001j).

### **Industrial Minerals**

**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. High freight costs have, however, reduced profitability, so speciality clay producers were tending to concentrate on alternative markets, such as pet litter, foundry, and rheological additives (Grupo Tolsa, 2000§).

**Magnesium Compounds.**—Grecian Magnesite S.A., which was one of the world's leading magnesite producers, and Timab Industries have increased their interest in Magnesitas Navarras S.A. (Magna), which was the largest magnesite producer in Spain, to 97.7%. Magna was a specialist magnesia producer with capacities of 125,000 t/yr of caustic and dead burned magnesia and 40,000 t/yr of refractory mixes. The operation consisted of an open pit mine at Eugui and concentrating and calcining facilities at Zubiri (Industrial Minerals, 2001d).

The mine at Eugui in the Occidental Pyrenees has been active for 40 years. Reserves were estimated to be more than 350 Mt. About 360,000 t/yr has been extracted from the mine, of which 20% has been waste. The material is crushed, ground, concentrated, and then fed into one of two kilns depending on the product to be made. One kiln, at a temperature of 1,200°C, produced calcined caustic magnesia with about 1% magnesium carbonate in the material. The other kiln, at a temperature of 1,700°C, produced dead burned magnesia which is 82% to 90% magnesium oxide (Industrial Minerals, 2001b).

**Soda Ash.**—Solvay S.A., which was the leading sodium carbonate (soda ash) supplier in Europe, stated that it intended to build a new 80,000-t/yr sodium bicarbonate production line at its soda ash plant at Torrelavega. The location, which is close to the port of Santander, provides the possibility of combining sodium bicarbonate exports with high-volume movements of soda ash. The new line will bring the company's total European production of sodium bicarbonate to 450,000 t/yr (Industrial Minerals, 2001c).

**Sulfur.**—Fertiberia S.A. was continuing with the construction of the largest sulfuric acid plant in Europe. The plant, which was located at Huelva, was being built by Lurgi Group of Germany at an estimated cost of about \$28 million. Fertiberia used sulfuric acid to make fertilizers (Industrial Minerals, 2001a).

### **Mineral Fuels**

Spain's largest energy utility Endesa S.A. planned to build five new powerplants from 2001 through 2005; total installed capacity will be 1,823 megawatts (MW). The construction of the plants will help offset the loss of 2,600 MW of capacity as a result of the planned sale of its Electrica Viesgo unit. Four of the plants will be built on the mainland—Barcelona, Cadiz, Huelva, and Tarragona; the fifth will be built on the Balearic Islands. By 2007, Endesa expected to have a total of 3,200 MW of installed capacity that uses combined-cycle gas-powered generating technology (Alexander's Gas and Oil Connections, 2001b§).

Spain has partially liberalized its power market and brought forward the date for full competition to 2003, which is 4 years earlier than previously scheduled. Spain's competition court recommended approval of the merger of electric companies Endesa and Spain's second largest energy utility Iberdrola S.A. under strict conditions. The two companies controlled 80% of Spain's power distribution. The new company could not have more than the 41% market share held by Endesa in 2000 (Alexander's Gas and Oil Connections, 2001c§).

Repsol YPF S.A. had formerly requested the competition tribunal to rule against the proposed merger of Endesa and Iberdrola. Repsol stated that the \$14.3 billion merger should be blocked because it would create a de facto electricity monopoly. The prospects of having to meet stringent antitrust conditions by significant disposals of subsidiaries have prompted Endesa and Iberdrola to express concern that the link-up may not be viable (Burns, 2001).

**Coal.**—Spain, which was one of the larger coal producers in the EU, had an output of almost 23 Mt in all types of coal in 2001. Coal reserves were abundant but difficult to mine. Consequently, the cost of production was high, 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.

The EU required that mining subsidies be phased out; it can, however, authorize payments where aid can be shown to be assisting in the restructuring of an industry that might falter without public money. Although coal was Spain's most plentiful indigenous energy source, it was too expensive to extract to be competitive in a free-energy market. The EC accepted the particular problems that faced the coal sector and consequently allowed the financing of some operational aid as well as structural reforms. The EC authorized the Government to grant aid of up to about \$1 billion in 2001. The EC authorized operating aid of \$275 million for 42 mines that collectively produced 10.7 Mt/yr; structural aid of \$350 million for rationalizing 14 mines that collectively produced 3.2 Mt/yr; welfare payments of \$358 million for around 13,000 workers who were taking early retirement; and special technical grants of \$87 million to cover one-off costs of closing mines (Mining Journal, 2002).

**Natural Gas.**—Compañía Española de Petróleos S.A. (Cepsa) reported that the EC had cleared the merger of Cepsa Gas Commercializadora and TotalFinaElf Gas and Power España. The merger of the two companies natural gas operations was

approved under the EC's simplified procedure which clears uncontroversial mergers or joint ventures automatically after 1 month if no objections are raised by third parties. Cepsa Gas will adsorb 100% of TotalFinaElf Gas and Power and TotalFinaElf will buy 50% of Cepsa Gas (Alexander's Gas and Oil Connections, 2001a§).

**Petroleum.**—Repsol YPF S.A. discovered two new crude oil reservoirs offshore southern Spain in the Mediterranean Sea. The discoveries, named Necora 1 and Bocarte 1, will provide flows of up to 5,000 barrels per day (bbl/d) oil and mark another successful stage in the company's Tridente exploration program. The largest well in the area, Chipiron, was flowing 4,000 bbl/d of oil. The discoveries were expected to be tied back 11 kilometers to the Casablanca platform, which was producing 7,500 bbl/d of oil from the Baracuda, Boqueron, Casablanca, Chipiron, and Rodaballo fields (Cross, 2001).

**Renewable Energy.**—Spain has distinguished itself as a world leader in the use of different types of renewable energy. The country placed strong emphasis on hydroelectricity and had plans for 150 wind farms to add to its existing 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 generated 41% of its product from renewable sources, mainly hydropower (Alexander's Gas and Oil Connections, 2001a§).

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## Major Sources of Information

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TABLE 1  
SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1997	1998	1999	2,000	2001 e/
<b>METALS</b>					
Aluminum:					
Alumina 2/	1,110,300	1,100,000	1,100,000 e/	1,200,000 e/	1,100,000
Metal:					
Primary	359,904	361,900	363,900	365,700	376,400 3/
Secondary	153,800	154,000	224,000	240,520	221,720 3/
Cadmium metal	301	196	--	--	--
Copper:					
Mine output, Cu content	37,833	37,002 r/	1,738 r/	23,312	9,700
Metal:					
Blister:					
Primary	288,900	304,330	292,800 r/	289,900	279,900 3/
Secondary e/	23,800	30,000	25,000 r/	25,000	24,700 3/
Total	312,700	334,330	317,800 r/	314,900	304,600 3/
Refined:					
Primary	229,000	239,600	250,756	258,000	235,100 3/
Secondary e/	63,300	64,700	65,000	58,000	55,600 3/
Total	292,000 e/	304,330	315,756	316,000	290,700 3/
Germanium oxide, Ge content e/ kilograms	6,500 3/	6,500	6,000	6,000	6,000
Gold, mine output, Au content do.	1,824	3,295	5,018	4,310	3,720 3/
Iron and steel:					
Iron ore and concentrates, Fe content thousand tons	58	--	--	--	--
Metal:					
Pig iron do.	3,926	4,235	4,146	4,059	4,094 3/
Ferrous alloys, electric furnace do.	208 r/	190 r/ e/	179 r/	180 r/	180
Ferrochromium, crushed e/	1,000	1,000	1,000	950 3/	--
Steel, crude thousand tons	13,644	14,827	14,886	15,844	15,834 3/
Steel, hot rolled do.	12,421	13,259	13,846	14,599	14,931 3/
Lead:					
Mine output, Pb content	23,900	21,900 r/	41,800 r/	40,300 r/	49,500 3/
Metal, secondary e/	74,900	90,000	96,000	120,000	121,600 3/
Mercury, metal thousand tons	4	7	4	9	8 3/
Silver, mine output, Ag content kilograms	66,000	47,000	96,000	83,000 r/	60,000
Tin, mine output, Sn content e/	2,000	2,000	2,000	1,819 r/	708 3/
Titanium dioxide e/	18,000	16,000	16,000	-- r/	-- 3/
Uranium, mine output, U <sub>3</sub> O <sub>8</sub> content thousand tons	425	335	362	623	645 3/
Zinc:					
Mine output, Zn content	171,800	128,100	154,062 r/	201,300 r/	164,900 3/
Metal, primary and secondary	364,200	358,300	393,000 r/	387,100 r/	436,800 3/
<b>INDUSTRIAL MINERALS</b>					
Barite, BaSO <sub>4</sub>	90,000	70,000	62,000	32,653 r/	44,000
Bromine e/	100	100	100	--	--
Calcium carbonate e/	1,750	1,880	1,950	2,000	2,000
Cement, hydraulic, other than natural thousand tons	27,632	27,943	35,830 r/	38,154 r/	40,512 3/
Clays:					
Attapulgit e/	125,000	130,000	130,000	28,307	24,477 3/
Bentonite e/	170,000	193,000 3/	190,000	90,152	90,000
Kaolin, washed	296,000	310,000	320,000	353,355	400,000
Other e/ thousand tons	20,000	20,000	15,000	15,000	15,000
Diatomite and tripoli e/	36,000	56,000	55,000	66,770 r/	57,000
Feldspar	398,000	430,000	450,000	478,260 r/	600,000
Fluorspar, CaF <sub>2</sub> content					
Acid-grade	110,000 e/	110,000 e/	133,000	132,690 r/	126,535 3/
Metallurgical-grade	10,000 e/	14,000 e/	9,000	7,776 r/	7,504 3/
Total	120,000 e/	124,000 e/	142,000	140,466 r/	134,039 3/
Gypsum and anhydrite, crude thousand tons	8,300	7,500	9,450	9,929 r/	10,900
Kyanite, andalusite, related materials e/	2,500 3/	2,500	2,500	-- r/	--
Lime, hydrated and quicklime e/ thousand tons	1,500	1,500	1,500	1,500	1,500
Magnesite, calcined	171,000	201,000	211,000	160,000 r/	156,000 3/
Mica e/	2,500 3/	2,500	2,500	10,086 r/	10,000
Nitrogen, N content of ammonia thousand tons	497	460 e/	437	442	436 3/

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	1997	1998	1999	2000	2001 e/
<b>INDUSTRIAL MINERALS--Continued</b>					
Pigments, mineral: e/					
Ocher thousand tons	80	70	70	87 3/	87
Red iron oxide	15,000	15,000	15,000	-- r/	-- 3/
Potash, K <sub>2</sub> O equivalent	639,000	597,000	549,000 r/	646,294 r/	569,127 3/
Pumice e/	600,000	600,000	600,000	761,540 3/	770,000
Pyrite, including cuprous, gross weight thousand tons	993	868	733	205 r/	152 3/
Salt:					
Rock, including byproduct from potash works do.	2,200 e/	2,200	2,200	2,328 r/	2,500
Marine and other do.	1,400 e/	1,200	1,400	1,541 r/	1,600
Sand and gravel, silica sand e/ 4/ do.	58,000	62,000	65,000	86,321 r/	95,000
Sepiolite, meerschaum	695,000	750,000	800,000	794,114 r/	896,983 3/
Sodium compounds, n.e.s.:					
Soda ash, manufactured e/ thousand tons	500	500	500	500	500
Sulfate, natural: e/					
Glauberite, Na <sub>2</sub> SO <sub>4</sub> content	650,000	650,000	675,000	669,256 3/	705,000
Thenardite, Na <sub>2</sub> SO <sub>4</sub> content	180,000	180,000	200,000 3/	167,800 3/	168,000
Manufactured	125,000	125,000	125,000	125,000	125,000
Stone: e/					
Chalk thousand tons	140	136	136	889 3/	980
Dolomite do.	5,400	5,000	9,080	8,752 3/	9,628 3/
Limestone do.	2,500	2,200	2,200	193,450 3/	2,500
Marble, ornamental do.	2,400	2,400	3,850	3,687 3/	4,100
Marl do.	8,950	9,845 3/	10,030	9,966 3/	10,495 3/
Basalt do.	1,400	1,000	1,000	3,044 3/	3,348 3/
Granite, ornamental do.	1,400	1,400	1,750	1,188 3/	1,200
Ophite do.	2,200	2,000	2,000	2,579 3/	2,840 3/
Phonolite do.	650	650	650	1,479 3/	1,630 3/
Porphyry do.	800	1,000	1,000	2,159 3/	2,483 3/
Quartz do.	1,520	1,500	1,720	1,961 3/	2,150 3/
Quartzite do.	2,400	2,000	2,200	2,131 3/	2,150 3/
Sandstone do.	2,500	2,500	2,500	2,318 3/	2,430 3/
Serpentine do.	900	1,000	1,000	794 3/	897 3/
Slate do.	555	615 3/	600	751 3/	790
Other do.	1,000	1,000	1,000	1,000	1,000
Strontium minerals, Sr <sub>2</sub> O <sub>4</sub> content	92,000 e/	111,000	128,000 r/	148,352 r/	143,320 3/
Sulfur:					
S content of pyrites thousand tons	480	430	388	94 r/	71 3/
Byproduct: e/					
Of metallurgy do.	250	461	455	454	461 3/
Of petroleum do.	150	100	110	115	135 3/
Of coal (lignite) gasification do.	2	1	1	1	1
Total sulfur do.	882	992	954	708 r/	667 3/
Talc and steatite e/	110,000	110,000	111,000 3/	114,654 r/	115,000
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Coal (marketable):					
Anthracite thousand tons	6,678	6,393	5,436	4,651	4,694 3/
Bituminous do.	7,200 e/	6,004	6,828	6,173	5,797 3/
Lignite (black and brown) do.	12,577	13,675	12,535	12,153	12,193 3/
Total do.	26,455	26,072	24,253	23,485	22,684 3/
Coke, metallurgical do.	2,622	2,649	2,332	2,470	2,400
Gas, natural (marketed) million cubic meters	178	114	143	179	180
Peat e/	60,000	50,000	50,000	50,000	50,000
Petroleum:					
Crude thousand 42-gallon barrels	2,850	4,013	2,295	1,648 r/	2,505 3/
Refinery products:					
Liquefied petroleum gas do.	18,954	18,096	18,000	18,000 e/	18,000
Naphtha do.	22,899	24,990	25,000	25,000 e/	2,500
Gasoline, motor do.	78,497	84,405	85,000	85,000 e/	85,000
Jet fuel do.	33,000	36,000	36,000	36,000 e/	36,000
Kerosene do.	20,000	30,000	30,000	30,000 e/	30,000
Distillate fuel oil do.	138,249	148,969	150,000	150,000 e/	150,000

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	1997	1998	1999	2000	2001 e/	
MINERAL FUELS AND RELATED MATERIALS--Continued						
Petroleum--Continued:						
Refinery products--Continued:						
Residual fuel oil	thousand 42-gallon barrels	77,276	86,407	85,000	85,000 e/	85,000
Other e/	do.	35,500	37,400	38,000	38,000	38,000
Refinery fuel and losses e/	do.	12,000	10,000	10,000	10,000	10,000
Total e/	do.	436,000	476,000	477,000	477,000	477,000

e/ Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. r/ Revised. -- Zero.

1/ Table includes data available through June 2002.

2/ Reflects aluminum hydrate.

3/ Reported figure.

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

TABLE 2  
 SPAIN: EXPORT AND IMPORT TRADE  
 WITH THE UNITED STATES IN 2001

(Million dollars)

Month	Exports	Imports
January	459	542
February	530	417
March	617	425
April	420	436
May	491	476
June	505	454
July	314	414
August	428	433
September	489	359
October	525	426
November	522	422
December	455	394
Total	5,756	5,197

Source: U.S. Census Bureau, Foreign Trade Division, July 2002.

TABLE 3  
 SPAIN: TRADE BALANCE WITH THE UNITED STATES

(Million dollars)

Year	Exports	Imports	Trade balance
1997	5,539	4,606	933
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

Source: U.S. Census Bureau, Foreign Trade Division, July 2002.



TABLE 4  
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2001

(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 S.A.)	Alumina plant at San Ciprián, Lugo	1,000
Aluminum	Aluminio Español S.A. (Alcoa Inespal S.A.)	Electrolytic plant at San Ciprián, Lugo	180
Do.	Industria Española del Aluminio, S.A. (Alcoa Inespal)	Electrolytic plant at Avilés	100
Do.	do.	Electrolytic plant at La Coruña	25
Barite	Minas de Baritina S.A. (Kali-Chemie of Germany, 100%)	Mine and plant in Espiel area, Córdoba	50
Bentonite	Tolsa S.A.	Mine and plant at Vicalvaro, near Madrid	200
Cement	Approximately 36 cement companies, the largest of which was:	54 plants, including:	44,000
Do.	Asland S.A.	Five plants, of which the largest ones are:	(6,000)
Do.	do.	Plant at Puerto de Sagunto, Valencia,	(2,000)
Do.	do.	Plant at Villaluenga de la Sagra, Toledo	(2,000)
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 León	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	Atlantic Copper S.A. (Freeport MacMoRan Inc., 65%; Ercros Group, 35%)	Electrolytic refinery at Huelva	290
Do.	do.	Smelter at Huelva	270
Do.	Elmet SL	Electrolytic refinery at Berango	36
Do.	do.	Smelter at Berango	24
Ore, metal content	Atlantic Copper S.A. (Freeport MacMoRan Inc., 65%; Ercros Group, 35%)	Mines and plant at Ariertero, near Santiago de Compostela, Corta Atalay open-pit mine, and Cerro Colorado open-pit mine in Rio Tinto area	12
Do.	do.	Alfredo underground mine in Rio Tinto area	30
Do.	Navan Resources Ltd.	Sotiel area	6
Dunite	Pasek España S.A.	Mines and plant at Landoy, Ortigueira	1,500
Ferroalloys	Ferroatlantica S.A.	Plants at Boo, Dumbria, Monzon, and Sabon	200
Fluorspar, ore	Fluoruros S.A. (Bethelhem Steel Corp., 49%)	Plant at Caravia, near Colunga	400
Do.	do.	Opencast mines in Asturias at San Lino and Val Negro and underground mine at Eduardo, near Carav	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 Corp., 62%)	Mine at Alquife, Granada (closed; maintenance status)	4,000
Lead:			
Metal	Española del Zinc S.A.	Smelter at Cartagena, Murcia	60
Do.	do.	Refinery at Cartagena, Murcia	60
Do.	Compañía La Cruz, Minas y Fundaciones de Plomo S.A.	Smelter at Lineares, Jaén	40
Do.	do.	Refinery at Lineares, Jaén	40
Do.	Tudor S.A.	Secondary smelter at Zaragoza	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	Andaluza de Piritas S.A. (APIRSA)	Opencast mine at Aznalcóllar, Sevilla	21
Do.	Exploración Minera Internacional España S.A. (EXMINESA)	Underground mine at Rubiales, Lugo	16
Limestone	Calcinor S.A.	Mines at Aizkibel, Calcasa, Dobusa and Tolosa	2,500
Magnesite	Magnesitas Navarras S.A. (Grecian Magnesite S.A., 99.7%)	Mine at Eugui, Plant at Zubiri	125
Do.	Magnesitas de Rubián S.A.	Mine and plant near Sarria, south of Lugo	75
Mercury flasks	Minas de Almadén y Arrayanes S.A. (Sociedad Estatal de Participaciones Industriales, 100%)	Mines and smelter at Almadén	70,000
Nitrogen, N content of ammonia	Fertiberia S.A.	Plant at Frontera	415
Petroleum:			
Crude barrels per day	Chevron S.A.	Oilfield at Casablanca	300

TABLE 4--Continued  
 SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2001

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum--Continued:				
Refined	barrels per day	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 Castellón de la Plana	120,000
Do.	do.	Compañía Iberica Refinadora de Petróleos S.A. (Petroliber)	Refinery at La Coruña	140,000
Potash, ore		Iberpotash S.A. (Dead Sea Works Ltd., 60%; La Seda S.A., 20%; Tolsa S.A., 20%)	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%; Rio Tinto Zinc, 25%)	Mines and plant at Rio Tinto, near Seville	900
Sepiolite		Tolsa S.A.	Mine and plant at Vicalvaro, near Madrid	600
Do.		Minería y Tecnología de Arcillas S.A.	Mine and plant at Zaragoza	125
Sodium bicarbonate		Solvay S.A.	Plant at Torrelavega	80
Sodium sulfate, natural		Crimidesa S.A.	Mine and plant at Cerezo de Rio, Burgos	600
Do.		Minera de Santa Marta S.A.	Mine and plant at Belorado, Burgos	250
Steel		Aceralia S.A.	Plants at Avilés, Bilbao, Gijón, Sagunto, and Sestao	8,000
Do.		Celsa Group	Plant at Barcelona	2,600
Do.		Acerinox S.A.	Plants at Algeciras and Palmonos	1,000
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 <sub>3</sub> O <sub>8</sub>	metric tons	Empresa Nacional del Uranio (Enusa) (Government, 100%)	Mines and plant near Ciudad Real	500
Zinc:				
Metal		Asturiana de Zinc S.A. (Xstrata AG)	Electrolytic zinc plant at San Juan de Nieva	460
Do.		Española del Zinc S.A.	Electrolytic zinc plant at Cartagena	68
Ore		Asturiana de Zinc S.A. (Xstrata AG)	Reocin mines and plants near Torrelavega, Santander	500
Do.		Boliden Apirsa S.A. (Boliden Ltd., 100%)	Los Frailes Mine at Aznalcóllar	3,500
Do.		Exploración Minera Internacional España S.A. (EXMINE S.A.)	Underground mine at Rubiales, Lugo	500