THE MINERAL INDUSTRY OF

SPAIN

By Harold R. Newman [1]

Spain, whose land area includes a major portion of the Iberian Peninsula, is one of the most mineralized areas in Western Europe. The area is geologically very complex, and this increases its potential for mineral resources. The Iberian Pyrite Belt is within the southwestern part of the Iberian Peninsula, covers an area 230 kilometers (km) long and an average of 30 km in width, and trends in an east-west direction from the Portuguese coast near Setubal to the Guadalquivir River near Seville, Spain. This area is considered the most significant mining district within the European Union (EU) and is an important source of nonferrous and precious metals. The main polymetallic deposits from west to east are Aljustrel and Neves-Corvo in Portugal, and Tharsis, Scotiel, Rio Tinto, and Aznalcollar in Spain.

The Iberian Peninsula has a diverse mining history that dates to Phoenician times. Since then, there have been exploitations to extract a wide range of minerals. However, it was not until the middle of the 19th century that intense mining activities were initiated, primarily owing to the influx of English and French foreign capital.

Although Spain has a great diversity of deposits both in metallic and industrial minerals and in coal, the majority of mining sectors are barely active. There are very few large mines, and mining activity is maintaining the downward trend of previous years. Because of the diversity of the country's mineral deposits, this trend could be reversed in the future. There is an appreciable amount of exploration being carried out in various parts of the country.

Government Policies and Programs

The Government fostered economic growth, but had to rationalize some of the Government-controlled industries. The coal and steel industries had to reduce production capacity in accordance with Spain's acceptance into the EU. The resulting loss of jobs increased the rate of unemployment, which was already higher than the EU average unemployment rate. Unemployment at yearend was estimated to be about 23% of the working population.

Investment-led economic growth has provided some relief to the unemployment problem. During the past 5 years, Spain has enjoyed one of the higher investment-led output growth rates in the Organization for Economic Cooperation and Development (OECD) countries. Spain had a gross domestic product increase of 2.8% in 1994.

The Government continued consultations to improve relationships with labor and business in an attempt to maintain a competitive advantage and to control inflation. The Government saw challenges to competitive advantage if inflation and wages were not managed and market-oriented reforms were not continued.

Because of a very high oil dependency ratio, energy supply was a high priority of the Government. The 1990-95 National Energy Plan (PEN) sought to reduce this ratio by shifting to natural gas and using renewable sources of energy more intensively. Five new coal-fired powerplants were scheduled to be built and expected to use imported coal.

Production

The mineral industry operated in numerous regions throughout the country. The estimated value of Spanish mineral production in 1991, the latest year that full data were available, was about $374,000 million.[2] Fifty percent of this value was attributed to the mineral fuels sector; 10% to the metals sector; and 40% to the industrial minerals sector, including ornamental stone. The number of persons employed in the minerals resource sector in 1992, the latest date data were available, was reported to be 67,000.

Within the EU, Spain was the largest producer of mined lead and zinc and a major producer of pyrites; it also had the highest level of self-sufficiency with respect to mineral raw materials. However, the majority of mining sectors were in crisis. The mercury mines at Almadén, after a long tradition in the history of mining in Spain, were closing. The output of lead, zinc, and copper ores, that were important to the Spanish economy in the past, were reduced.

The industrial growth in the EU contributed to the demand for quarried mineral products from Spain. Quarried natural stone accounted for 16% of the value of Spanish mining. With the exception of coal, it was the most important mining sector in dollar value in the country. *(See table 1.)*

Trade

Liberalization of foreign trade flows proceeded quickly after Spain entered the EU. More than 50% of the differences between Spanish tariffs and EU Common Market external tariffs had been removed, with complete elimination planned

by 1995. Table 2 shows the impact of selected classes of mineral commodities on Spain's balance of payments position in relation to the EU and the world. *(See table 2.)*

Spain was a large importer of mineral fuels, and it was expected that this situation would continue as the demand for energy increased. About 15% of consumption was satisfied by imported coal. Spain received about 80% of its gas supplies from Algeria and Libya, with the remaining supply provided from domestic production.

Structure of the Mineral Industry

The mineral industry was composed of state and privately owned entities. Minerals belonged to the state under an arrangement known as the "Regalian Principal." The Mining Law of July 19, 1944, as amended, and the Hydrocarbon Law of December 26, 1950, as amended, governed the mineral industry. The Ministry of Industry and Energy implemented the mineral laws, regulated the private sector, and managed most of the state-owned companies through the Instituto Nacional de Industria (INI), a state holding company. INI and Instituto Geologico y Minero (IGM) were the principal Government mineral resource agencies. *(See table 3.)*

Commodity Review

Metals

Aluminum.—Alumina and primary aluminum were produced almost entirely by the Industria Espanola del Aluminio S.A. (Inespal) Group. INI was Inespal's major shareholder. Alumina Espanola S.A., a subsidiary near San Ciprian, produced alumina, primary aluminum in standard sheets and ingots, and special alloys. Inespal was to be reformed into a new holding company with four operating subsidiaries: Aluminio Espanol, Inespal Extrusion, Inespal Conversion, and Inespal Productos Planos.

Difficult times continued for Inespal because of increased electricity costs, increases in Spain's interest rates, and weak world aluminum prices. Owing to the prolonged situation, the company announced it was considering reducing production and dividing the cutback equally between the Avilès and La Coruña plants. The company also asked for a reduction in its current electricity tariff of $0.06 per kilowatt-hour.

Industria Navarra del Aluminio (Inasa), a 77% owned subsidiary of U.S.-based Reynolds International Inc., completed a $25 million expansion of its aluminum foil operation at its Pamplona plant. This expansion raises Inasa's foil capacity to 18,600 metric tons per year (mt/a).

Copper.—Rio Tinto Minera S.A. (RTM) operated a smelter and refinery at Huelva with a capacity of 150,000 mt/a of copper, 150 mt/a of refined silver, and 5 mt/a of gold. The copper smelter was the second largest in Europe, and the complex was the only one in Spain that both transformed copper ore into raw copper and then refined the copper in an electrolysis plant.

RTM, a subsidiary of Freeport-McMoran Copper and Gold Inc. of the United States, was undertaking a two-phase expansion of the Huelva complex. The first phase would be an expansion of capacity from the current 150,000 mt/a to 180,000 mt/a of metal production to be completed by mid-1995. The second phase would further increase capacity to 270,000 mt/a. The refinery also would be expanded to increase the production of copper cathodes from 135,000 mt/a to 215,000 mt/a. The overall smelter and refinery expansions were scheduled to be completed in 1996 at an estimated cost of $215 million.

Almagrera S.A. announced the development of an open pit copper mine in the province of Huelva. Reserves were estimated by the company to be 5 million metric tons (Mmt) of ore averaging 3% copper with byproduct zinc. The project, consisting of the mine, equipment, access roads, and processing plant, was estimated to cost $22 million.

The company reported extraction of 50,000 metric tons (mt) at the Migollas Mine; its concentration plant came on-stream in November 1994. Almagera also announced that, from 1995 onward, it planned to produce 350,000 mt/a of complex ores and 400,00 mt/a of copper bearing ores from its combined operations at Migollas and Sotiel Mines.

Gold.—Navan Resources PLC of Ireland and Tolsa S.A. of Spain were a joint-venture gold exploration project in the Almería Province of southern Spain. Navan, with 80% interest, was participating as operator in the exploration of a 150-square- kilometer area. RTM was carrying out exploration work in Huelva and Badajoz. Also, Concorde Minera S.A. was conducting investigations in the province of Almería on the Nijar reserve, on behalf of the state. Concorde was also carrying out exploratory work in the Asturias area.

Iron Ore.—Compañia Andaluza de Minas S.A. (CAM) was the largest iron ore producer in Spain. In addition to an open pit mine that produced about 3.3 million metric tons per year (Mmt/a) from the Alquife deposit on the north side of the Sierra Nevada, approximately 80 kilometers (km) from Granada, CAM operated a 90,000-dead-weight-ton (dwt)-capacity shiploader at the Port of Almeira. CAM continued with a drilling program on its Calahora deposit, about 3 km from the current mine site. If sufficient reserves were defined, CAM was expected to start exploiting the deposit in the late 1990's. Iron ore mining in Spain was located almost totally at Alquife.

Iron and Steel.—The Spanish steel industry maintained its efforts to adapt to the economic environment and realities of the Common Market in Europe. The industry was completely integrated into the EU except for some issues such as residual tariffs and an EU Commission request for a reduction in steelmaking capacity.

Corporacion de la Siderurgia Integral (CSI) and Sidenor were the 2 state companies that produced 50% of the country's steel, while 13 compnaies were in the private sector. A majority of these were scrap-based minimills. CSI was composed of Spain's two largest integrated steel producers, Empresa Nacional Siderurgical S.A. (Ensidesa) and Altos Hornos de Vizcaya (AVH). CSI was charged with developing the future strategy of the two companies to reduce production costs and improve productivity.

CIS has proposed setting up a public holding company, Corporacion V de Productos Siderurgicos Largos Plano y Transformas S.A., under which Ensidesa and AVH would be grouped. Production was intended to be grouped under separate divisions for flat products, long products, and processing. This restructuring effort was expected to reduce Spanish steel capacity by 1.3 Mmt with 10,000 jobs expected to be lost.

Lead.—Sociedad Minera y Metlúrgica de Peñarroya España S.A. closed its 90,000-mt/a primary lead smelter at Cartagena, and the company filed for temporary receivership. The country went from being self-sufficient in primary lead a few years ago to having no primary lead refining capacity. However, secondary lead production had risen significantly and began satisfying more than 50% of domestic consumption needs.

Outokumpu Minera Española S.A. was doing exploration work on lead and zinc in the Cantabria, León, and Huelva areas. Also, Austriana de Zinc, at Reocín, and Navan Ltd., at Mazarrón, were carrying out investigations.

Mercury.—Spain was the only mercury producer in the EU in 1994. Work continued on Minas de Almaden y Arrayanes S.A.'s (MAYASA) Las Cuvas Mine at Almaden, in southern Spain. The new mine, expected to begin limited production in 1995, contained estimated reserves of 140,000 mt of ore at a grade of 5% mercury.

The world's oversupply of mercury during the year hurt the profitability of mercury producers. The drop in mercury sales and prices continued to aggravate MAYASA's economic problems at its mines. MAYASA was reported to have stopped almost all production and was selling most requirements from stockpiled material.

Zinc.—Asturiana de Zinc S.A. was the largest refined zinc producer in the EU and accounted for approximately 4% of the world's zinc production. Asturiana's San Juan de Niva smelter had a capacity of 320,000 mt/a. The company's Reocin Mine and Exminesa's Rubiales Mine supplied most of feed concentrates.

The other supply source, Curragh Resources's Sa Dena Hes Mine in Canada, ceased when that mine stopped production. Austuriana announced that, as a result of the difficult concentrate supply situation, it would cut its 1994 zinc production by 70,000 tons. Asturiana was investigating areas near the Reocin Mine attempting to develop additional reserves.

Industrial Minerals

Ammonia.—The major Spanish nitrogen producer, Fertilizantos Españoles S.A. (Fesa), completed the company's rationalization plan. The restructured company, named Fertiberia SL, consisted of seven of Fesa's operating units along with existing inventories. Fesa would remain as an operating company and retain all past liabilities. Freeport McMoRan Resources Partners Ltd., a 51% owned subsidiary of Freeport McMoRan Inc. of the United States, was negotiating the acquisition of a controlling equity interest in Fertiberia. Also, Freeport was negotiating with Morocco's Office Cherifienne des Phosphates regarding the possibility of a partnership in Fertiberia.

Ammonia capacity in Spain would be about 700,000 mt/a, well below the high of 900,000 mt/a produced during the 1980's.

Cement.—It was reported that a large number of civil construction projects were awaiting tenders, which would indicate a positive area for growth. Cementos Mexicanos S.A. purchased Valenciana de Cementos S.A., one of the country's largest producers, for an estimated $1.7 billion. This represented the largest and first really significant acquisition in Spain by a North American cement producer.

Kaolin.—Kaolin deposits occured in two different geological environments in Spain. One was a hydrothermal alteration of Pre-Hercynian granites in the northwestern part of Spain. The other source in eastern Spain was derived from the weathering of crystalline rocks of the Lower Cretaceous age. These two areas in the country were estimated to have produced more than 400,000 mt/a of kaolin and have resulted in Spain becoming one of the more important kaolin producers in Europe.

Explotaciones Ceramicas Españolas S.A. (ECESA) and Caolines de Vimianzo S.A. (CAVASA) was two of the largest kaolin producers in Spain. ECESA produced about 90,000 mt/a from its operations at Burela de Cabo, Lugo Province, and CAVASA produced about 100,000 mt/a from its operations at Vimianzo, Cap Finisterre, Galicia Province. Both companies produced ceramic, fiberglass, and paper-grade kaolin. ECESA also produced a range of kaolins for porcelain and earthenware.

Other Industrial Minerals.—Spain was the world's largest producer of slate, and, along with Greece, Italy, and Portugal, provided a significant volume of the world's supply of granite and marble. Increased infrastructure construction led to a growing importance of aggregates, and the ornamental rock sector continued to enjoy a steady demand despite the economic situation.

The dominant lime producer was Calcinor S.A. and its numerous associates. Together, these producers have a

capacity approaching 600,000 mt/a of burnt lime. Other producers included Tuledas Asturias S.A., which produced about 1,000 metric tons per day exclusively for the steel industry, and Calcopu S.A., which produced lime used in the mining and production of copper, iron, steel, and building materials.

RTM concluded exploration of a rare-earths deposit in Galicia. The Monte Galineiro deposit reportedly contained neodymium and yttrium used for superconducting materials. The deposit also was reported to contain cesium, niobium, thorium, and zirconium. At yearend, no decision was forthcoming on future development.

Minera San Albin S.A. (SMSA) was conducting exploration drilling on the Alto Eugenia Hill wollastonite deposit in Colmenar Viejo. SMSA estimated that 3.5 Mmt of calcite-garnet-wollastonite ore had been delineated, with an estimated wollastonite content of 900,000 mt.

Plans to develop the project reportedly ran into difficulty with the local community. The people of Colmenar Viejo were against the project owing to its being perceived as a potential hazard to local water supplies and its close proximity to the Virgen de los Remedios hermitage, which was attracting tourists.

Desarrollo de Recursos Geologicos (DRG) carried out an exploration program on its Illustacion wollastonite project near the Spain-Portugal border. The company reported that it had defined a deposit greater than 20 Mmt in size with an average grade of 35% wollastonite. DRG was looking for a joint-venture partner to participate in the project. Other than in Finland, little or no natural wollastonite was produced in Europe.

Mineral Fuels

Coal.—Spain was endowed with reserves of anthracite and bituminous coal and lignite, and was the third largest anthracite-bituminous coal producer in the EU. In the past, domestic production had provided the coal requirements of the power generation industries. About 97% of the coal produced was consumed domestically in thermoelectric plants. About one-third of Spain's coal needs was imported, and future plans called for increased coal usage in the electric generating industry. More coal was expected to be imported because Spanish coal, particularly lignite, has a high sulfur content. Imported coal, mainly from South Africa, was about 15% of consumption and was expected to reach 30% by the end of this century. Compliance with environmental legislation would require significant investments by most companies to utilize domestic lignite in operations.

The number one coal producer was the Government-owned company Hulleras del Norte S.A.(Hunosa), and the number one lignite producer was the 65% Government-owned company Empressa Nacional de Electricidad S.A.(Endesa). The Government-owned company Empresa Nacional Carbonifera del Sur S.A. (Encasur), also produced coal. The largest private sector coal producer was Sociedad Hullera Vasco Leonesa.

Under its Future Plan, Hunosa was reducing output, closing less profitable mines and concentrating on the most profitable deposits, and reducing its payroll in an attempt to lower its production costs. Endesa started up its new Corta Gargello open pit mine in Andorra. Encasur's two new open pit mines, Espiel and Cabeza de Vaca, went on-stream in 1994.

The EU and the Government were negotiating the future of the coal industry of Spain. The EU maintained that Spain should close at least one-half of its mines because the cost of national coal was often as much as six times the price of imported coal. Coal production in Spain was considered by the EU to be inefficient because the cost of coal at yearend was $253 per mt as compared with the average price of EU coal of about $77 per mt.

The Government maintained that, while coal reserves are abundant, they are difficult to mine because of narrow seams with many faults or a high ash content. Therefore, coal was more expensive than that imported from Poland or South Africa. This issue was not expected to be resolved quickly.

Natural Gas.—The energy contribution of domestic natural gas historically had been small, contributing only 3% of the country's energy requirements. The Spanish Government's National Energy Plan (PEN) has indicated that natural gas was expected to furnish 5% of Spain's energy requirements in the early 1990's. There have been significant gas discoveries, and the country has embarked on a drilling program to bring these resources to market. The Gaviota Field in the Cantabrian Sea and the Marisma onshore field provided most of Spain's natural gas. It was estimated these resources could provide about 2 billion cubic meters (m^3) per year.

A new pipeline would initially deliver 1.3 billion m^3 of natural gas from the Algerian gas fields via Morocco. This volume would reportedly increase to 2.8 billion m^3 by the late 1990's. The 2,000-km-long by 1.2-meter (m)-diameter pipeline, expected to be operational in late 1996, would cross the Strait of Gibraltar and enter Spain at a point still to be determined.

Petroleum.—Spain had very little domestic crude production, which accounted for a small percentage of the country's requirements. Casablanca, an offshore oilfield, and Ayoluengo, an onshore field, were the only two producing fields. There has been little effort to discover new reserves since two U.S. companies, Amoco Inc. and Chevron Inc., withdrew from Spanish exploration in 1989.

Uranium.—Empressa Nacional del Uranio (Enusa) was proceeding with the construction of a uranium concentrate plant to increase capacity at Saelices el Chico in the Province of Salamanca. The capacity of the plant would be increased from the 254 mt/a of U_3O_8 existing at yearend 1990 to 950 mt/a and was expected to be in operation by late 1995. The

project, estimated to cost $40 million, was being subsidized by the EU through the Salamanca Regional Development Organization.

The Spanish Government continued with the moratorium on construction of nuclear powerplants and finally wrote off the $5.3 billion cost of five partly built nuclear powerplants since construction was frozen 10 years ago. Reportedly, the reasons for extending the moratorium were cost, diversification of energy supply, and environmental protection. Also, one aspect of the new law reorganizing the electricity sector was the phasing-out of the nuclear power sector, which represents 35% of domestically produced energy.

Infrastructure

The Spanish National Railways (RNFE) operated on 13,500 km of 1.668-m-gauge track and 1,820 of 1-m-gauge track. This was different from the 1.435-m-gauge track used throughout most of Europe. Most of the 150,000 km of highways were paved. However, only a small portion were limited-access divided highways. Infrastructure improvements were one of the Government's priorities. The main ports are Barcelona, Bilboa, Cadiz, Cartagena, Gijon, Huelva, and Tarragona.

Outlook

The mineral resource base in Spain has not been fully exploited, and this mineral resource-rich country was expected to continue to contribute these resources for the continued development of Spain and the EU. An appreciable amount of exploration work was being carried out in various areas. This was expected to continue.

Lower labor costs in Spain and the abundant natural resources have fueled growth above the EU average growth rate. This is expected to continue although fears of an overheated economy have resulted in the tightening of the country's fiscal policy by the Government. By joining the EU, Spain gained virtually unrestricted access to a market that was 15 times larger in terms of purchasing power than its own.

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[1]Text prepared July 1995.

[2]Where necessary, values have been converted from Spanish pesetas (Ptas) to U.S. dollars at the rate of Ptas 130.2=US$1.00, the average exchange rate in 1994.

Major Sources of Information

Instituto Geological y Minero
Rios Rosas 23
28003 Madrid, Spain
Ministerio de Industria y Energia
Doctor Fleming, 7
28036 Madrid, Spain
Direccion General de Minas y Industrias de la Construccion
Ministerio de Industria y Energia
Serrano 37
28010 Madrid, Spain

Major Publications

Ministerio de Industria y Energia, Madrid:
Estadistica Minera de Espana, annual.
Industria Minera, monthly.
La Industria Siderurgica Espanola, annual.
Panorama Minero, annual
Annual reports from various mineral resource companies: Altos Hornos de Vizcaya; Asturiana de Zinc; Ensidesa Group; Grupo Instituto Nacional de Industria (INI); Inespal Group; Rio Tinto Minero; Repsol Petroleos; et al.

TABLE 1
SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity		1990	1991	1992	1993	1994 e/
METALS						
Aluminum:						
Bauxite		864 r/	600 r/ e/	-- r/	--	--
Alumina 3/		1,000,000	1,000,000 e/	959,000 r/	1,060,000 r/	1,000,000
Metal:						
Primary		353,000	355,000	359,000	356,000	340,000
Secondary		63,300	72,000 e/	96,500 r/	99,700 r/	98,000
Cadmium metal		355 r/ e/	344 r/	329 r/	340	350
Copper:						
Mine output, Cu content		10,900	8,320 r/	9,430 r/	3,520 r/	4,900
Metal:						
Blister: e/						
Primary		110,000	111,000	100,000 r/	125,000	125,000
Secondary		40,300	38,000	37,000 r/	48,000 r/	50,000
Total		150,000	149,000	137,000 r/	173,000 r/	175,000
Refined:						
Primary		116,000 e/	111,000 r/	134,000 r/	137,000 r/	142,000
Secondary		50,000 e/	38,000 r/	44,800 r/	42,000	46,800
Total		166,000	149,000 r/	179,000 r/	179,000 r/	188,000
Gold, mine output, Au content	kilograms	6,810	7,400	6,580	6,080 r/	6,000
Iron and steel:						
Iron ore and concentrates (including byproduct concentrate):						
Gross weight	thousand tons	3,030 e/	3,890 r/	2,970 r/	2,480 r/	2,500
Fe content	do.	1,440	1,760 r/	1,330 r/	1,110 r/	1,100
Metal:						
Pig iron	do.	5,540	5,400	5,080	5,450 r/	5,450
Ferroalloys, electric furnace	do.	157	150 e/	145 e/	117 r/	102
Steel:						
Crude	do.	12,700	12,900	12,300	12,600	13,500
Castings and forgings	do.	169	170 e/	160 e/	165	175
Total		12,900	13,100 e/	12,500 e/	12,800	13,700
Semimanufactures	do.	11,300	11,100	10,800	10,000	11,000
Lead:						
Mine output, Pb content		58,500	45,000 e/	30,000	25,300 r/	23,800
Metal: e/						
Primary		60,000	110,000 r/	62,000 r/	62,400	70,400
Secondary		50,000	59,000 r/	58,000 r/	56,000	62,000
Mercury:						
Mine output, Hg content	kilograms	--	--	--	--	
Metal	do.	962,000	52,000 r/ e/	36,000 r/ e/	64,300 r/	50,000
Silver, mine output, Ag content	do.	500,000 e/	182,000 r/ e/	191,000 r/ e/	159,000 r/	160,000
Tantalum minerals (tin byproduct): e/						
Gross weight	do.	10,000	8,000	8,000	6,000	5,000
Ta content	do.	2,600	2,000	2,000	1,500	1,200
Tin:						
Mine output, Sn content		27	12	7 r/	2 r/	2
Metal, primary e/		1,880 r/	1,670 r/	2,230 r/	2,000	2,000
Titanium dioxide e/		30,000	30,000	30,000	25,000	20,000
Tungsten, mine output, W content		10	--	--	--	
Uranium, mine output, U3O8 content		228	223 r/	187 r/	183 r/	200
Zinc:						
Mine output, Zn content		258,000	261,000 r/ e/	205,000 r/	170,000 r/	150,000
Metal, primary and secondary		253,000	262,000 r/ e/	352,000 r/	328,000 r/	301,000
INDUSTRIAL MINERALS						
Barite		11,300	5,200 r/ e/	6,190 r/	6,000 r/ e/	6,000
Bromine e/		300	300	250	200	200
Cement, hydraulic, other than natural	thousand tons	28,100	25,100 r/	25,100 r/	26,000	26,500
Clays:						
Attapulgite e/		53,900 r/	72,900 r/	87,300 r/	85,000 r/.	85,000

See footnotes at end of table.

TABLE 1--Continued
SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity		1990	1991	1992	1993	1994 e/
INDUSTRIAL MINERALS--Continued						
Clays - Continued:						
Bentonite		151,000	150,000 e/	150,000 e/	150,000	150,000
Kaolin, marketable:						
Crude e/		125,000	125,000	74,500 r/	125,000	75,000
Washed		423,000	413,000 e/	305,000 r	300,000	148,000
Other e/	thousand tons	10,000	10,000	10,000	13,000	10,000
Diatomite and tripoli		108,000	60,000 e/	36,000	38,000	40,000
Feldspar		214,000	214,000 r/	247,000 r/	239,000 r/	225,000
Fluorspar:						
Gross weight:						
Acid-grade		144,000	114,000	94,000 r/	82,000 r/	90,000
Fluorspar:						
Metallurgical-grade		9,680	6,000 e/	2,960 e/	5,000	5,000
Total		154,000	120,000 e/	97,000 e/	87,000	95,000
CaF2 content:						
Acid-grade		144,000	150,000 e/	100,000 e/	100,000	100,000
Metallurgical-grade		7,390	7,000 e/	5,000 e/	5,000	5,000
Total		151,000	157,000 e/	105,000 e/	105,000	105,000
Gypsum and anhydrite, crude	thousand tons	7,670	7,210	6,760 r/	7,250 r/	7,500
Kyanite, andalusite, related materials e/		3,600	3,600	3,600	3,000	3,500
Lime, hydrated and quicklime e/	thousand tons	1,200	1,200	1,200	1,200	1,000
Magnesite:						
Calcined		159,000	136,000 e/	133,000 r/	131,000 r/	135,000
Crude		444,000	445,000 e/	400,000 e/	400,000	400,000
Mica		913	300 e/	250 e/	250	
Nitrogen: N content of ammonia	thousand tons	466	557	479	354 r/	360
Pigments, mineral: e/						
Other		8,990 3/	8,600	7,910 r/	8,000	8,000
Red iron oxide		20,000	20,000	18,000	16,000	16,000
Potash, K2O equivalent		686,000 r/	585,000 r/	594,000 r/	661,000 r/	684,000
Pumice e/		900,000	800,000	800,000	700,000	700,000
Pyrite, including cuprous, gross weight	thousand tons	1,640	1,360	862	722 r/	746
Salt:						
Rock, including byproduct from						
potash works	do.	3,380	3,170 e/	2,710 e/	2,510	2,500
Marine and other	do.	858	900 e/	965 r/	900	850
Sand and gravel: Silica sand e/ 4/	do.	2,200	2,200	2,180 r/	2,200	2,000
Sepiolite		515,000	392,000 e/	400,000 e/	400,000	375,000
Sodium compounds, n.e.s.:						
Soda ash, manufactured	thousand tons	527	500 e/	500 e/	500	
Sulfate:						
Natural:						
Glauberite, Na2SO4 content		476,000	450,000 e/	482,000 r/	260,000 e/	350,000
Thenardite, Na2SO4 content		241,000	250,000 e/	189,000 r/	158,000 e/	250,000
Manufactured e/		150,000	150,000	150,000	150,000	150,000
Stone: e/						
Calcareous:						
Chalk	thousand tons	400	400	659 r/	500 e/	400
Dolomite	do.	4,000	4,000	4,376	4,500	4,400
Limestone	do.	115,000	115,000	175,000	160,000	150,000
Marble	do.	2,345 3/	2,210 3/	1,990 3/	2,127	2,000
Marl	do.	6,000	5,000	3,955 r/	4,000	4,000
Basalt	do.	2,500	2,500	3,000 r/	4,480 r/	4,500
Granite	do.	1,183 3/	1,150 3/	980 3/	1,170 r/	1,200
Ophite	do.	2,000	2,000	1,746 r/	2,500	3,000
Phonolite	do.	750	750	700	500	500
Porphyry	do.	700	700	958 r/	500	500
Quartz	do.	900	900	991 r/	1,600	1,500
Quartzite	do.	700	700	1,332 r/	1,000	1,000
Sandstone	do.	1,800	1,800	1,700	1,600	1,500
Serpentine	do.	400	400	811 r/	400	400
Other	do.	28,000	30,000	30,000	30,000	30,000
Strontium minerals: e/						
Gross weight		80,352	75,000	65,000	50,000	50,000
Sr2O4 content		32,140	29,000	26,000	20,000	20,000

See footnotes at end of table.

TABLE 1--Continued
SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity		1990	1991	1992	1993	1994 e/
INDUSTRIAL MINERALS--Continued						
Sulfur:						
S content of pyrites	thousands tons	748	599	406 r/	327	350
Byproduct: e/						
Of metallurgy	do.	248	252	258	250	250
Of petroleum	do.	149	105	90	100	100
Of coal (lignite) gasification	do.	2	2	2	2	2
Total e/	do.	1,147	958	756	679	702
Talc and steatite e/		70,000	70,000	70,000	65,000	65,000
MINERAL FUELS AND RELATED MATERIALS						
Coal (marketable):						
Anthracite	thousand tons	5,797	5,639	6,177 r/	6,054 r/	6,000
Bituminous	do.	13,760 r/	15,523 r/	12,374 r/	13,347 r/	12,000
Lignite	do.	16,373	19,636 r/	18,689 r/	17,460 r/	16,000
Total	do.	35,930	40,798	37,240	36,861	34,000
Coke, metallurgical e/	do.	3,163	3,144	2,939	3,000	3,000
Gas, natural (marketed)	million cubic meters	1,553	1,288	1,216	1,220	1,200
Peat e/		77,000	75,000	70,000	70,000	65,000
Petroleum:						
Crude	thousand 42-gallon barrels	7,593	7,615	7,818	7,800	7,800
Refinery products:						
Liquefied petroleum gas	do.	20,056	20,000 e/	21,541 r/	18,630 r/	19,848
Naphtha	do.	15,062	15,000 e/	22,040 r/	19,618 r/	19,006
Gasoline, motor	do.	80,376	80,000 e/	84,499 r/	79,296 r/	84,388
Jet fuel e/	do.	30,000	30,000	25,899 r/	24,536 r/	29,192
Kerosene e/	do.	29,000	29,000	26,404 r/	25,133 r/	29,249
Distillate fuel oil	do.	109,408	110,000 e/	122,128 r/	113,680 r/	121,695
Residual fuel oil	do.	92,907	92,000 e/	121,188 r/	97,865 r/	94,912
Other	do.	30,128	30,000 e/	30,000 e/	30,000	30,000
Refinery fuel and losses e/	do.	12,000	12,000	12,000	12,000	12,000
Total e/	do.	418,937	418,000	465,699	420,758	440,290

e/ Estimated. r/ Revised.
1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
2/ Table includes data available through Mar. 1994.
3/ Reflects aluminum hydrate.
4/ Includes sand obtained as a byproduct of feldspar and kaolin production.

TABLE 2

SPAIN: 1993 BALANCE OF PAYMENTS, SELECTED MINERAL COMMODITIES 1/ 2/

(Thousand dollars)

Mineral commodity	Exports to EU	Imports from EU	Net gain or (loss)	Exports to the world	Imports from the world	Net gain or (loss)
Crude industrial minerals:						
Feldspar	$1,680	$2,760	($1,070)	$1,790	$7,780	($5,990)
Magnesite	24	303	(279)	106	488	(382)
Slate	503	23	480	550	95	455
Other	192,000	140,000	52,300	269,000	337,000	(67,800)
Total	194,000	143,000	51,400	271,000	345,000	(73,800)
Metalliferous ores:						
Copper	29	35,900	(35,800)	5,880	233,000	(227,000)
Lead	1,780	30	1,750	3,010	30	2,980
Tin	--	5,910	(5,910)	--	8,010	(8,010)
Zinc	7,280	3,770	3,500	20,400	80,900	(60,500)
Other (including waste and scrap)	126,000	581,000	(455,000)	182,000	1,070,000	(887,000)
Total	136,000	627,000	(491,000)	211,000	1,390,000	(1,180,000)
Nonmetallic mineral manufactures	298,000	132,000	167,000	577,000	240,000	338,000
Metals:						
Iron and steel	1,510,000	1,640,000	(127,000)	3,030,000	1,990,000	1,040,000
Mercury	192	383	(191)	4,270	390	3,880
Other nonferrous metals	894,000	791,000	104,000	1,210,000	1,120,000	98,100
Total	2,400,000	2,430,000	(23,000)	4,240,000	3,100,000	1,140,000
Mineral fuels	836,000	938,000	(102,000)	1,960,000	9,360,000	(7,400,000)

1/ Data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Table prepared by Harold Willis, Section of International Data.

TABLE 3
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY OF 1994

(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.	Alumina plant at San Ciprián, Lugo	1,000
Aluminum		Aluminìo Español S.A.	Electrolytic plant at San Ciprián, Lugo	180
Do.		Industria Española del Aluminio, S.A.	Electrolytic plant at Avilés	100
Do.		do.	Electorlytic plant at La Coruña	25
Do.		Aluminío de Galicia S.A.	Electorlytic plant at Sabiñánigo	78
Do.		do.	do.	14
Coal:				
Anthracite		Antracitas Gaiztarro S.A.	Mines at María and Paulìna	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 (Endesa)	As Pontes Mine, and Andorra Mine, La Coroña	15,000
Barite		Minas de Baritina S.A. (Kali-Chemie of Germany, 100%)	Mine and plant in Espiel area, Córdoba	50
Cement		Approximately 36 cement companies,	54 plants, including	44,000
		of which the largest is--	5 (Asland) plants, of which the largest ones	(6,000)
		Asland S.A.	are plants at Puerto de Sagunto, Valencia,	2,000
			and at Villaluenga de la Sagra, Toledo	2,000
Copper:				
Metal		Rio Tinto Minera S.A. (Freeport McMoRan Inc., 65%; Ercros Group, 35%)	Smelter at Huelva	85
Do.		do.	Electrolytic refinery at Huelva	105
Do.		Industrias Reunidas de Cobre	Smelter at Asua-Bilbao	30
Do.		Electrolìtico y Metales S.A.	Fire and electrolytic refinery at Asua-Bibao	36
Ore		Rio Tinto Minera S.A. (Freeport McMoRan Inc., 65%, Ercros Group, 35%)	Mines and plant at Arientero, near Santiago de Compostela, Galicia	12
Do.		do.	Corta Atalay opencast mine, Cerro Colorado opencast mine and plant, and Alfredo underground mine--all in Rio Tinto area	30
Fluorspar		Fluoruros S.A. (Bethelhem Steel Corp., 49%)	Plant at Caravìa, near Colunga	400 (ore)
Do.		do.	Opencast mmines at San Lino and Val Negro, and underground mine at Eduardo, near Caravìa--all in Asturias	350 (ore)
Do.		do.	Plant at Collada, Gijón Mines at Veneros Sur and Corona, Gijón	200 (ore)
Iron ore		Compañìa Andaluza de Minas S.A.(Mokta, 62%)	Mine at Alquife, Granada	4,000
Do.		Altos Hornos de Vizcaya S.A. (U.S. Steel, 25%)	Nine mines in Province of Vizcaya	4,000
Do.		Compañìa Minera Siderúgica de Ponferrada S.A.	Eight mines in Province of León	3,000
Do.		Minera del Andévalo S.A.	Opencast mine at Coba, Huelba	2,000
Lead:				
Metal		Sociedad Minera y Metalúrgica de Peñarroya de España,S.A. (Peñarroya, France, 98%)	Smelter at Cartagena, Murcia Refinery at Cartagena, Murcia	60 60
Do.		Compañia La Cruz, Minas y Fundaciones de Plomo S.A. de Plomo S.A.	Smeler at Lineares, Jaén Refinery at Lineares, Jaén	40 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 España S.A. (Peñarroya, France 90%)	Opencast mine at Montos de Los Azules, near Unión, Murcia	25
Do.		Andaluza de Piritas S.A. (APIRSA)	Opencast mine at Aznalcóllar, Sevilla	21
Do.		Exploración Minera International 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		Minas de Almadén y Arrayanes S.A., (Government 100%)	Mine and smelter at Almadén	70,000 flasks
Petroleum:				
Crude	barrels per day	Chevron S.A.	Oilfield at Casablanca	300
Refined	do.	Repsol Petróleo S.A.	Refineries at Escombreras	200,000
Do.	do.	do.	Puertollano	140,000
Do.	do.	do.	Tarragona	260,000
Do.	do.	Refineria de Petróleos del Norte S.A. (Petronor)	Refinery at Somorrostro	240,000
Do.	do.	Compañía Española de Petróleos S.A.	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		Potasas de Navarra S.A.	Mines and plant near Pamplona	300 (ore)
Do.		Minas de Potasas de Suria S.A.	Mines at Suria	1,000 (ore)
Do.		Uníon Explosivos Rio Tinto S.A.	Mines at Balsareny/Sallent and Cardona	2,000 (ore)

TABLE 3--Continued
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY OF 1994

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Pyrite		Compañia 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. Uníon Explosivos (Rio Tinto, 75%; Rio Tinto Zinc, 25%)	Mines and plant at Rio Tinto, near Seville	900
Sepiolite		Tolsa S.A.	Mine and plant at Vicalvaro, near Toledo	100
Do.		Silicatos-Anglo-Ingleses S.A.	Mine and plant at Villecas near Madrid	200
Steel		Empresa Siderúrgica S.A. (Ensidesa), (Government, 100%)	Plants at Avilés, Veriña, and Mieres in Oviedo, and Moreda, Gijón	6,000
Do.		Altos Hornos de Viscaya S.A. (U.S. Steel, 20%)	Ironworks and steelworks at Sestao, Bilbao	1,500
Uranium	metric tons	Empresa Nacional del Uranio (Enusa), (Goverment,100%)	Mines and plant near Ciudad Real	500 (U_3O_8)
Zinc:				
Metal		Real Cía. Asturiana de Minas S.A.	Electrolytic zinc plant at San Juan de Nueva	200
Ore		do.	Reocin mines and plants near Torrelavega, Santander	500
Do.		Andaluza de Piritas S.A. (APIRSA)	Open pit mine at Aznalcóllar Sevilla	3,500 (ore)
Do.		Exploración Minera International España S.A. (EXMINESA)	Underground mine at Rubiales, Lugo	500 (ore)
Do.		Sociedad Minera y Metalúrgica de Penarroya-Espana S.A.	Mines and plants at Montos de los Azules y Sierra de Lujar, San Agustin	220 (ore)