

THE MINERAL INDUSTRY OF

ITALY

By Harold R. Newman

Italy was a significant processor of imported raw materials, as well as a significant consumer and exporter of mineral and metal semimanufactured and finished products. It was the world's largest producer of pumice and related materials, producing almost one-half of the world's output, as well as the world's largest feldspar producer, producing about one-fourth of the world's output. The country was the world's 8th and 10th largest producer of crude steel and cement, respectively. Italy was also an important producer of dimension stone and marble.

Italy's gross domestic product, adjusted for inflation, grew at a rate of 1.5% in 1998, as the Italian Government continued to exercise budget austerity and to reduce its role in the economy through privatization of its assets. Italy had the world's sixth largest economy in 1998 (U.S. Department of State, 1998, Country report on economic policy and trade practices—Italy, accessed January 13, 2000, at URL http://www.state.gov/www/issues/ec...rade_reports/europe98/italy98.html).

Growth in Italy's mining and extractive industries was marginal in 1998. Among the metallic ores, lead was mined, although production was minimal and decreasing. Most of the output comes from the Silius Mine in Sardinia. The small output of zinc ore came from the safety and environmental recovery work in the remaining sites in the Iglesias area of Sardinia.

Industrial mineral production remained the most important sector with overall output remaining about the same as that of 1997. Domestic production of natural gas decreased, and production of petroleum increased. (See table 1.)

Private and public companies owned facilities for the mining and processing of minerals and mineral products. Some enterprises were under state control for economic reasons and to maintain employment. However, the Government was proceeding with privatization efforts. The decision by the Government to divest its state company holdings in aluminum and a number of other industry sectors resulted in ongoing negotiations with Glencore AG of Switzerland and Comalco Ltd. of Australia to acquire the Government's 52.1% interest (held by the State company Alumix S.p.A.) in the Eurallumina S.p.A.'s refinery. Alumina was produced only by Eurallumina at Portoscuso, Sardinia. (See table 2.) Almost all alumina was produced from imported bauxite, most of which was obtained from Australia and Guinea (Metal Bulletin, 1998b).

As another part of the Government's privatization efforts, the Aluminum Company of America (Alcoa) acquired the principal operating assets of the only primary aluminum producer in Italy. The primary aluminum assets, now operated by Alcoa Italia S.p.A., included two smelters with a combined capacity of 180,000 metric tons per year (t/yr) at Porto Vesme and Fusina (Aluminum Company of America, 1998).

Other assets acquired in the transaction were a rolling mill with a capacity of 140,000 t/yr at Fusina; four aluminum

extrusion plants with a combined capacity of 70,000 t/yr at Bolzano, Fossanova, Feltre, and Iglesias; and a network of six metal distribution centers in Italy, three administrative centers, and sales offices in France, Germany, Spain, and the United Kingdom (Aluminum Company of America, data, [untitled], accessed February 4, 1998, at URL <http://www.shareholder.com/alcoa/news/>).

Details on output and/or capacity were not readily available on Italy's several secondary aluminum producers. However, all secondary aluminum ingot produced [more than 500,000 metric tons] was consumed by the automotive industry. This was about a 35% share of national aluminum consumption. Italy's secondary smelters imported about one-half of the aluminum scrap processed, which mostly came from France, Germany, and the United Kingdom (Newsalert, March 7, 1998, [untitled] accessed March 31, 1998, at URL <http://www.newsalert.com/fre/story?StoryId=Cnsb4ub8ZsJmXmdeYndy&Topic=Mining%2FMetals&Title=Headlines>).

Italy's refined copper production averaged about 89,000 t/yr between 1993 and 1997 and dropped significantly in 1998. Enirisorse S.p.A., the largest producer of refined copper in Italy, accounted for about one-half of Italy's copper output. There were no significant copper mines in Italy, and imports of ore were small. Imported scrap, ashes, slag, and other residues were the major sources of the copper produced in Italy.

Gold Mines of Sardinia Ltd. (GMS), a joint venture of Gold Mines of Sardinia (70%) and Progemisa S.p.A. (30%), completed construction of the main carbon-in-leach circuit and associated mill to recover gold and copper at its Furtei project, north of Cagliari. Furtei was the first gold mine of GMS and the first gold mine in Italy.

GMS reported that the latest drilling results from the Osilo project in northern Sardinia confirmed a major epithermal gold system. Of the 44 known veins, 4 were drilled, and all revealed excellent gold mineralization, which was 7.8 meters (m) long at 19.13 grams per ton (g/t) gold from the new Fieldies zone. Another intercept was 5 m long at 9.4 g/t gold (Mining Journal, 1998b).

Italy imported most of its supplies of lead and zinc concentrates. Within Italy, most lead and zinc concentrate production came from Enirisorse's mines in Sardinia. Enirisorse's lead and zinc smelters were also in Sardinia, and the electrolytic zinc plant was near Venice. The Porto Vesme smelter in Sardinia produced primary lead and zinc metal and cadmium, and the San Gavino complex, near Porto Vesme, produced refined lead and byproducts, such as bismuth, gold, and silver.

Enirisorse was negotiating the sale of its Porto Vesme lead/zinc smelter and its San Gavino lead/zinc smelter with Glencore. Glencore was selected after submitting the best offer

in a privatization tender. Porto Vesme and San Gavino were closed in mid-November so that refurbishment and environmental work could be carried out prior to transfer of ownership. Glencore confirmed that it had dropped its interest in the Crotona zinc smelter (Metal Bulletin, 1998a). Enirisor reported the Crotona smelter was operating at a reduced output level. The plant was running at a rate of 70,000 t/yr, as against a capacity of 100,000 t/yr. No further details were given (Mining Journal, 1998a).

Following the completion of a privatization program by the Government between 1992 and 1997, all the steel was produced by private companies. About 60% of the steel produced was by electric arc furnaces and 40% was by basic oxygen furnaces.

In the first half of 1998, crude steel output reached 13.9 million metric tons (Mt), 8.3% more than the 12.8 Mt produced in the same period in 1997. Apparent consumption in the first quarter of 1998 was as high as 8.9 Mt; on an annualized basis, this would equate to 32.5 Mt, up 11.6% from the 26.1 Mt recorded in 1997. This would be consistent with the 2.2% rise in the gross national product. This was considered to be optimistic by some observers in view of the fact the old car scrapping program finished in July 1998 (Metal Bulletin, 1998b).

The Riva Group suspended crude steel production at its Cornigliano works in Genoa. Production was cut in response to falling demand from Riva's rolling operations across Western Europe. Riva was considering various options for the permanent closure of the blast furnaces. There were no plans to close the rolling mills (Metal Bulletin, 1998).

Italy was the second largest cement producer of the European Union (EU), following Germany. Italcementi-Fabbriche Riunite Cemento S.p.A. was the largest of Italy's cement producers with 28 plants and more than 30% of the Italian market. (See table 2.) Italy was a net exporter of cement.

Most of Italy's bentonite ores were mined in Sardinia; processing plants were on the mainland. More than one-half of the country's bentonite production came from Industria Chimica Carlo Laviosa S.p.A. The company's main mining activity was in the Pedra de Fogu and the Puntenuova areas of Sardinia. Production from these areas fed the processing plants at Oristano, Sardinia, and Livorno, south of Pisa.

Montmorillonite clay (white bentonite) was quarried at S'Aliderru in northwestern Sardinia. Caffaro S.p.A., operating in Sardinia, was Italy's only producer of acid-activated montmorillonite. The clay was shipped to the company's plant at Porto Marghera near Venice. Several small bentonite producers operated on the mainland at Foggia, Puglia, and Pietracuta di S. Leo, Pesaro district.

Italy was the world's leading producer of feldspar and feldspathic minerals. These materials were important constituents of ceramic tile. Italy accounted for 30% of world tile output and more than 50% of the total tile produced in the EU. The more than 350 small companies producing tiles employed about 30,000 workers. Major sources for clay imports were, in declining order of importance, the United Kingdom, Germany, and the United States.

Italian marble occurs in many localities from the Alps to Sicily and was quarried at hundreds of operations. The most important geographic area for producing white marble is in the Apuan Alps in Tuscany, particularly near the town of Carrara.

The Lazio region of Lombardy, the Po Valley, Puglia, Sicily, and Venice are important colored-marble-producing areas. About one-half of production was in block form. About one-half of the total production was exported. Other major marble-producing areas include the Valle di Susa, near Turin in the northwestern Italian Alps; the valley of the Po River in Lombardy; the Verona-Vicenza area of Venice; and the vicinity of Benevento, northeast of Naples in southern Italy. Relative to consumption rates, resources were considered to be extensive.

Production of potash continued to remain suspended in 1998. The main reasons were the result of a severe drought that has restricted the availability of process water to the plants and the inability to remove waste material and mine water owing to environmental and ecological concerns. In Sicily, the underground mines that were previously operating at Pasquasia, Racalmuto, and Realmonte, remained on standby.

Italy was the world's leading producer of pumice and pozzolan. The Mediterranean Island of Lipari, 40 kilometers (km) off the northern coast of Sicily, was the center of the Italian pumice industry, where two companies, Pumex S.p.A. and Sta. Siciliana per l'Industria ed il Commercio della Pomice di Lipari S.p.A. (Italpomice S.p.A.), quarried pumice for world markets. Pumex, with about a 600,000-t/yr capacity, was Italy's largest pumice producer. The company quarried the Mount Pelato deposit on Lipari. Italpomice produced about 70,000 t/yr of pumice at Acqualcalda on Lipari (Industrial Minerals, 1998).

White talc was produced by Luzenac Val Chisone S.p.A., which operated an underground mine at Pinerolo near Turin. The white talc, mined from metamorphic rocks, has been of very high quality. Talco Sardegna S.p.A. operated an open pit mine at Orani. The Luzenac Group acquired a majority stake in Talco Sardegna, with the remaining share belonging to the Sardinian mining branch Salsarda (Industrial Minerals, 1998).

EU membership initiated important changes in Italy's energy sector, requiring privatization of dominant energy monopolies. Hence, the sector has been undergoing considerable restructuring in recent years. Ente Nazionale/Idrocarburi (ENI), the state-held oil and gas conglomerate, along with its main subsidiaries, Agip S.p.A. (hydrocarbons exploration and production) and Snam S.p.A. (gas supplies and distribution), and the state-owned electricity company, Ente Nazionale per l'Energia Elettrica (ENEL), had to be privatized. ENI and ENEL became joint-stock companies. The Government sold off shares of ENI between 1995 and 1998 and held 35% of the company in 1998. Privatization of ENEL stalled. According to EU directives, plans for privatization must proceed quickly in coming years (U.S. Energy Information Administration, September 1999, Country analysis briefs—Italy, accessed November 3, 1999, at URL <http://www.eia.doe.gov/emeu/cabs/italy.html>).

Italy was heavily dependent on imported coal. Most imports were, declining order of importance, from Russia, South Africa, the United States, and China. Lignite coal was produced by ENEL. Extraction problems and environmental reasons caused a further reduction in output from ENEL's Santa Barbara Mine in Tuscany, the only lignite mine in Italy.

Geothermal energy was produced in the Larderello, the Monte Amiata, and the Travale areas in Tuscany. Exploration on the use of various geologic techniques and research of exploitation

of geothermal energy by power stations have been actively pursued in these areas.

More than 100 natural gas fields were in operation; 70% was located offshore. About 35% of Italy's natural gas demand was met from domestic production. Algeria supplied more than 25% of Italy's natural gas needs through a 1,070-km-long natural gas pipeline from Algeria to Mazzara del Vallo in Sicily. Russia and other countries of the former Soviet Union supplied about 25% of the country's natural gas through a pipeline across Austria and the Czech Republic.

Despite increasing domestic production of crude oil, Italy was almost totally dependent on imported crude oil for its needs. Some 75 Mt of crude oil was imported. The major sources were, in declining order of importance, Libya, Iran, and Saudi Arabia.

The Government was hoping this situation would change with the discovery of the Agri oilfield in the Val d'Agri area of southern Italy by Agip S.p.A. in September 1997. The Agri field was believed to be the largest in the European continent with estimated reserves of 622 million barrels. So far, four producing wells have been developed and were flowing 8,000 barrels per day (bbl/d). Agip was planning to invest about \$1.4 billion in developing the area (Alexander's Gas and Oil Connections, October 27, 1998, Agip finds very large oilfield in South Italy, accessed March 3, 1999, at URL <http://www.gasandoil.com/goc/discover/dix74414.htm>).

An agreement reached in June 1998 between ENI and the Basilicata regional authority made way for the Val d'Agri oilfields to be developed to produce more than 100,000 bbl/d, doubling Italy's present oil output (Petroleum Economist, 1998).

Public and private spending on environmental controls is expected to grow, particularly in the areas of water treatment, transportation equipment and services, disposal of urban and industrial waste, remediation of soil contamination, and control of emissions.

Mining of metallic ores is expected to remain at its reduced level because of ore depletion and eventually cease altogether. The metals-processing industry, based primarily on imported stocks, is expected to continue to play an important role in Italy's economy. Italy is expected to remain a large producer of

crude steel and a significant producer of secondary aluminum in the EU.

The industrial minerals quarrying industry and preparation plants are expected to remain significant, especially in the production of barite, cement, clays, fluorspar, marble, and talc. Italy is expected to continue to be the world's leading producer of feldspar, feldspathic minerals, and pumice. The ceramics sector is expected to be important, particularly regarding exports.

Domestic outputs of natural gas, crude petroleum, and petroleum refinery products are expected to grow, although Italy will continue to depend on imported coal, gas, and petroleum for most of its needs.

References Cited

- Aluminum Company of America, 1998, Form 10-K—996: Securities and Exchange Commission, 31 p.
- Industrial Minerals, 1998, Italy's minerals poised for ceramic markets: *Industrial Minerals*, no. 374, November, p. 21.
- Metal Bulletin, 1998a, Porto Vesme sale proceeds after refurbishment is completed: *Metal Bulletin*, no. 8331, November 30, p. 5.
- 1998b, Recent and forthcoming privatization of West European non-ferrous metals producers: *Metal Bulletin*, no. 8273, April 30, p. 10.
- Mining Journal, 1998a, Crotona zinc plant output reduced: *Mining Journal* [London], v. 331, no. 8507, November 20, p. 407.
- 1998b, Sardinian gold excitement: *Mining Journal* [London], v. 332, no. 8517, February 5, p. 76.
- Petroleum Economist, 1998, Apennine oil development moves ahead: *Petroleum Economist*, v. 65, no. 7, July, p. 35.

Major Sources of Information

- Associazione Mineraria Italiana
Via delle Madonne, 20
00197 Rome, Italy
- Ministero dell'Industria del Commercio e dell'Artigianato
Direzione Generale delle Miniere
Via Molise, 2
00184 Rome, Italy

TABLE 1
ITALY: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1994	1995	1996	1997	1998 e/
METALS					
Aluminum:					
Bauxite, gross weight	23,400	11,200	--	--	--
Alumina, calcined basis	556,928	560,100 r/	575,800 r/	597,000 r/ e/	590,000
Metal:					
Primary	175,631	197,750	184,377	187,719	186,953 2/
Secondary	375,500	412,300	376,600	442,900	502,600 2/
Antimony, oxides, gross weight 3/	900	757	800	800	700
Bismuth metal	5	5 e/	5	5 e/	5
Cadmium metal, smelter	475	308	296	287	328 2/
Copper, metal, refined, all kinds e/	84,000	98,000	85,800	85,700 r/	29,100 2/
Gold, Au content kilograms	--	--	--	--	1,200 2/
Iron and steel, metal:					
Pig iron thousand tons	11,157	11,684	10,427	11,348	10,704 2/
Ferroalloys:					
Electric furnace:					
Ferrosilicon	22,650	51,017	29,915	11,295	11,487 2/
Ferromanganese	16,000	20,216	25,143	16,000	16,000
Ferrosilicon	--	--	11,741	12,000	12,000
Silicomanganese	50,000 e/	103,961	100,353	100,000	100,000
Silicon metal	--	15,006	14,240	15,000	15,000
Other e/	10,000	10,000	10,000	10,000	10,000
Total e/	98,650 r/	200,200	191,392	164,295 r/	164,487
Steel, crude thousand tons	26,114	27,766	23,922	25,537	25,826 2/
Semimanufactures do.	22,775	22,000 e/	23,048	23,146	22,648 2/
Lead:					
Mine output, Pb content	13,902	15,142	14,070	11,792	6,800
Metal, refined:					
Primary	91,700 e/	84,900 e/	65,900	65,700	57,400 2/
Secondary	114,200 e/	95,500 e/	143,900	145,900	141,900 2/
Total e/	205,900	180,400	209,800	211,600	199,300 2/
Manganese, mine output:					
Gross weight	8,200	6,548	5,829	6,523 r/	6,000
Mn content	1,868	1,625	1,450	1,590 r/	1,440
Silver, metal kilograms	12,080	13,900	9,100 e/	4,500 r/	2,500
Zinc:					
Mine output, Zn content	22,906	24,500 e/	11,055	8,470	2,459 2/
Metal, primary	255,900	259,600	269,000	268,300	231,600 2/
INDUSTRIAL MINERALS					
Barite	57,856	44,000	80,463	26,300	36,000
Bromine e/	300	300	300	300	300
Cement, hydraulic thousand tons	32,713	33,715	33,327	33,721	35,000
Clays, crude:					
Bentonite do.	386	591	475	513	592 2/
Refractory excluding kaolinitic earth do.	619	730 e/	784	750 e/	750
Fuller's earth do.	24	34	26	30 e/	30
Kaolin do.	74	88	126 r/	100 e/	100
Kaolinitic earth do.	7	10 e/	9	10 e/	10
Diatomite e/	25,000	25,000	25,000	25,000	25,000
Feldspar thousand tons	1,807	2,199	2,310	2,200 e/	2,748 2/
Fluorspar:					
Acid-grade	52,630	91,529	103,527	105,800	92,000
Metallurgical-grade	15,312	33,140	23,000	20,000	15,000
Total	67,942	124,669	126,527	125,800	107,000
Gypsum thousand tons	1,361	1,493 r/	1,275 r/	1,300 e/	1,300
Lime, hydrated, hydraulic and quicklime e/ do.	3,500	3,500	3,500	3,500	3,500
Nitrogen, N content of ammonia do.	504	487	397	445	409 2/
Perlite e/	65,000	60,000	60,000	60,000	60,000
Pigments, mineral, iron oxides, natural e/	600	600	500	500	500
Pumice and related materials: e/					
Pumice and pumiceous lapilli thousand tons	700	650	600	600	600
Pozzolan do.	4,500	4,000	4,000	4,000	4,000
Pyrite, all types, gross weight do.	258	--	--	--	--

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	1994	1995	1996	1997	1998 e/
INDUSTRIAL MINERALS--Continued					
Salt:					
Marine, crude e/ 4/	thousand tons	600	600	600	600
Rock and brine	do.	3,353	2,952	2,941	3,500 r/
Sand and gravel: e/					
Volcanic sand	do.	100	100	100	100
Silica sand	do.	2,700	3,000	2,950	3,000
Other sand and gravel		100,000	87,000	90,000	100,000
Sodium compounds: e/					
Soda ash	thousand tons	1,050	1,070	1,100	1,000
Sodium sulfate	do.	125	125	125	125
Stone: e/ 5/					
Calcareous:					
Alabaster	do.	25	25	25	25
Marble in blocks:					
White	do.	110	100	103	100
Colored	do.	3,000	3,000	3,000	3,000
Travertine	do.	1,000	2,000	2,610	2,500
Other:					
Granite	do.	1,000	1,000	67	100
Sandstone	do.	1,800	1,800	1,800	1,800
Slate	do.	120	120	107	100
Crushed and broken:					
Dolomite	do.	700	700	780 r/	760 r/
Limestone	do.	120,000	120,000	120,000	120,000
Marl for cement	do.	12,000	14,000	14,000	15,000
Serpentine	do.	1,500	1,400	1,662	1,500
Quartz and quartzite	do.	250	250	29	30
Sulfur, recovered as elemental and in compounds:					
S content of pyrite	do.	108	--	--	--
Byproduct, oil refining and other sources e/	do.	300	530 r/	551 r/	609 r/
Total e/	do.	408	530 r/	551 r/	609 r/
Talc and related materials		139,200	136,000	136,000 e/	142,000 e/
MINERAL FUELS AND RELATED MATERIALS					
Asphalt and bituminous rock, natural		36,000	31,620	29,646	30,000 e/
Coal:					
Lignite	thousand tons	517	352	223	203
Subbituminous, Sulcis coal		--	--	4,787	2,800
Coke, metallurgical	thousand tons	5,000 e/	5,000 e/	4,686	5,214
Gas, natural	million cubic meters	20,506	20,383	20,218	19,500 e/
Natural gas liquids e/	thousand 42-gallon barrels	400	400	400	400
Petroleum:					
Crude	do.	33,212	35,466	36,994	36,720 e/
Refinery products:					
Liquefied petroleum gas	do.	26,622	25,926	25,114	26,181 r/
Gasoline	do.	160,251	160,000 e/	160,000 e/	171,615
Naphtha e/	do.	30,000 r/	30,000 r/	30,000 r/	33,040 2/
Jet fuel e/	do.	23,007 2/	24,000	24,000	24,000
Kerosene e/	do.	34,929 2/	35,000	35,000	35,000
Distillate fuel oil e/	do.	220,000	220,000	220,000	256,833 2/
Residual fuel oil	do.	138,781	140,000 e/	140,000 e/	112,180
Other e/	do.	35,000	35,000	35,000	35,000
Refinery fuel and losses e/	do.	2,000 r/	2,000 r/	2,000 r/	1,800 r/
Total e/	do.	670,590 r/	671,926 r/	671,114 r/	695,649 r/

e/ Estimated. r/ Revised.

1/ Table includes data available through July 1999.

2/ Reported figure.

3/ Antimony content is 83% of gross weight.

4/ Does not include production from Sardinia and Sicily estimated to be 200,000 metric tons per year.

5/ Output of limestone and serpentine for dimension stone is included with "Stone: Crushed and broken." In addition to the commodities listed, a variety of other dimension stone was produced and previously listed, but available general information is inadequate for continued reliable estimation of output levels.

TABLE 2
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Eurallumina S.p.A. (Comalco Ltd., 56.2%, Glencore AG, 43.8%)	Plant at Porto Vesme, Sardinia	950
Aluminum	Alcoa Italia S.p.A. (Aluminium Company of America, 100%)	Smelters at Porto Vesme, Sardinia, and Fusina, near Venice	188
Asbestos	Amiantifera di Balangero S.p.A.	Mine at Balangero, near Turin	100
Barite	Bariosarda S.p.A. (Ente Mineraria Sarda)	Mines at Barega and Mont'Ega, Sardinia	100
Do.	Edem S.p.A. (Government)	Mines at Val di Castello, Lucca	20
Do.	Edemsarda S.p.A. (Soc. Imprese Industriali)	Mines at Su Benatzu, Sto Stefano, and Peppixeddu, Sardinia	20
Do.	Mineraria Baritina S.p.A.	Mines at Marigolek, Monte Elto, and Primaluna, near Milan	20
Bauxite	Sardabauxiti S.p.A. (Government)	Mine at Olmedo, Sardinia	350
Bentonite	Industria Chimica Carlo Laviosa S.p.A.	Mines and plant on Sardinia Island, and a plant near Pisa	250
Cement	52 companies, of which the largest are: Italcement Fabbriche Riunite Cemento S.p.A.	28 plants, of which the largest are: Calusco, Monselice, and Collefero	(15,000)
Do.	Unicem S.p.A.	12 plants, of which Guidonia, Lugagnano, Morano, Piacenza, S'Arcangelo di Romagna, and Settimello are the largest	(10,000)
Do.	Cementerie del Tirreno S.p.A (Cementir)	6 plants at Arquata Scivia, Livorno, Maddaloni, Napoli, Spoleto, and Taranto	(5,300)
Copper, refined	Enirisorse S.p.A. (Government)	Refineries at Porto Marghera, near Venice, and Pieve Vergonte	46
Do.	Europa Metalli - LMI S.p.A.	Refineries at Campo Tizzoro, Fornaci di Barga, and Villa Carcina	26
Do.	Chimet S.p.A.	Refinery at Arezzo	13
Feldspar	At least 5 companies, of which the largest are: Maffei S.p.A.	Surface mines at Pinzolo, Sondalo, and Campiglia Marittima; underground mine at Vipiteno	1,500 (200) (300)
Do.	Miniera di Fragne S.p.A.	Surface mine at Alagna Valsesia	(60)
Do.	Sabbie Silicee Fossanova S.P.A. (Sasifo)	Surface mine at Fossanova	(30)
Gold	Gold Mines of Sardinia Ltd. 70%, Government 30%	Furtei Mine near Cagliari, Sardinia	1,400 1/
Lead-zinc, ore	Enirisorse S.p.A. (Government)	Mines at Masua, Monteponi, and Sardinia	60
Lead, metal	do.	Refinery at San Gavino, Sardinia	80
		Kivcet smelter and Imperial smelter at Porto Vesme, Sardinia	114
Lignite	Ente Nazionale per l'Energia Elettrica (ENEL)	Surface mines at Pietrafitta and Santa Barbara	1,500
Magnesium, metal	Societa Italiana Magnesio S.p.A. (INDEL)	Plant at Bolzano	8
Marble	A number of companies, largest of which include: Mineraria Marittima Srl	Quarries in the Carrara and Massa areas	2,000 (500)
Do.	Industria dei Marmi Vicentini S.p.A.		(300)
Do.	Figaia S.p.A.		(100)
Petroleum, crude	Ente Nazionale Idrocarburi (ENI) Government	Oilfields: offshore Sicily, the Adriatic Sea, and onshore in the Po River Valley	90
Petroleum, refined	do.	About 30 refineries	2,000 2/
Potash ore	Industria Sali Otassici e Affini per Aziono S.p.A.	Underground mines at Corvillo, Pasquasia, Racalmuto, and San Cataldo, in Sicily	1,300
Do.	Sta Italiana Sali Alcalini S.p.A. - (Italkali)	Underground mines at Casteltermini and Pasquasia, Sicily	700
Pumice	Pumex S.p.A.	Quarries, Lipari Island, north of Sicily	600
Do.	Sta Siciliana per l'Industria ed il Commercio della Pomice d	do.	200
Pyrite	Nuova Solmine S.p.A.	Underground mines at Campiano and Niccioleta	900
Salt, rock	Sta Italiana Sali Alcalini S.p.A. (Italkali)	Underground mines at Petralia, Racalmuto, and Realmonte, Sicily	4,000
Do.	Solvay S.p.A.	Underground mines at Buriano, Ponteginori, and Querceto, Tuscany	2,000
Steel	Ilva Laminati Piani S.p.A. (Riva Group)	5 steel plants, the largest of which is Taranto (1,300)	4,000
Do.	Riva S.p.A.	About 5 plants	7,000
Do.	AFV Beltrame S.p.A.	Steel plant at Vicenza	700
Talc	Luzenac Val Chisone S.p.A.	Mines at Pinerolo, near Turin, and at Orani, Sardinia	120
Do.	Talco Sardegna S.p.A.	Mine at Orani, Sardinia	20
Zinc, metal	Enirisorse S.p.A. (Government)	Plants at Crotone and Porto Vesme, Sardinia, and Porto Maghera, near Venice	349

1/ Kilograms.

2/ Thousand 42-gallon barrels per day.