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The Mineral Industry of Portugal

By Lindsey Abdale

Portugal hosts metallic and nonmetallic mineral resources, such as copper, feldspar, kaolin, limestone, marble, silver, tin, and zinc. In 2016, Portugal was the sixth-ranked producer of lithium globally. One-half of the Iberian Pyrite Belt (IPB) is in Portuguese territory, where volcanogenic massive sulfide deposits, such as the Neves-Corvo deposit, have been exploited. The IPB is considered the primary source of base metals in the European Union (EU), and is under extensive exploration for various metallic minerals, such as copper, gold, and lead (table 1; Veiga, 2013; Jaskula, 2018).

Minerals in the National Economy

Portugal's real gross domestic product (GDP) increased by 1.4% in 2016, which was similar to the growth rate of 1.6% in 2015. The nominal GDP was $204.65 billion in 2016. The gross value added (GVA) for the manufacturing industry in 2016 was about $25.3 billion,[1] which was an increase of 2.4% compared with that of 2015. The GVA for the construction sector was about $7.4 billion, which was a decrease of about 1.1% compared with that of 2015. The industry, construction, energy, and water sectors in 2016 together represented 22.4% of the GVA and 24.5% of employment (Instituto Nacional de Estatistica, 2016; AICEP Portugal Global, 2017, p. 4; International Monetary Fund, 2017).

Portugal's exports of goods amounted to $55.65 billion in 2016, which was an increase of 0.9% from that of 2015. Imports of goods amounted to $67.57 billion in 2016, which was an increase of 1.2% from that of 2015. The leading export partners were, by value, Spain (which received 26.2% of Portugal's exports), France (12.6%), Germany (11.6%), and the United Kingdom (7.0%). Base metals made up 7.3% of total exports; petroleum products, 6.2%; and minerals and mineral products, 4.7%. The leading import partners were Spain (which supplied 32.8% of Portugal's imports, by value), Germany (13.5%), France (7.8%), and Italy (5.5%). Petroleum products made up 10.1% of total imports; base metals, 7.4%; and minerals and mineral products, 1.4% (AICEP Portugal Global, 2017, p. 6–8).

Production

In 2016, the production of most metallic minerals increased and the production of many industrial minerals decreased. The production of lithium (lepidolite, pegmatite, 1.5% Li) increased by 52.9% to 26,000 metric tons (t); feldspar, by 40.9% to 132,105 t; slate and tin (mine production, Sn content), by 28.6% each, to 9,000 t and 54 t, respectively; tungsten (mine production, concentrate, WO_3 content), by 17.3% to 556 t; and kaolin, by 10.3% to 278,000 t. The production of rock salt decreased by 80% to 6,000 t; gabbro, by 48.5% to 421,000 t; schist, by 26.2% to 141,000 t; hydraulic cement, by 25% to 4.2 million metric tons (Mt); and graywacke and gypsum, by 17.7% each to 14,000 t and 255,000 t, respectively.

Structure of the Mineral Industry

In Portugal, the companies that produced and processed mineral commodities were privately owned. The state had full ownership rights of all mineral resources, but quarries were privately owned. Table 2 is a list of major mineral industry facilities, their locations, and their production capacities (Vitor and others, 2012; Frias and Protasio, 2017).

Portugal's mineral industry was regulated by the Ministry of Economy and was under the direct supervision of the General Directorate of Energy and Geology. Mining activity—including prospecting, exploration, and exploitation of geologic resources—was governed by the Legal Framework for the Discovery and Use of the Geological Resources, which was enacted on June 22, 2015, and revoked the previous Decree-Law 90/90 of March 16, 1990. Petroleum and gas were excluded from the geological resources law and were regulated by other laws, such as Decree-Law 109/94 of April 1994 (Vitor and others, 2012; Frias and Protasio, 2017).

Commodity Review

Metals

Copper and Zinc.—In 2016, Portugal produced 74,435 t of mined copper (Cu content) and 70,000 t of mined zinc (Zn content). Lundin Mining Corp. of Canada, through its wholly-owned subsidiary Sociedade Mineira de Neves-Corvo S.A. (Somincor), operated the Neves-Corvo underground mine located in southern Portugal southeast of Lisbon in the western part of the IPB. The mining concession agreement between Somincor and the Government of Portugal covered an area of 28.9 square kilometers (km^2) and provided the rights to exploit the Neves-Corvo and Semblana areas for cobalt, copper, gold, lead, silver, tin, and zinc for a period of 50 years (from 1994 to 2044). As of June 2016, the total proven and probable reserves for the Neves-Corvo Mine were 28.6 Mt of copper ore grading 2.6% copper, 0.7% zinc, 0.2% lead, and 34 grams per metric ton (g/t) silver. The total proven and probable reserves of zinc ore were 34.1 Mt grading 7.5% zinc, 1.8% lead, 0.4% copper, and 66 g/t silver. In May 2015, Somincor was granted an exploration concession for a 141-km^2 area that surrounds the Neves-Corvo Mine for a period of 3 years. As of June 2016, the concession was under negotiation (Lundin Mining Corp., 2017, p. 6, 18).

Tungsten.—In January, 2016, Almonty Industries Inc. of Canada acquired a 100% ownership interest in Beralt Ventures Inc. from Sojitz Tungsten Resources, Inc. This acquisition granted Almonty ownership of the Panasqueira tungsten mine in Covilha, Castelo Branco. The mine was expected to produce

[1]Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average annual exchange rate of EUR0.90372=US$1.00 for 2016.

about 709 t of tungsten trioxide (WO_3) concentrate from October 2016 through September 2017. As of September 2016, the proven and probable reserves were 1.95 Mt of ore, which was a 17.5% increase from those of 2015. The reserves had an average grade of 0.2% WO_3 and their grade cutoff was 0.12% WO_3 (Almonty Industries, 2016; Wheeler, 2016, p. 15, 146).

In November 2016, BMR Group PLC entered into an option agreement with Mineralia-Minas, Geotecnia E Construcoes, LDA (Mineralia) in which, by investing about $110,650 before November 2017, the company would have the option to acquire an 80% interest in an exploration concession for tungsten and tin at the Ester property in northern Portugal. The Ester project covered an area of 327.7 km^2, was located approximately 70 kilometers north of the Panasqueira Mine, and included the Rio de Frades and the Regoufe tungsten mines (BMR Group PLC, 2016).

Industrial Minerals

Cement.—Cimentos de Portugal, SGPS, S.A. (Cimpor), which was owned by Grupo Camargo Correa, was the leading cement producer in Portugal and one of the 10 leading producers in the world. In 2016, the company's cement and clinker sales in Portugal and Cape Verde reached 3.19 Mt, out of a worldwide total of 24.3 Mt, which was a decrease of 30.6% from the 4.59 Mt reported in 2015. Total sales in Portugal and Cape Verde in 2016 were reported to be $288 million, out of a worldwide total of $2.27 billion, which was an 18.1% decrease from the $352 million reported in 2015 (Cembureau, 2017, p. 13; Cimentos de Portugal, SGPS, S.A., 2017, p. 24).

Lithium.—Portugal was the leading lithium producer in Europe and produced 26,000 t of lithium (lepidolite, pegmatite, 1.5% Li) in 2016. In June, Dakota Minerals Ltd. entered into an agreement with Lusorecursos LDA to acquire 100% rights to the company's Lusidakota lithium projects in northern Portugal. The Lusidakota tenement package consisted of eight exploration licenses (one granted and seven at the application stage). These lithium projects were located in districts of pegmatitic dike swarms in Serra de Arga, Barroso-Alvao, and Barca de Alva in northern Portugal. In 2016, Dakota Minerals commenced exploration in the Barroso-Alvao region, including conducting rock-chip sampling and shallow drilling (Dakota Minerals, 2016, p. 5).

Mineral Fuels and Other Sources of Energy

Petroleum.—In 2016, Petroleos de Portugal S.A. (Petrogal), which was a wholly owned subsidiary of Galp Energia, SGPS, SA, operated two crude petroleum refineries, the Sines and Matosinhos; these were the only crude petroleum refineries in Portugal. The two refineries had a total capacity of 330,000 barrels per day, or about 120 million barrels per year. In 2016, crude petroleum was imported mainly from countries of the former Soviet Union (40% of the total), West Africa (30%), and the Middle East (18%). In 2016, exports of refinery products totaled 42.6 million barrels, which was an increase of 3% from those of 2015. Diesel and fuel oil each accounted for 29% of total exports, and gasoline accounted for 28%. These were sent mostly to Morocco, Spain, and the United States. Gasoline exports to the United States accounted for about 20% of Galp's total exports in 2016 (Galp Energia, SGPS, S.A., 2017, p. 46, 47, 50).

Renewable Energy.—In 2016, wind power accounted for 10.4% of all electricity consumption by EU countries. Portugal added 268 megawatts (MW) of wind capacity in 2016, for a total of 5,316 MW of installed capacity at the end of the year. Portugal was ranked seventh among EU countries in the wind energy market relative to its electricity demand in 2016 (WindEurope, 2017, p. 8–9, 18).

Outlook

The Portuguese economy has experienced growth since 2012, and the country's real GDP is expected to continue to increase into 2018. Production of metal ores and concentrates is expected to remain steady. Continued investment in renewable energy sources will gradually decrease the country's dependence on imported energy in the long-term, but Portugal will remain dependent on imported crude petroleum and natural gas for the foreseeable future.

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TABLE 1
PORTUGAL: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise noted)

Commodity[2]		2012	2013	2014	2015	2016
METALS						
Copper, mine production, Cu content		74,043	77,236	75,433	83,081	74,453
Iron and steel, raw steel	thousand metric tons	1,960	2,050	2,070	2,030	2,010
Lead, refinery production, secondary[e]		5,000	4,000	5,000	5,000	5,000
Silver, mine production, Ag content	kilograms	27,244	37,025	39,350	37,677	35,211
Tin, mine production, Sn content		42	84	75	42	54
Tungsten, mine production, concentrate, WO_3 content		763	692	671	474	556
Zinc, mine production, Zn content	thousand metric tons	30	53	67	67 [r]	70
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand metric tons	6,000 [r]	6,200 [r]	5,400 [r]	5,600 [r]	4,200
Clay and shale, kaolin, washed and unwashed	do.	321	248	269	252 [r]	278
Feldspar, mine production		109,273	70,057	70,865	93,789	132,105
Gypsum, including anhydrite	thousand metric tons	322	299	329	310	255
Lithium, lepidolite, pegmatite, 1.5% Li	do.	21	20	17	17	26
Salt, rock	do.	520	473	70	30	6
Stone, sand, and gravel:						
Sand and gravel, construction, sand	do.	7,248	6,475 [r]	7,157	7,517 [r]	6,780 [3]
Silica, mine production:						
Quartz	do.	38	4	7	1	1
Quartzite	do.	42	30	30	27 [r]	25 [3]
Stone, crushed:						
Basalt	do.	325 *	243 *	266 *	264 *	256 [3]*
Dolomite	do.	--	--	--	--	54 *
Gabbro	do.	467	295	595	817 [r]	421
Granite	do.	19,099	13,630	12,739	13,535 [r]	13,000 [3]
Graywacke	do.	104	74	19	17	14
Limestone	do.	25,260	21,275	21,034	21,757 [r]	20,000 [3]
Marble	do.	292	418	363	199 [r]	200 [3]
Schist	do.	925	147	119	191 [r]	141
Slate	do.	13	13	19	7	9
Talc and related materials, talc	do.	15	11	15	11	12
MINERAL FUELS AND RELATED MATERIALS						
Petroleum, refinery production	thousand 42-gallon barrels	87,600	104,000	95,000	115,000 [e]	112,000 [e]

[e]Estimated. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through December 21, 2017. All data are reported unless otherwise noted.

[2]In addition to the commodities listed, ammonia, beryl concentrate, calcium carbonate, crushed granite, diatomite, hot-rolled steel, iron ore and concentrate, manganese, manufactured gas, metallurgical coke, pig iron, pyrite and pyrrhotite (including cuprous), refractory clay, secondary aluminum, sodium compounds, sulfur, syenite, and white arsenic may have been produced in Portugal, but available information was inadequate to make reliable estimates of output.

[3]Estimated by Portugal's statistics agency; rounded to three significant figures.

*Correction posted on January 23, 2020.

TABLE 2
PORTUGAL: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Calcium carbonate		Omya Mineral Portuguesa Lda. (Salmon & Cia Lda., 50%, and Omya AG, 50%)	Mine and plant at Fatima	100
Cement		Cimentos de Portugal, SGPS, S.A. (Cimpor) (Grupo Camargo Correa, 94.19%)	Plants (3) at Alhandra, Loule, and Souselas	9,100
Do.		Companhia Geral de Cal e Cimento, S.A. (Secil) [Sociedade de Investimento e Gestão, SGPS, S.A. (Semapa), 100%]	Plants at Setúbal, Leiria, and Alcobaça	4,000
Copper, concentrate		Sociedade Mineira de Neves-Corvo , S.A. (Somincor) (Lundin Mining Corp., 100%)	Neves-Corvo Mine near Castro Verde	300
Do.		do.	Lombador Mine near Castro Verde	20
Do.		Minas do Alentejo, S.A. (Almina)	Alentejo	NA
Diatomite		Sociedade Anglo-Portugesa de Diatomite Lda.	Mines at Obidos and Rolica	150
Kaolin		Saibrais Arelas e Caulinos S.A. (Denain Anzin Mineraux S.A.)	Mines at Casal dos Bracais and Mosteiros	175
Lithium minerals, pegmatite		Pegmatítica-Sociedade Mineira de Pegmatites Lda	Mangualde	NA
		Granital - Granitos de Portugal, S.A. (EIP Group, 60%)	Quarries at Bardeira, Chacins, Favaco, Maria Ribeira, Pedra da Moura, Pedra do Guarda, Preto F, and Rosa Sta. Eulalia	NA
Petroleum, refined	million 42-gallon barrels	Petróleos de Portugal S.A. (Petrogal) (Galp Energia, SGPS, S.A., 100%)	Refineries at Matosinhos and Sines	120
Pyrite		Minas do Alentejo, S.A. (Almina)	Alentejo	NA
Steel:				
Crude		Siderurgia Nacional S.A. (Metalúrgica Galaica S.A., 100%)	Steelworks at Maia and Seixal	600
Semimanufactured		Lusosider Aços Planos S.A.	Rolling mill at Seixal	550
Stone, dimension	metric tons	Airemármores – Extração de Mármores Lda	Serra de Aire, 6 quarries	7,560
Tin, concentrate	do.	Beralt Tin & Wolfram (Portugal) S.A. (Almonty Industries Inc., 100%)	Panasqueira Mine and plant at Barroca	42
Tungsten, concentrate	do.	do.	do.	1,300
Zinc, ore		Sociedade Mineira de Neves-Corvo (Somincor), S.A. (Lundin Mining Corp., 100%)	Neves-Corvo Mine near Castro Verde	1,000

Do., do. Ditto. NA Not available.