THE MINERAL INDUSTRY OF

AUSTRIA

By Harold R. Newman

Although the mining industry has maintained a long tradition in Austria, the metal mining sector was declining, principally owing to high operating costs, low ore grades, environmental problems, and increased foreign competition. This was not the case with the industrial minerals sector, which has been producing a number of important minerals. Austria has been considered to be a significant world producer of graphite, magnesite, and talc. Recycling activities were also increasing. (See table 1.)

In 1998, graphite, iron ore, magnesite, talc, and tungsten were the main mineral products. Dependent on foreign trade, Austria has had an open economy closely linked to the economies of other European Union (EU) member countries, especially Germany.

In the last several years, the Austrian mineral industry has turned away from coal and base metal mining toward the industrial minerals sector. Most of the growth in the mineral resources area has been in the production of industrial minerals for which operations have been developed by the private sector. All the metal mines, except for the iron ore operation at Erzberg and the tungsten operation at Mittersill, were closed. The Mittersill Mine was reopened in 1995 after being closed for 2 years for economic reasons. Mittersill, together with two graphite mines and a mica operation, represented the underground mining sector. A small portion of the mineral industry was still under Government control. (See table 2.)

All Austria's aluminum produced in 1998 was secondary. The Ranshofen smelter, with a capacity of 50,000 metric tons per year (t/yr), was the larger of two secondary smelters. The Government-owned facility was scheduled to be privatized sometime in the future. The operation consisted of a smelter and casthouse, a rolling mill, a press mill, and an automobile wheel plant. Scrap was obtained from private collecting organizations.

At the smaller Lend smelter, indigenous scrap was augmented with imported ingots, depending on the particular requirements of the finished products. The facility consisted of a 15,000-t/yr smelter, two casthouses, a crucible furnace, three oil-fired furnaces, and a closed furnace. Fuel and compressed air tanks were the main products.

The secondary copper smelter at Brixlegg relied on copper and copper alloy scrap from domestic sources, as well as scrap imports from Germany and Italy.

The Erzberg Mine of Voest-Alpine Erzberg GmbH produced a beneficiated iron ore that was shipped by rail to the nearby steel mills of Voest-Alpine Stahl AG for further beneficiation and production of self-fluxing sinter averaging 50% iron and 3% manganese.

Voest-Alpine Stahl was planning to replace the old existing Donawitz/Leoben steel plants with a clearly structured compact mill in line with state-of-the-art technology. A wider product range could be offered by using fewer aggregates, thus making operations more compact and adaptable. Moreover, material flow would be optimized with regard to logistics and energy consumption. In the future, the crude steel will be processed in a continuous casting plant, which is to be built. The secondary metallurgy facilities would be retained and supplemented by a second ladle furnace. Production capacity would remain unchanged (Voest-Alpine Stahl AG, 1998, Investment package, accessed July 12, 1999, at URL http://www.voest-alpinestahlag.co...ng.asp?sid=147&id=47).

Inmet Mining Corp. of Canada has agreed to sell its wholly owned subsidiary Wolfram Bergbau und Hütten GmbH (WBH) to a private European investment group. The sale, which was scheduled to close in November, apparently ran into financing delays. The group indicated that the sale might be able to go forward by yearend 1998 (Metal Bulletin, 1998).

WBH operated the West's largest tungsten mine at Mittersill and a tungsten conversion plant at Bergla. The Mittersill Mine was an underground open stopping operation, with estimated proven and probable reserves of 6.1 million metric tons (Mt) at an average grade of 0.5% tungsten oxide (WO₃). A scheelite concentrate, about 40% tungsten metal, was produced in a five-stage flotation process, comprising one rougher and four cleaners. Dewatering of the flotation concentrate was carried out by a vacuum drum filter. Negotiations for the extension of the tailings area were successfully concluded, allowing operations to continue for 7 years (Mining Journal, 1998).

Ample supplies of calcite, dolomite, and limestone were available to support a viable cement industry in Austria. The market was fragmented because only two companies had more than one plant. Lafarge Perlmooser AG, the leading cement company, operated two integrated plants at Mannersdorf and at Retznei and one grinding mill at Kirchbichl. Wietersdorfer & Peggauer Zementwerke was next with two plants—one at Carinthia and one at Peggau (International Cement Review, 1998).

Austria was one of the world's largest sources of high-grade graphite. Grafitbergbau Kaiserberg AG operated open pit mines at Kaiserberg and at Trieben. Grafitbergbau's 30,000-t/yr-capacity processing plant at Kaiserberg consisted of drying, classification, milling, flotation, and fine grinding sections. The other company involved in graphite production was Industrie und Bergbaugesellschaft, Pryssok & Co. KG, which operated the Trandorf open pit mine at Mühldorf.

Veitsch-Radex AG (VRAG) was the largest producer of magnesite in Austria. Three of its five mines were active in 1998. With an output of about 400,000 t/yr, Breitenau was VRAG's largest operation. Radentheim, the smallest operation with an output of 80,000 t/yr, produced a high iron magnesite. VRAG's dead-burned magnesia capacity was very large,

exceeding 400,000 t/yr. The iron and steel industry was the largest consumer of VRAG's products.

Austrian salt mines were owned by the Government and regulated by the Ministry of Finance. All salt output was from three underground mines and one brine well in central Austria. The Government was proceeding with plans to privatize the operations.

Luzenac Naintsch AG, the only producer of talc in Austria, operated three mines in the Styria region and produced a range of talc, chloritic talc, dolomite talc, and chlorite-mica-quartz ores. The Rabenwald open pit mine was the largest, with a capacity of about 100,000 t/yr of talc and chloritic talc. The Lassing underground mine had a capacity of 30,000 t/yr, producing a dolomite-talc product with a high degree of whiteness. The Weisskirchen underground mine had a capacity of 30,000 t/yr and produced an ore containing chlorite, muscovite mica, and quartz (Naintsch Mineralwerke GmbH, [1997], accessed July 14, 1998, at URL http://www.techplace.at/info/11067.htm).

In the coal mining sector, the open pit Oberdorf Mine of Graz-Koflacher Eisenbahn und Bergbaugesellschaft GmbH was the only lignite mine with any significant production in 1998. The production of about 1 Mt was used by a local thermal power

station. Output from the only other open pit, the Ampflwang Mine, was negligible. Additional coal for other thermal power stations was imported from Australia and Poland.

Because of Austria's long history of minerals exploration and mining tradition, geologic conditions are fairly well known. Future mining activities will most likely be concentrated in industrial minerals, mainly for domestic consumption. The chances of finding new and workable base metal deposits are probably remote.

References Cited

International Cement Review, [1998], Austria, *in* The global cement report (3d ed.): International Cement Review, p. 58-59.

Metal Bulletin, 1998, Wolfram Berbau sale is delayed: Metal Bulletin, no. 8325, November, p. 9.

Mining Journal, 1998, Inmet sells Austrian tungsten producer: Mining Journal [London], v. 331, no. 8500, October 2, p. 250.

Major Source of Information

Bundesministerium für Wirtschaftliche Angelegenheiten Lansatrasse Haupstrasse 55-57 1031 Vienna, Austria

$\label{eq:table 1} \textbf{TABLE 1} \\ \textbf{AUSTRIA: PRODUCTION OF MINERAL COMMODITIES 1}/$

(Metric tons unless otherwise specified)

Commodity		1994	1995	1996	1997	1998 e
METALS Aluminum metal, secondary		52,500	93,500 r/	97,500 r/	118,800 r/	116,500 2/
Copper:		32,300	93,300 1/	97,300 1/	110,000 1/	110,300 2/
Smelter, secondary		49,562	53,400 e/	65,400 r/	73,000 r/	70,000
Refined:		.,,,,,,,,,	22,.00 0	00,100 1/	70,000 17	70,000
Primary		2,904	530	1,000 e/	2,000 e/	3,000
Secondary		49,562	53,000	57,000 e/	74,000 e/	75,000
Total		52,466	53,530	58,000 e/	76,000 e/	78,000
Gold, metal e/	kilograms	382 2/	100	100	100	100
Iron and steel:						
Iron ore and concentrate:						
Gross weight	thousand tons	1,653	2,116	1,853	1,800 e/	1,400
Fe content	do.	390	709	504	500 e/	380
Metal:						
Pig iron	do.	3,362	3,838	3,416	3,965	4,022 2/
Ferroalloys, electric-furnace e/	do.	12	12	11	11	12
Crude steel	do.	4,405	4,537	4,442	5,196	5,298 2/
Semimanufactures	do.	3,500	3,968	3,837 r/	4,516 r/	4,640 2/
Lead, refined:		418				
Primary Secondary		418 17,165	21,919	22,900	22,700	24,500 2/
Total		17,583	21,919	22,900	22,700	24,500 2/
Manganese, Mn content of domestic iron ore		31,288	42,463	26,000 e/	25,000 e/	24,000 2/
Silver, metal		24		20,000 €/	25,000 €	24,000
Tungsten, mine output, W content of concentrate			738	1,413	680 r/	600
INDUSTRIAL MINERALS				-,		
Cement, hydraulic	thousand tons	4,828	3,843	3,873	3,852	4,000
Clays:		,	•	,	•	,
Ilite	do.	267	277	151	150 e/	150
Kaolin:						
Crude	do.	469	427	180	180 e/	180
Marketable	do.	65	57	60	60 e/	60
Other	do.	2,981	2,900 e/	3,000	2,800 e/	2,800
Feldspar, crude		4,883				
Graphite, crude		12,324	12,019	12,000	12,000 e/	12,000
Gypsum and anhydrite, crude	thousand tons	1,070	958	996	1,000 e/	1,000
Lime	do.	1,850	1,908	1,990	2,000 e/	2,000
Magnesite:		601	704	624	700 /	650
Crude	do.	681	784	624	700 e/	650
Sintered or dead-burned Caustic calcined	do. do.	297 76	272 59	289 52	300 e/ 60 e/	300 60
Nitrogen, N content of ammonia e/	<u>uo.</u>	400	400	400	400	400
Pigments, mineral, micaceous iron oxide e/		8,000	8,000	7,500	7,500	7,000
Pumice (trass)		5,670	6,000 e/	6,000	5,000 e/	5,000
Salt:		3,070	0,000 C/	0,000	3,000 0	3,000
Rock	thousand tons	1	1	1	1 e/	1
In brine	do.	701	523	367	400 e/	400
Sand and gravel:						
Quartz sand	do.	6,457	7,503	6,012	6,000 e/	6,000
Other sand and gravel	do.	19,067	16,048	16,000	18,000 e/	18,000
Total	do.	25,524	23,551	22,012	24,000 e/	24,000
Sodium compounds, n.e.s.: e/						
Soda ash, manufactured	do.	150	200	200	200	150
Sulfate, manufactured	do.	120	100	100	100	100
Stone: 3/			·	·	·	·
Dolomite	do.	8,159	8,790	9,155	9,000 e/	9,000
Quartz and quartzite	do.	416	395	317	282	300
Other:						
Limestone and marble	do.	19,993	19,080	20,000	20,000 e/	20,000
Basalt	do.	4,092	4,202	698	647	650
Marl	do.	2,306	1,931	2,000	2,000 e/	2,000
Crushed stone	do.	11,937	11,299	12,000	12,000 e/	12,000
Total	do.	46,903	45,697	44,170	43,929 e/	43,932

See footnotes at end of table

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

(Metric tons unless otherwise specified)

Commodity		1994	1995	1996	1997	1998 e/
INDUSTRIAL MINERALSCon	tinued					
Sulfur, byproduct:						
Of metallurgy e/		6,500	1,500			
Of petroleum and natural gas e/		9,266 2/	9,000	10,000	9,000	9,000
Total		15,766	10,500	10,000 e/	9,000 e/	9,000
Talc and soapstone, crude		130,602	131,614	130,000	155,730	156,000
MINERAL FUELS AND RELATED MAT	ERIALS					
Coal, brown and lignite	thousand tons	1,368	1,282	1,110	1,122 r/	1,000
Coke	do.	1,328	1,330	1,559 r/	1,567 r/	1,500
Gas, natural:						
Gross	million cubic meters	1,489	1,480	1,400 e/	1,400 e/	1,400
Marketed e/	do.	1,000	1,000	1,000	1,000	1,000
Oil shale		1,146	1,078	498	500 e/	500
Petroleum:						
Crude thous	and 42-gallon barrels	7,671	7,213	7,121	7,200 e/	7,200
Refinery products:						
Liquefied petroleum gas	do.	4,292	6,960	7,416 r/	7,000 e/	7,000
Gasoline	do.	21,598	17,680	19,541	20,120	19,540 2/
Kerosene and jet fuel	do.	2,929	3,309	3,823	3,832 r/	3,960 2/
Distillate fuel oil	do.	9,064	8,736	9,000	9,000 e/	9,000
Lubricants	do.	280 e/				
Residual fuel oil	do.	11,000 e/	11,000 e/	9,510	9,623	9,710 2/
Bitumen e/	do.	1,500	1,500	1,500	1,600	1,600
Unspecified	do.	628	630	600	600 e/	600
Refinery fuel and losses	do.	2,102	2,310	2,200	2,000 e/	2,000
Total e/	do.	53,393	52,125	53,590	53,775 r/	53,410

e/ Estimated. r/ Revised.

^{1/} Table includes data available through May 1999.

^{2/} Reported figure.

^{3/} Excluding stone used by the cement and iron and steel industries.

TABLE 2 AUSTRIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

(Thousand metric tons unless otherwise specified)

	Major operating companies	Location of	Annual
Commodity	and major equity owners	main facilities	capacity
Aluminum	Aluminum Lend GmbH (Salzburger Aluminium AG, 100%)	Secondary ingot plant at Lend	25
Do.	Austria Sekundär Aluminium GmbH (Amag Austria Metall,100%)	Secondary ingot plant at Ranshofen	50
Cement	Lafarge Perlmooser AG (Lafarge France, 100%)	Plants at Mannesdorf and Retsnei,	2,200
		grinding plant at Kirchbichl	
Do.	Wietersdorfer Zemenwerke	Plants at Peggau and Wietersdorf	1,000
Do.	Zementwerk Leube	Plant at Gartenau	700
Do.	SPZ Zemenwerke Eiberg	Plant at Eiberg	600
Do.	Gmundner Zement	Plant at Gmundner	580
Coal	Graz-Koflacher Eisenbahn und Bergbaugesellschaft GmbH	Oberdorf Mine	1,200
	(Government, 100%)		
Copper	Austria Metall AG (Metal Mining Corp. of Canada, 41%,	Plant at Brixlegg	75
	Mount Isa Mines of Australia, 41%, and Government, 18%)		
Graphite	Industrie und Bergbaugesellschaft Pryssok & Co KG	Trandorf Mine at Mühldorf	15
Do.	Grafitbergbau Kaiserberg Franz Mayr-Melnhof & Co	Kaisersberg Mine	3
Do.	Grafitbergbau Trieben GmbH	Trieben Mine	3
Gypsum	Erste Salzburger Gipswerk-Gesellschaft Christian Moldan KG	Abtenau and Moosegg Mines	300
Do.	Rigips Austria GmbH	Grundlsee, Puchberg, Unterkainisch, and	250
		Weisenbach Mines	
Do.	Knauf Gesellschaft GmbH	Hinterstein Mine	160
Iron ore	Voest-Alpine Erzberg GmbH (Government, 100%)	Erzberg Mine at Eisenerz	1,000
Lead	Bleiberg Bergwerks-Union AG (Metall Gesellschaft, 74%)	Smelter at Brixlegg	55
Magnesite	Veitsch - Radex AG	Mines at Breitenau, Hochfilzen, and Radenthein	600
Do.	Radex Austria AG (Osterreichische Magnesit AG, 100%)	Millstatteralpe Mine	250
Natural gas	Osterreichische Mineralolverwaltung AG (Government, 100%)	Fields in Vienna Basin	1,500
million cubic m	neters		
Steel	Voest-Alpine Stahl GmbH (Government, 100%)	Plants at Donawitz and Linz	4,500
Talc	Luzenac Naintsch AG	Mines at Lassing, Rabenwald, and Weisskirchen	160
		Plants at Oberfeistitz and Weisskirchen	
Tungsten	Wolfram Bergbau und Hütten GmbH (Inmet Mining Corp., 100%)	Mittersill Mine, Salzburg; conversion plant, Bergla	350