

TURKEY

By Philip M. Mobbs

Turkey's recent economic and financial crisis had begun in late 2000. It exploded in February 2001, a little more than a year into a 3-year program to end Turkey's three decades of double- and triple-digit inflation. The crisis included a significant devaluation of the lira and soaring interest rates. The country's nominal gross domestic product (GDP) was estimated to be about \$149 billion¹ in 2001 which was a 7.4% decline in real GDP compared with 2000 (International Monetary Fund, 2002a², b²). Total mineral industry revenues (primary and secondary mineral commodity production including cement, glass, refined petroleum products, steel, and certain inorganic chemicals) were estimated to account for about 10% of GDP. Turkey was one of the world's major producer of barite, boron minerals, celestite (strontium), chromite, emery, feldspar, limestone, magnesite, marble, perlite, and pumice and a significant source of processed mineral commodities which included refined borates and related chemicals, cement, ceramics, glass, and steel.

Trade

The economic crisis diminished domestic mineral demand, which increased the attractiveness of minerals and mineral product exports. Total Turkish exports were valued at \$31.3 billion in 2001 compared with \$27.8 billion in 2000 (State Institute of Statistics, 2002³). In 2001, exports of mineral and chemical-based commodities and products included iron and steel bars, which were valued at \$866 million; mineral fuels, oils, and products, \$435 million; jewelry, \$427 million; steel billets, \$336 million; steel pipe, \$285 million; steel wire rod, \$213 million; inorganic chemicals, \$211 million; cold rolled flat steel, \$163 million; hot rolled flat steel, \$158 million; worked marble and travertine, \$158 million; steel sections and profiles, \$116 million; aluminum bars and profiles, \$103 million; borates and concentrates, \$101 million; and copper wire, \$99 million (Istanbul Mineral and Metals Exporters' Association, 2002a, p. 50; b, p. 39; c, p. 46-47).

Commodity Review

Metals

Aluminum.— In 2001, Eti Holding A.Ş. revived plans to expand the production capacity of the Seydisehir aluminum smelter to 110,000 metric tons per year (t/yr) from the existing capacity of 60,000 t/yr. The modernization had been estimated to cost about \$300 million in 1997, when it was initially proposed (Mining Journal, 2001). The Kibar Group proposed to increase aluminum foil and sheet production at its Assan aluminum mill in Tuzla.

¹Where necessary, values have been converted from Turkish lira to U.S. dollars at the average rate of TL1,240,942=US\$1.00 for 2001 and TL624,754=US\$1.00 for 2000.

²References that include a section twist (§) are found in the Internet References Cited section.

Copper.—By March, operations had resumed at Çayeli Bakir Isletmeleri A.Ş., the joint venture of Inmet Mining Corp. (49% equity interest), Eti Holdings A.Ş. (45%), and Gama Endüstri (6%). Lower copper grades and a labor strike that had begun in December 2000 resulted in a decline in copper production at the mine to 33,000 metric tons (t) in 2001, compared with 37,400 t in 2000. Production of zinc (in concentrate) declined slightly to 25,300 t in 2001, compared with 26,000 t in 2000. In December 2001, Gama agreed to sell its interest in Çayeli to Inmet. During 2002, Çayeli planned to complete a \$5 million tailings pipeline, to initiate a \$2.2 million upgrade in the plant's crushing and filtration capacity, and to initiate a proposed doubling of the mine shaft depth (Inmet Mining Corp., 2002, p. 16-18).

Gold.—In July, Normandy Madencilik A.Ş. (a subsidiary of Normandy Mining Ltd. of Australia) began mining the Ovacık deposit near Bergama. The mill had begun treating stockpiled ore in June. In 2001, about 175,800 t of ore was treated; gold production was more than 1,500 kilograms (Normandy Mining Ltd., 2001a, b; 2002). Initial ore production was by open pit with subsequent underground operations planned.

Yeni Anadolu Mineral Madencilik San. ve Tic. Ltd. Şti. (YAMAS) (a subsidiary of Anatolia Minerals Development Ltd. of the United States) reported extensive exploration activity in Turkey, which included drilling, geophysical studies, soil sampling, and trenching. In 2001, the Rio Tinto Mining and Exploration Ltd. joint venture with Anatolia incurred exploration expenditures on the Çükürdere (also known as the Cöpler), the Kabataş, the Karagöz, the Kirlangiç, and the Üçkapılı properties and other properties in the Ktabataş District.

A prefeasibility study of the Kisladağ gold prospect was completed for Tüprağ Metal Madencilik San. ve Tic. Şti., which was a subsidiary of Eldorado Gold Corp. of Canada. Tüprağ continued to drill the Kisladağ and the nearby Sayacık gold prospects.

Steel.—In February, the Government approved the acquisition of Iskenderun Demir ve Çelik A.Ş. (Isdemir) by Ereğli Demir ve Çelik Fabrikaları T.A.Ş. (Erdemir); however, issues concerning Isdemir's debt delayed the takeover. Isdemir had been operating under the control of the Government's privatization organization since 1998. Erdemir also started a \$72 million, 250,000-t/yr capacity galvannealing line at its Ereğli plant in 2001 (Metal Bulletin, 2001a). In November, the 2.2-million-metric-ton-per-year (Mt/yr)-capacity Çukurova Çelik Endüstri A.Ş. steel facility in Aliğa was sold to Ege Çelik (Metal Bulletin, 2001b).

Industrial Minerals

Boron.—Eti Bor A.Ş. proposed to build a \$30 million, 160,000 t/yr borax pentahydrate plant to supplement output from the plants at Bandırma and Kirka. Eti Bor also proposed to build an \$80 million, 100,000 t/yr boric acid facility at Emet

and to expand the Bandırma boric acid facility to 60,000 t/yr from 45,000 t/yr (Industrial Minerals, 2001; Eti Holding A.Ş., 2002§).

Sulfur.—Eti Holding issued a \$76 million contract for the construction of a new 240,000 t/yr sulfuric acid plant at Bandırma. Operations to begin in 2003 with output from the pyrite-burning plant were to be used in the production of boric acid (SNC-Lavalin Group Inc., 2001; Eti Holding A.Ş., 2002§).

Zeolite.—Clinoptilolite was the predominant zeolite mineral produced in Turkey, especially in the Gördes area, about 130 km northeast of Manisa. Turkish zeolite mining or marketing companies included the Agricola Metals Corp., the Enli Mining Co., and Rota A.Ş. In 2001, Eti Holding revived plans for a synthetic zeolite plant at the Seydisehir aluminum facility, which had been proposed in 1996. Eti Holding's subsidiary (Eti Zeolit A.Ş.) proposed to produce 50,000 t/yr of Zeolite 4A for the domestic detergent market (Eti Holding A.Ş., 2002§).

Mineral Fuels

In 2001, Turkey imported about 90% of its crude oil demand, compared with 89% in 2000. In 2001, 31 exploration and appraisal wells were drilled in Turkey. Most of Turkey's oil exploration and production were in the southeastern region. Crude oil production by the state-owned Türkiye Petrolleri A.O. (TPAO), which was the country's largest oil producer, continued to decline. In 2001, TPAO's domestic production was down to about 12.3 million barrels (Mbbbl) from 13.6 Mbbbl in 2000 (Turkish Petroleum Corp., 2002§).

By 2004, TPAO proposed to build the country's first natural gas storage facility at Silivri in western Turkey. A second storage facility was proposed for Tuz Golu in central Turkey. In May, the Government promulgated the Natural Gas Market Law, which deregulated the natural gas market and eliminated the monopoly on natural gas imports formerly held by Boru Hatları ile Petrol Tasımaları A.Ş. (the state pipeline company).

The Government's oil refining company, Türkiye Petrol Rafinerileri A.Ş., proposed \$800 million of improvements to its refineries, which included diesel/kerosene hydroprocessing and sulfur recovery at the Izmit refinery and diesel desulfurization units at the Izmir, the Izmit, and the Kirikkale refineries (Middle East Economic Digest, 2001).

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Major Sources of Information

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

(Metric tons unless otherwise specified)

Commodity	1997	1998	1999	2000	2001 e/
METALS					
Aluminum:					
Bauxite 3/	369,482	458,028	207,743	458,537	242,000
Alumina, gross weight:	164,333	156,825	159,122	155,448	100,000
Metal, smelter e/	62,019 4/	62,000	62,000	61,000 r/	61,000
Antimony: e/					
Ore, mine output:					
Gross weight	585 4/	500	3,400	6,800	7,000
Sb content	31 4/	30	180	360	370
Concentrates:					
Gross weight	500 4/	100	500	1,000	1,000
Sb content	125 4/	20	100	200	200
Cadmium	89	69	64	--	--
Chromite, gross weight (34% to 43% chromic oxide) 5/	1,702,623	1,404,470	770,352	545,725	389,759 4/
Copper:					
Mine output (exclusive of pyrite): 6/					
Gross weight	3,797,874	4,052,175	4,297,170	4,473,711	3,000,000
Cu content of ore	36,460	40,000 e/	73,051	76,053	52,000
Metal:					
Smelter output (primary and secondary)	32,491	35,000 e/	19,159	954	24,000
Refined e/	111,400	91,800	78,000	78,000	78,000
Gold e/ 7/ kilograms	1,000	1,000	1,200	500	2,000
Iron and steel:					
Iron ore:					
Gross weight thousand metric tons	5,986	5,885	4,846 r/	4,076 r/	3,932 4/
Fe content e/ do.	3,239 4/	3,200	2,300	2,450	2,400
Metal:					
Pig iron and ferroalloys:					
Ferrosilicon	108,320	110,175	99,100	97,240	50,735 4/
Ferrosilicon	4,730	4,810	420	--	--
Pig iron	577,427	456,465	314,670	300,000 e/	300,000
Steel, crude including castings thousand metric tons	13,644	13,351	14,309	14,325	14,900
Lead:					
Mine output, Pb and Pb-Zn ores:					
Gross weight	262,260	292,065	284,504	345,391	346,000
Pb content	13,113	13,500 e/	14,225	17,270	18,000
Concentrates: e/					
Gross weight	12,063 4/	12,100	11,500	13,000	13,000
Pb content	7,912 4/	7,900	7,500	8,500	8,500
Metal, refined e/	7,000	8,000	4,000	4,000	4,000
Manganese ore, gross weight 8/	31,160	53,283	29,000	23,300	23,000
Silver, mine output, Ag content e/ 9/ kilograms	90,200	110,000	100,000	110,000	100,000
Zinc:					
Mine output, Zn and Pb-Zn ore:					
Gross weight	79,035	45,795	4,630	861 r/	816
Zn content	11,255	6,000 e/	545	39 r/	37
Concentrates: e/					
Gross weight	7,525 4/	5,000	500	26 r/	25
Zn content	4,169 4/	3,000	300	26 r/	25
Metal, smelter, primary	37,074	35,716	33,179	--	--
INDUSTRIAL MINERALS					
Aluminum sulfate (alunite)	8,323	10,624	11,264	12,266	12,000
Barite, run of mine	226,594	160,042	150,058	120,893	100,000
Boron minerals:					
Run of mine	2,602,386	2,754,082	2,554,404	2,398,220	2,500,000
Concentrates e/	1,568,571 4/	1,650,000	1,500,000	1,450,000	1,500,000
Cement, hydraulic thousand metric tons	36,035	38,200	34,258	35,825	35,000
Clays:					
Bentonite	521,158	565,708	899,614	636,273	600,000
Kaolin	472,646	403,733	449,954	595,415	600,000
Other e/	6,400,000	6,000,000	6,000,000	6,500,000	6,000,000
Emery	12,345	19,027	14,535	16,830	17,000
Feldspar, run of mine	1,011,542	1,089,483	1,369,655	1,147,716	1,200,000

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	1997	1998	1999	2000	2001 e/
INDUSTRIAL MINERALS--Continued					
Fluorspar	5,000 e/	5,000 e/	4,812	4,113	4,100
Glass, crude	1,369	1,410 e/	1,203	1,300 e/	1,200
Graphite, run of mine e/	15,000	15,000	15,000	15,000	15,000
Gypsum, other than that for cement	413,802	351,557	242,960	302,552	300,000
Lime 10/	1,170	1,066	975	914	1,000
Magnesite, run of mine	1,409,768	2,703,343	1,724,744	2,672,089	2,500,000
Meerschaum e/	400 4/	400	400	500	400
Nitrogen, N content of ammonia e/	558,000	560,000	82,400	53,400	50,000
Perlite, run of mine	103,416	124,312	147,818	149,429	150,000
Pumice	681,000 11/	579,000 11/	950,189	787,081	700,000
Pyrites, cupreous, gross weight	559,500	699,408	896,519	561,565	300,000
Silica sand, gross weight	843	1,138	1,211	1,485	1,400
Sodium compounds:					
Salt, NaCl, all types	2,344	2,170	2,146	2,126	2,100
Soda ash (trona) e/	500 4/	500	500	500	500
Sodium sulfate, concentrates	300,000 e/	300,000 e/	438,069	456,590	450,000
Stone:					
Dolomite	689,989	829,775	921,105	957,182	950,000
Limestone, other than for cement	49,108	52,355	28,045	30,295	30,000
Marble	433,517	633,432	739,240	647,160	650,000
Quartzite	1,878,339	2,301,270	2,514,383	2,743,271	2,500,000
Strontium minerals, celestite: e/					
Run of mine	50,000	50,000	40,000	40,000	40,000
Concentrates	30,000	30,000	25,000	25,000	25,000
Sulfur: e/					
S content of pyrites	63,000	--	45,000 r/ 4/	26,000 r/ 4/	30,000
Byproduct:					
Petroleum	46,000	54,000	47,000	43,000 r/	51,000
Other	91,000	91,000	75,000	75,000 r/	75,000
Total	200,000	145,000	167,000 r/	144,000 r/	156,000
Talc	4,000 e/	5,000 e/	48,378	54,278	50,000
MINERAL FUELS AND RELATED MATERIALS					
Asphalt, natural e/	117,310 4/	157,334 4/	150,000	150,000	150,000
Carbon black	39,061	39,971	26,379	35,144	35,000
Coal:					
Hard coal, run of mine	3,646	3,336	2,738	3,330	3,300
Lignite, run of mine	56,780	66,499	66,706	61,315	60,000
Coke and semicoke	2,335	2,144	2,811	2,090	2,000
Gas:					
Natural, marketed	250,804	561,995	718,806	611,822	600,000
Coal, manufactured e/	35,000	15,000	--	-- 4/	--
Petroleum:					
Crude	24,696	23,072	21,157	19,783	18,370 4/
Refinery products:					
Liquefied petroleum gas	8,418	8,774	8,071	7,409	8,000
Gasoline	33,067	31,673	38,096	39,889	25,000
Naphtha	13,644	15,917	16,106	15,717	17,000
Jet fuel	13,445	13,767	11,883	11,009	9,500
Kerosene	578	583	730	638	200
Distillate fuel oil 12/	55,248	59,860	69,551	70,333	55,000
Lubricants	4,177	4,714	4,501	4,322	3,900
Residual fuel oil	48,012	44,818	9,512	8,769	48,000
Asphalt	8,029	10,912	7,635	7,764	6,700
Unspecified 13/	33	26	1,644	3,110	18,000
Total	184,651	191,044	167,729	168,960	191,000

See footnotes at end of table.

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

e/ Estimated. r/ Revised. -- Zero.

1/ Table includes data available through December 31, 2002. Large quantities of construction materials (clay, sand, and gravel) are quarried. Also mined are basal diabase, granite, onyx, sandstone, serpentine, slate, and travertine for building stone, limestone and gypsum for cement manufacture, and zeolite, but information is inadequate to estimate output.

2/ Estimated data are rounded to no more than three significant digits; may not add to totals shown.

3/ Data are for public sector only. Data for private sector production are not available, but production is believed to be approximately 30,000 metric tons per year.

4/ Reported figure.

5/ Approximately 70% of gross production is salable product. Previously reported estimates of salable product in metric tons: 1996--900,000; 1997--1,300,000; and 1998--1,000,000.

6/ Copper mines produce a copper concentrate (of about 22% Cu) and a cupreous pyrite concentrate (about 0.7% Cu). Copper is not recovered from the cupreous pyrite concentrate.

7/ Data includes estimated content of Turkish copper refinery tankhouse slimes. Prior to 2001, all gold production was the byproduct of base metals refining.

8/ Does not include manganese iron ore from the Devceci Mine, production of which amounts to several hundred thousand tons per year and has a manganese content of 3% to 5%.

9/ Includes estimated content of base metals refinery tankhouse slimes.

10/ Data are lime produced for steel production and do not include the widespread artisanal production of lime for whitewash and sanitation purposes.

11/ Turkish pumice production was officially reported in cubic meters and has a density reported to range from 0.5 to 1.0 metric ton per cubic meter. Values in this table have been converted by using 1 cubic meter=0.75 metric ton.

12/ Diesel fuel (gasoil) and special heating oil.

13/ Includes refinery fuel and losses.