

Mineral Industry in Turkey

G. Önal

**Istanbul Technical University Faculty of Mines Head of Mining Engineering Dept.
34469 Istanbul-Turkey, onalg@itu.edu.tr*

INTRODUCTION

Turkey is a semi-arid plateau between the Eurasian and the African continents. With its surface area of 780 thousand sq km, it supports a population of 70 million people. While the mining history of Turkey can be traced back as far as 7 000 B.C., mining currently generates only 1.4 % of Turkey's gross national product.

There are 77 different economical minerals in Turkey. Turkey stays on the first lines in the world with the reserves of boron, zeolite, and pumice and has also significance reserves of trona, thorium, rare earths, proffillite, celestite, barite, feldspar, chromite, copper, lead, zinc, magnesite, gold, coal, marble and ornamental stones. There are 30.000 licenced mines among which 2800 are in operation.

Total mineral production of Turkey in 2004 is about 78.6 million tons/year. Additionally, 60 million tons of lime stone and agregate are produced. The total value of mineral production in 2004 is about 3.8 billion US dollars/year and 1.2 billion US \$ are exported in 2004. Ornamental stones and Boron minerals takes the first place in mineral export.

Table 1: The Known Mineral Reserves of Turkey

Type of Mine		Reserve (Tons)
Coal	Lignite	9.260.000.000
	Bituminous Coal	1.100.000.000
Boron		3.071.500.000
Quartz		1.307.414.250
Trona		800.000.000
Feldspar		500.000.000
Aluminium		400.000.000
Chromite		300.000.000
Clay		75.000.000
Barite		20.000.000
Magnesite		15.000.000
Zinc (Zn metal)		5.149.600
Lead (Pb metal)		3.252.000
Copper (Cu metal)		1.697.204
Celestite		30.000
Silver (Ag metal)		6740
Gold (Au metal)		575

Table 2: Important Mineral Reserves of Turkey in the World and their Order

Mine	Share in World Reserve (%)	World Order
Boron	65	1
Zeolite	7	1
Pumice	10	1
Trona	60	2
Thorium	8	2
Rare Earths	12	2
Pirofillite	20	2
Feldspar	10	3
Celestite	11	4
Barite	8	4
Asbest	5	4
Chromite	3,5	4
Magnesite	3	4
Antimony	5,5	5
Marble	5	6
Wolframite	2,5	8
Boksite	1,9	8
Gold	1	10
Copper	1,2	10
Lead	0,8	10
Zinc	0,5	10
Lignite	0,2	12
Bituminuos Coal	0,02	28
Kaolin	0,7	30

Table 3: Turkey's Boron Reserves

Production Place	Ore	Reserve (million tons)	Reserve on the basis of B ₂ O ₃ (million tons)	B ₂ O ₃ Content (%)
Kırka Boron Company	Tincal	604	156	26-27,5
Bigadiç Boron Company	Ulexite	49	14	28-30
	Colemanite	576	167	28-30
Emet Boron Company	Colemanite	835	225	26-28
Kestelek Boron Company	Colemanite	7	2	29-31
Total		2.071	564	

TÜRKİYE MADEN YATAKLARI

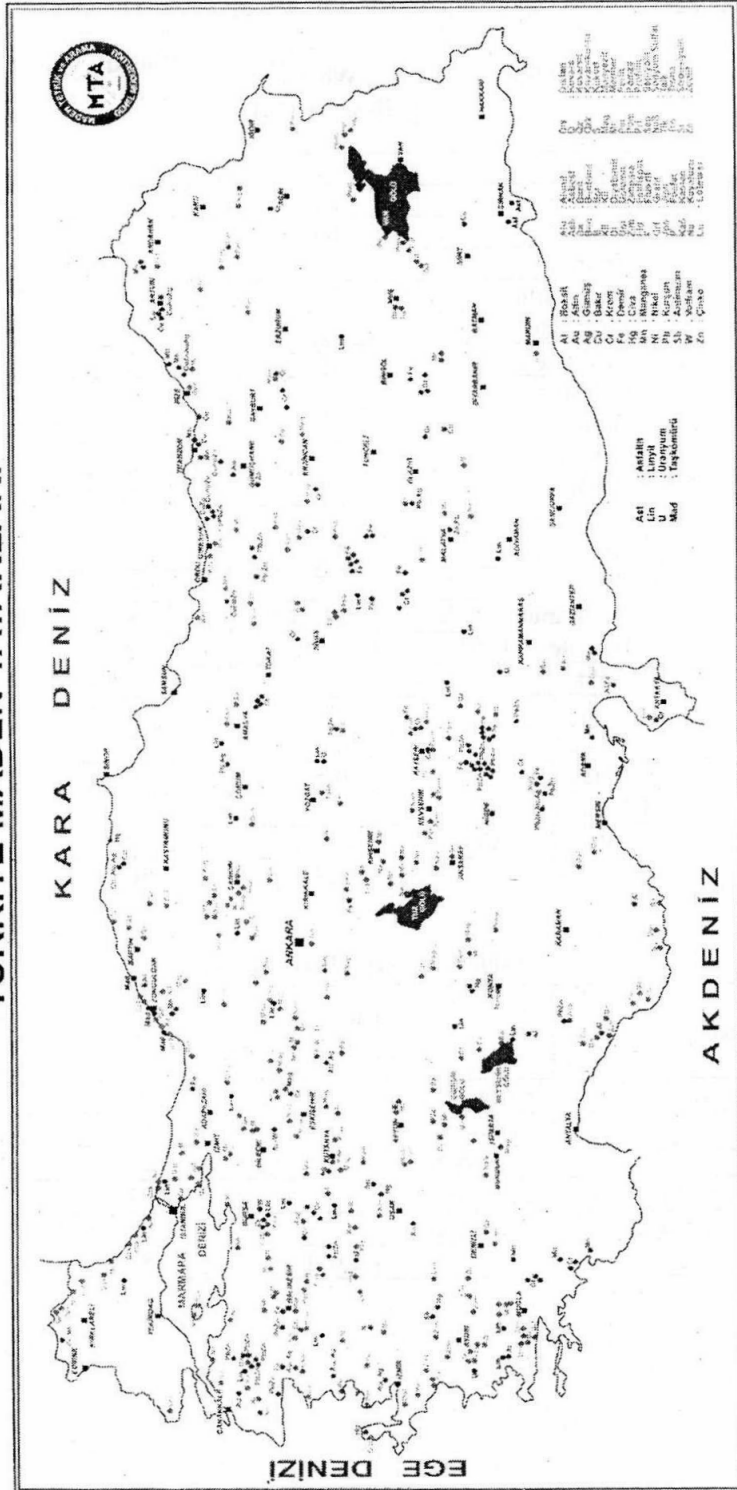


Fig. 1: Mining Map of Turkey

Table 4: Mineral Production of Turkey in 2004

Mine		Production (tons)
Limestone+Aggregate		60.000.000
Coal	Lignite	47.200.000
	Bituminous Coal	2.100.000
Iron Ore		4.000.000
Copper Ore		4.000.000
Feldspar		3.000.000
Marble		2.500.000
Salt		2.000.000
Boron Ore		2.500.000
Clay		1.500.000
Quartz		3.000.000
Pumice		1.200.000
Boksite		400.000
Chromite		700.000
Magnesite		2.700.000
Dolomite		1.000.000
Perlite		150.000
Barite		150.000
Celestite		60.000
Lead-Zinc		350.000
Silver (Ag metal)		90
Gold (Au metal)		6

Table 5: Turkey's Mineral Export in the Last 5 Years

Years	Amount Exported, tons	Export income, US \$
2000	5.649.341	568.945.000
2001	6.171.077	572.883.000
2002	6.896.936	684.660.000
2003	8.836.600	847.881.000
2004	11.127.546	1.207.807.000

CONCLUSIONS

- Turkish mineral production is not in accordance with its reserves. Today's production can be increased at least as four times.
- According to a strategic study, it has been assumed that the share of mining in gross national income will increase to 3% within the next 10 years (from its current figure of 1.4 %), to 5% within the next 20 years, and the yearly development rate will be 6%. Similarly, with 8 billion USD investment 63, billion USD worth of mine production will be realized within the next 10 years, 21 billion USD of which will come from exports. In the second 10 years, 21.9 billion USD investment will cause a 216 billion USD mineral production, 103 billion USD of which will come from exports. In another words, yearly mining income will rise to 11 billion USD (4.6 USD of which is due to exports) at the end of first 10 years, while it will be 34.2 billion USD (17.3 billion USD of which belongs to exports) by the end of next 20 years.
- Turkey is open to foreign investments in all scales, for exploration and production in mining. As example, in last ten years, 9 feaseable gold mine were found by foreign companies and one of them is in operation since 3 years which produces 3.5 tons/year gold and 4 tons/year silver.