

MINERAL INDUSTRY IN TURKEY

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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 economic 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, profillite, 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 limestone and agrega are produced. The total value of mineral production in 2004 is about 3.8 billion US dolars/year and 1.2 billion US \$ are exported in 2004. Ornamental stones and Boron minerals takes the first place in mineral export.

TÜRKİYE MADEN YATAKLARI



Asf : Asfaltit
 Lin : Linyit
 U : Uranyum
 Mad : Taşkömürü

- | | | |
|---------------|----------------|---------------------|
| Al : Boksit | Alu : Alunit | Dis : Disten |
| Au : Altın | Asb : Asbest | Q : Kuvars |
| Ag : Gümüş | Ba : Barit | Oz : Kuvarskumu |
| Cu : Bakır | Ben : Bentonit | S : Kukurt |
| Cr : Krom | B : Bor | Mag : Manyezit |
| Fe : Demir | Kil : Kil | Mr : Mermer |
| Hg : Cıva | Di : Diyatomit | Per : Perlit |
| Mn : Manganez | Dol : Dolomit | Pom : Pomza |
| Ni : Nikel | Zim : Zimpara | Prf : Profilit |
| Pb : Kurşun | F : Feldispat | Seg : Sepiyolit |
| Sb : Antimon | Gf : Granit | NaS : Sodyum Sülfat |
| W : Wolfram | Jps : Jips | Tk : Talk |
| Zn : Çinko | P : Fosfat | Tro : Trona |
| | Kao : Kaolen | Sr : Stronsiyum |
| | Na : Kayatuzu | Ze : Zeolit |
| | Lu : Lületaşı | |

Mining Map of Turkey.

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 |

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 |

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 | |

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 |

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 line 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

Thank you for your attention...