

Mining in Turkey

While Europe has consumed most of its mineral wealth, Turkey has only explored 40% of its resources

A REPORT BY GBR FOR E&MJ

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Mining in Turkey: Digging for the Future



Exploration is the key as Turkey prepares for a mining transformation.

With evidence of mining dating back several thousand years and a complex geology reflected in the amazing diversity of its industrial mineral deposits and varied base metal reserves, it comes as a surprise to learn that the modern mining industry in Turkey is in its infancy and was born only in 1935. Indeed, it was the sweeping economic reforms carried out by Mustafa Kemal Atatürk, founder of the Turkish Republic and its first president that set in motion the wheels of change. Atatürk's vision was to create a sector that could support the nation's burgeoning economy and supply it with natural and financial resources, the driving forces of industrialization. It was with this in mind that he created state owned

giants such as the General Directorate of Mineral Research and Exploration (MTA), responsible for exploring and finding new reserves, and Eti Bank (now Eti Mine), which has a monopoly over boron mining and processing.

Over the last 70 years or so, the industry has grown rapidly, particularly after 1993, thanks largely to increased domestic and world demand. Turkey now ranks as one of the world's most promising and dynamic mining destinations, with an increasing number of local and foreign players playing an active role in exploiting the significant potential that lies beneath the surface. Zeki Sayılır, marketing director of Inmet Mining (known as Çayeli in Turkey), a Canadian global mining firm based in Toronto

involved in the production, development and exploration of copper, zinc and gold stresses: "I certainly believe that Turkey does present enormous opportunity. The potential here, starting with gold mining and boron and expanding into copper, zinc and lead is very large. This is especially important when the scarcity of raw materials is getting acute."

It is this point that is critical for Turkey's future growth. With mineral resources fully explored and consumed in Europe, one's attentions turn to Turkey as a secure and important supplier of minerals to the continent. İsmet Kasapoğlu, chairman of the Turkish Mining Assembly, whose charter is to represent the interests of the mining sector and all those involved in the

industry and which is part of The Union of Chambers and Commodity Exchanges of Turkey said, "Turkey does have one important advantage. Whereas Europe has explored and consumed all of its resources, Turkey has only explored 40% of its mining capabilities. As such, we are hopeful of finding new, valuable resources. We can look forward to the future."

Statistics from the State Planning Organization demonstrate that the mining sector's share of GNP increased from 1.13% in the year 2000 to 1.15% in the first six months of 2007.

Yet, perhaps more indicative of the industry's recent performance and growth are its exports. Istanbul Mineral and Metals Exporters' Association (IMMIB) figures show that mineral exports amounted to \$532 million in 1998, or 1.97% of total exports. In 2007, they stood at \$2.72 billion (or 2.55% of all exports)—a staggering increase. Certainly, the industry has experienced heady growth over the last 10 years. Between 2006 and 2007, exports grew by more than 30%, for example. The overwhelming majority of these mineral exports head to the EU.

Today, the minerals industry is one of Turkey's leading sectors and it has been proven that there are 4,400 mineral deposits in the country, excluding coal and petroleum.

The government recognizes the potential that the mining industry presents for the Turkish economy. Over the last 20 years, bureaucratic red tape has lessened and the legal structure improved dramatically. Economic reforms in the 1980s resulted in widespread privatization and a new mining code was enacted in June 2004 to encourage the development of the sector. Certainly, the government has taken the necessary steps to ensure that firms operating in the sector are fully able to easily exploit potential resources and to invest effectively in building viable organizations, with modern, world-class structures, capable of competing against foreign firms.

Keen to capitalize on Turkey's potential and spurred by an investor friendly business environment; foreign mining firms have taken steps to set up operations in the nation, especially in gold mining. Today there are around 20 to 25 Canadian, U.S., U.K. and Australian

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mining companies present in Turkey, impacting significantly on the sector. Turkish firms who perhaps lack international experience and operating standards can learn much from their foreign counterparts. Foreign firms are bringing experience into the country, forming partnerships with local companies and in turn are pushing the industry forward at a pace previously unseen.

In short, Turkey is rapidly transforming itself into a viable and powerful mining nation where investors can find a multitude of companies, both local and foreign, operating to international standards. And with an industry whose contribution to the country's GNP is increasing by the year, the mining sector is proving that it could one day be the economy's backbone.

Strength in Minerals

An estimated 2.5% of the world's industrial minerals, vast and incredibly varied reserves, comprised of 53 different minerals make Turkey a world premier destination for mineral mining and the country is considered by Kasa-poğlu, to be one of the world's top 10 mineral producers. While many of the minerals are found in moderate quantities, Turkey up until recently possessed more than 63% of the world reserves of boron, equivalent to 1.8 million tons—enough to supply the world's markets for 500 years.

With the recent discovery of 3 billion tons of reserves in the Bigadiç-Emet-Kirka-Kestelek boron basin, Turkey is now home to 72% of the world's boron reserves. The country is also a world leader in the production of feldspar (Turkey houses 10% of world reserves), magnesite, bentonite and perlite, of which Turkey is home to half of the world's reserves.

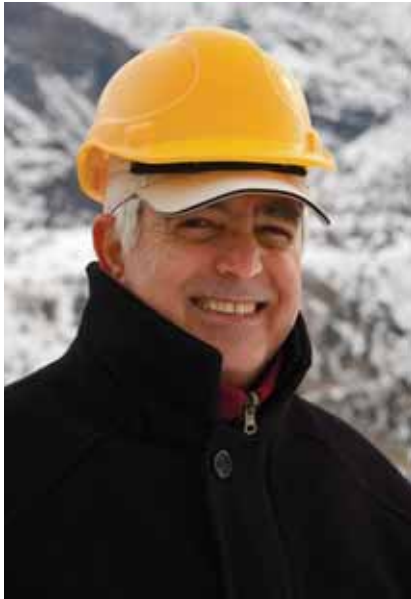
As mentioned previously, Eti Maden maintains control over boron production. In 2006, the firm produced 36.5% of the world's boron. From the years 2002 to 2006, exports increased by an amazing 96%, from \$186 million to \$365 million. By pursuing dynamic market research, Eti Maden aims to dominate the world's boron market by increasing its market share to 50% and push export figures to \$600 million.

It is the nation's strength in industrial minerals that is attracting the attention of the mining community and there

are many players willing to stake their fortunes on such commodities. One such local player is Eczacıbaşı Esan, part of one of Turkey's largest industrial holdings, with interests ranging from the construction industry to pharmaceuticals. Within three decades, it has become a well known industrial mineral producer, both in Turkey and abroad, serving mainly the ceramic industry and is considered one of Turkey's three largest producers of feldspar with production increasing from 600,000 tons in 2003 to more than 1.5 million tons in 2007. All in all, Eczacıbaşı Esan holds around one third of the 239 million tons of proven reserves of feldspar in Turkey. All of this translates into substantial revenues. Indeed, the importance of industrial mineral production to the group becomes apparent when looking at recent growth figures. When they merged Eczacıbaşı Esan with their mineral trading arm, Doğa Minerals, in 2003, turnover from industrial mineral sales totaled \$40 million. In 2007, it stood at three times that amount, a staggering increase which reflects the popularity of and the rise in demand for Turkey's minerals.

The company has plans to further expand its production by acquiring concessions in nearby countries. "We have expanded our production of refined ball clay, from 20,000 to 75,000 tons," said General Manager Sinan Özman. "This expansion has been carefully calculated, in order to avoid having an overcapacity problem we increase production depending on the demand. In September 2006, we started producing quartz with a new plant, to exploit our good quality quartz deposits of 5 million tons. We have already sold about 60,000 tons of granulated and micronized quartz, both to Turkey and other countries. Last year we also began production of bentonite, with 20,000 tons. We are planning to obtain some exploration licenses in the Ukraine in order to set up a refined kaolin plant." The aim of these ambitious expansion plans is "to become a one-stop shop for the ceramic sector, and to be close to our customers."

Boron aside, Turkey shines in its production of natural stone, particularly marble. With a 40% share of the world's reserves, totaling a probable 5 billion m³ and production that is increasing by 20% a year, and an annual production of



Sabri Karahan, general manager of Teck Cominco for 10 years, currently general manager of Dama Engineering.

1.5 million tons in 2006, and 13 million m² of slab and tiles, some believe that Turkey will overtake Italy as the world's top producer of marble in the next three to five years. Sabri Karahan, general manager of Dama Engineering, a firm

servicing the mining industry with both grassroots and advanced exploration work as well as with process development and engineering projects states that, "We have vast amounts of marble. Ten years ago we were exporting \$10 million worth of marble. We now export more than \$1 billion." This figure includes \$736 million for processed marble and \$244 million for block marble. Turkish marble is exported the world over and is experiencing strong demand from the likes of China. In 2005, Turkey was ranked third in raw block marble exports in the world with a share of 14%. With advanced processing techniques and capacity, Turkey is one of the world's important natural stone centers with world famous varieties like Tigerskin, Elazig Cherry, Marmara White and Afyon White, to name only four of the 100. Gradually, people are beginning to recognize that the nation is able to supply the world with high quality stones and many are now beginning to value Turkish marble alongside the likes of Italian, Spanish and Portuguese.

Industrial minerals have given rise to a plethora of local mining players

and have helped create a vibrant and dynamic industry with world-class competencies. And with many more deposits yet to be discovered, industrial minerals are perhaps the bread and butter of the Turkish mining industry. All of the local firms (foreign operators focus on precious and base metals) involved in the mining and processing of such commodities are taking ambitious steps to improve and increase their production and are slowly beginning to make bold moves outside of the country's borders. Those that aren't as yet, have plans to do so in the future.

"We are very small. We need to improve our mining operations here before moving abroad," said Özcan Yavuz, CEO of Gençler Mining, a firm established in 1992 to explore and process industrial minerals such as bentonite and barite and base metals such as copper and chrome ore. With 95% of production exported and a turnover of \$6 million, industrial minerals (and base metals) are, as Yavuz puts it: "our bread and butter." They have 2 million tons of 2.5% copper reserves at their site in Eastern Turkey and an equal

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amount of chrome ore. "We would like to continue our projects. You need to make large investments in mining, especially in base metals mining. In our copper mining project we are going to spend \$6 million over the next two years," said Yavuz.

This willingness and thirst to improve is commonplace in Turkey. Flush with the many opportunities that exist within their own borders, a mineral base that can support their growth, Turkish mining firms all have their sights set on bigger things. They have realized the importance of working to international standards and are addressing the most critical processes in their organizations.

Non-Ferrous Metals


In addition to industrial minerals, both the local and international mining community can look to Turkey for sizeable base metal reserves, though these are nowhere near as large as with industrial minerals and Turkey cannot even be considered as one of the world's top 20 producers. Yet, reserves are varied. As



Mehmet Yilmaz, geological engineer, director of Tüprag, Eldorado Gold subsidiary in Turkey.




much as 65% of Turkey's surface is suitable for gold exploration and considerable reserves are present in Western Anatolia. These are being explored and exploited mostly by foreign firms who have come to Turkey safe in the knowledge that the nation represents untapped potential.

"Turkey has reserves of very different types of base metals: lead, zinc, copper, antimony and nickel, to name but a few. The production of these metals will increase, especially in lead, zinc and copper. The Biga Peninsula, which is located in northwestern Turkey, offers very good opportunities, as it is an area in which no geologist was previously interested," said Bahri Yıldız, general manager of Stratex, an exploration company targeting base metal and gold deposits. This point is critical. Whereas mature mining markets such as Australia, South Africa, Canada and the United States have been explored and exploited, much of Turkey remains untouched. This potential leads commentators to believe that in the next five to 10 years, the industry, including industrial minerals, could be 10 times larger. When considering recent export figures, this is not an unrealistic expectation. Between 2004 and 2006, chrome ore exports increased from \$61 million to \$120 million, or a jump of 575 million tons to 1,080 million. The same is true for



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copper ore, the export of which climbed dramatically from 575 million tons in 2004 (or \$82 million) to 169 million tons (or in monetary terms, \$184 million) as well as zinc, Turkey's third most important metal export. Data from 2004 reveals that exports totaled 111 million tons (\$28 million) and in 2006, that figure had increased to 254 million tons (\$139 million).

As with industrial mineral investment, those involved in base metal processing are adamant that the future of the industry is assured. Eti Copper, a recently privatized copper producer has plans to expand its antimony mine to 5,000 tons a year, from the current 1,000, for example.

Following suit, Dedeman also plans to expand. Entering the mining business in 1947, Dedeman is involved in chrome, lead, zinc and copper mining. Considered a pioneer of private mining, formed at a time when public enterprises dominated the Turkish market, the company has evolved into a national behemoth. Though involved in a variety of industries, including a highly profitable tourism business, mining generates 40% of the group's turnover. Today the firm produces 525,000 tons of chrome ore a year from their mines in both the Kayseri and Adana regions. This production of raw material translates into 80,000 tons of chrome concentrate. Their lead and zinc mines currently produce 90,000 tons. Having long recognized the importance and profitability of mining, Dedeman is continuously investing in expanding their activities in order to increase their saleable production. They recently acquired new licenses for chrome and have made moves to further their production of zinc. They have also invested in four copper concessions at which they will begin exploring in the spring.

A couple of smelter projects in the pipeline will add to Dedeman's capabilities. The first is a high carbon ferro chrome smelter, for which the projection is 10,000 tons of FeCr per year. They plan to work with a Japanese firm in this venture and are looking at Egypt, Qatar and Turkey as countries in which to invest. It looks like Turkey is edging ahead of the competition and Dedeman can take full advantage of sectoral incentives related to energy, land and labor. This smelter project will add value to their ore production and will certainly increase the company's competitive advantage.

The second smelter is related to their zinc production. The smelter is a leach, SX-EW investment that will generate 20,000 tons of zinc metal, expandable to 50,000 tons.

And it is not only in Turkey that Dedeman has seized upon opportunities. With their experience and know-how, the firm has made moves outside of Turkey's borders, with the acquisition of a copper mine in Albania. The mine has proven reserves of 3 million tons. Yet for Dedeman, Turkey will always represent untapped potential. Confident that there will never be a shortage of licenses to be acquired, they believe that the country presents the investor and explorer with ample opportunities.

The story is the same throughout the country. Ekin Maden, Turkey's leading metal trading company is equally bullish. Trading copper, zinc, lead and aluminium, they control the market and are its market makers, especially when zinc is considered. Each year, they import around 100,000 tons of the metal, on top of 30,000 tons of copper and lead as well as 25,000 tons of aluminum. As middlemen, they trade

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Turkish zinc concentrate all over the world. "There should be no competition between companies because the mining potential of Turkey is large enough," said CEO, Cenk Yılmaz. "We are operating eight mines today. Our target is to exploit more of the potential here. In 2008, we will carry out feasibility studies and try to increase the potential of our current mines. We think the sector is valuable and will continue to be so well into the future. That is why we want to invest."

It is clear to see why the industry has developed so quickly over the last few years or so. What remains a mystery and what is remarkable is why it took the nation so long to develop a modern infrastructure to exploit its potential. Mehmet Üzer, general director of MTA, points out that "Turkey is 100 years late."

However, thanks to its varied and large reserves, it is catching up fast.

From Public Behemoths to Private Giants

The modern Turkish mining industry was born with the creation of state



Tüprağ-Eldorado Gold - Blasting process at the Kışladağ Gold mine.

giants Eti Bank and MTA in 1935. With government control over much of the exploration, mining and processing of Turkey's mineral and metal resources, the state was able to ensure a fast and reliable supply of resources to assist

the rapid growth of Turkey's economy. And it was thanks entirely to government control that such enterprises were able to grow into what can only be described as "public behemoths."

Today, Eti Bank no longer exists in its original form. It was broken up over the years into separate entities, including Turkey's largest mining firm, Turkish Coal Enterprises (TKI), as well as Eti Aluminum and Eti Copper. It now exists under the name Eti Mine.

Despite being government owned, many of the public firms act almost as if they were private, profit making entities whose purpose is to help drive the Turkish mining industry forward and act as figureheads alongside the many private companies, many of whom were created thanks to the process of privatization, initiated by the government in the 1980s as means of developing the sector. "There is a tendency to have coal in government hands, as it is tied to energy consumption," said TKI's President, Dr. Selahaddin Anaç. "The same can be said of boron. All of the other minerals are 100% open to private and foreign enterprise. Due to the 1973 oil crisis, oil consumption was hard to cover so the government nationalized all of the basins where you could build power plants. The only resource you can't play with is coal. You can increase the capacity and as such, the government would like to control all electric and coal activities."

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Two interesting examples of this are the aforementioned TKI and MTA. Established in 1987, as an offshoot of Eti Bank, TKI is wholly occupied with the lignite business, of which it is Europe's third largest producer, holding 2.5 billion tons of reserves and annual production of 35 million tons. As Turkey's largest mining entity and considered a profit-making enterprise, today it generates \$1 billion in revenue and employs 12,000 people. Anaç's overarching goal is to "generate intellectual input into mines" and in this vain he has pursued an aggressive restructuring policy to ensure that TKI remains at the forefront of the Turkish mining industry and is seen as to be leading by example.

In restructuring the organization, Anaç has divested TKI's interest in nine of its mines—these have been privatized and leased and in the process, has created many smaller coal companies. "We are trying to re-adjust ourselves with the changing global atmosphere. We are, for example, trying to carry out contract mining where we are involved in a project for five to 10 years. We are creating expertise in certain areas of mining," said Anaç. This is most notable when observing TKI's research and development activities. Working closely with research centers and universities, TKI is helping to develop the intellectual capabilities of Turkey and is trying to create an intellectual platform. Anaç would like to raise the bar when it comes to R&D and efficiency and develop an intellectual environment comparable to those found in Europe. He has recognized that the way forward is in R&D, in developing new techniques and processes.

TKI is working closely with MTA to promote exploration activities and is attempting to develop inter-governmental relations, including an agreement signed with the U.S. Department of Energy.

So, rather than merely acting to preserve its own future, TKI is acting in the best interest of the Turkish mining industry as a whole. It is creating and developing an intellectual knowledge bank and then disseminating this throughout the industry to create a strong intellectual platform which will steer the industry in the right direction.

MTA has had an equally significant impact on the industry. Tasked to explore unknown minerals, MTA has taken a central place in finding all of Turkey's minerals and exploring them and the organization has spent a considerable number of years creating a geological map of Turkey, which will be completed in 2008 and will serve to educate both those already working in the industry, as well as future geologists and mining engineers.

Moving forward, MTA is looking to increase its drilling activities, particularly in the field of metal mining. "We are seriously working on mapping, drilling and adding value to metallic minerals," said General Director, Mehmet Üzer.

The public giants, thanks in part to the innovation present within their organisations and the forward thinking nature of their structures, are helping the mining industry to grow and are demonstrating to the outside world that Turkey is home to long-standing institutions who are at the top of their game.

Certainly, it was upon the foundations of such public bodies that the modern mining industry was built. It was, however, economic reforms implemented in the 1980s that led to the accelerated development of the sector.

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Privatization and the Mining Industry

Throughout most of the history of the Turkish republic, the government adopted a quasi-statist approach to economics, heavily regulating private participation in industry, foreign trade and foreign direct investment. A series of striking shifts in the 1980s by Prime Minister Turgut Özal changed all this. His reforms were intended to transform Turkey from its inward focused import substitution economic model to an export led growth and industrial one—a liberalized economy based on a private sector, market based model. These changes are laid out in Privatization Law No. 4046 of 1994. His aim was to ensure the future success and continued growth of the economy and Turkey's industrial sectors by encouraging competition through private ownership of once owned state assets.

Privatization led to a flurry of activity across all industries and consequently the intended rapid economic growth and substantially increased foreign direct investment. The mining sector was no exception.

Indeed, the industry has experienced a couple of decades of unparalleled growth partly due to the explosion of private owned firms, but most notably thanks to the inclusion of foreign mining companies, attracted by the new and investor friendly business environment. The reforms created a

vibrant and dynamic environment. "During state owned times, Turkey did not do much exploration and the mining industry was unknown. When experienced foreign mining firms came in and picked deposits, then mining took off," said Karahan. What is clear is that since privatization, the industry has taken significant steps to update its business practices and bring them in line with international standards.

It has, however, not been easy to arrive at where the industry stands today. Many of the now privatized mining companies inherited cumbersome and bureaucracy laden public sector structures where inefficiencies had hampered growth. "Since the privatization of the industry, many companies have restructured and improved their business structures, have invested in diversifying their product range and have begun to prospect and explore. This is a sign that the industry is heading in the right direction and one day could compete against the likes of South Africa," said Karahan.

One such company is Eti Copper. Privatized in 2004, the Cengiz Group took over what they describe as a firm "conditioned by the existing running efficiencies of the past ownership of the company by the public sector," said Business Development Manager, Zeynep Cengiz. "The company was over-staffed and the bureaucracy was complicated."

They plan to become more efficient through re-structuring. To "expand and increase [their] profits," they plan to invest in the renewal of their facilities and have just completed a comprehensive renewal of the smelter in the Black Sea town of Samsun. "When we started the business we produced 30,000 tons of blister copper per year. Right now we are up to 40,000 tons and we are aiming to expand this figure," said Cengiz. In looking to grow their business, the Cengiz Group is seeking opportunities outside of Turkey, expecting to close deals with global traders to achieve foreign market penetration.

They faced similar problems when they took over Eti Aluminum in 2005. Until the purchase, no modernization efforts had been made at the company plant since 1972. In 2005, the staff numbered 2,500. That figure now stands at 1,400. "We have increased the efficiency of the plant. In the past it had a capacity of 340,000 tons of aluminum hydroxide, but of that figure, 200,000 tons was for its own consumption. Sales Engineer Emre Kayışoğlu said, We are now working at full capacity and through small engineering investments, we are going to increase our production by 20%, to 400,000 tons."

They are certainly not shy when it comes to investments. "Within two years we have invested \$150 million in renewing, among others, the casting facility. We have plans to invest a further \$200 million in a hot-rolling mill, which will be the only one in Turkey," said Kayışoğlu. Such significant investments are testament to the fact that the Cengiz Group wishes to make mining its core activity.

The experience of the Cengiz Group is not unique and is mirrored by that of the Yıldırım Group. With a turnover last year of \$800, the Yıldırım Group has interests in coal and energy, port management (they are currently building Turkey's largest container port, shipping and fertilizers. In September 2004, they further diversified their interests by acquiring Eti Chrome from government hands. President and CEO, Robert Yuksel Yıldırım, explains the state of affairs when his family company took over. "When we bought Eti Chrome from the government, all of the furnaces were shut down and the mines had mostly stopped production. The government took all of the workers and gave us only the physical assets."

The Yıldırım Group set about restructuring the entire company. They renewed the high carbon ferro-chrome furnaces and ordered two new standard ones. They also put together a chrome ore concentration plant. "We are trying to increase our production of chrome ore to become the market-maker," said Yıldırım. The Group aims to double its production of chrome ore and is already Turkey's largest producer with a 55% market share and has a turnover of \$150 to \$200 million, making Eti Chome the largest profit making entity within the Group. Whereas the government managed to mine 400,000 tons of ore, within three years, the Yıldırım Group has managed to raise this to 700,000 tons. And it doesn't stop there. Within five years, production is expected to be hiked to 1.5 million tons. This will be achieved thanks to planned investments of \$200 million in their chrome ore and high carbon ferro-chrome production.

The Yıldırım Group has worked hard to turn Eti Chome's fortunes around with the ultimate aim of one day making the firm the world's premier chrome ore trader. They have made Eti Chrome more customer orientated by tailoring their production and being flexible. They have restored confidence in what was once a tarnished name and Eti Chrome is now the "shining star of chrome mining," according to Yıldırım.

It is clear from such examples that the Turkish mining industry is full of highly talented and ambitious individuals who have recognized the potential that the industry presents and are doing all that they can to ensure its growth.

Yet, it was not only in the business sphere that many operators faced problems. Overcoming the public's attitude towards mining and privatization was another. Burdened with negative public perception, the private sector had an uphill struggle ahead of itself to convince local communities of the value of mining. Such problems continue to dog the industry. "Mining as an industry is not very well known. At the moment just hearsay and small articles inform the public. There is a strong 'not in my backyard' syndrome. To fight against that it is imperative to operate the mines in a responsible fashion. Only once this has been achieved can trust be built. Social and environmental impacts are very important," said Bora Arpacioğlu, senior environmental manager at SRK Consulting, a South African mining consultancy with offices around the world and whose presence in Turkey was established in 2001. According to Arpacioğlu, there is a gap between technical studies and public understanding. To solve this problem, mining firms have created lobby groups and hired consultants to win over and convince local populations. Such activity is well established in the regions, but these sort of initiatives need to be established nationwide.

Tayfun H. Cerrah, general manager of Teck Cominco, the Canadian mining giant, agrees. "We are facing some difficulties and challenges in dealing with increasing environmental concerns in the industry. At Teck Cominco, the pursuit of sustainability is central to the core values that drive our approach to business. Our success depends on our ability to help establish healthy communities and safe environments for our workers in jurisdictions where good systems of governance and social infrastructure exist or can be built as a result of our presence. Over our long history, we have learned that our relationship with people, communities and society is one of mutual support or interdependence. Indeed, our suc-



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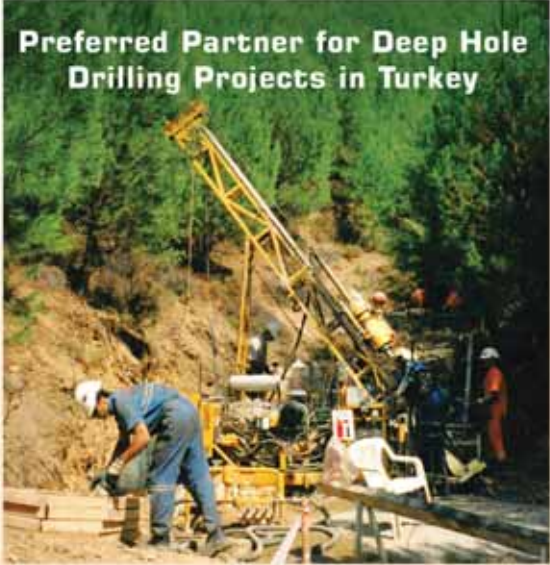


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cess is clearly tied to the contributions we make to achieve sustainability, wherever we operate.”

With the mining industry developing at a phenomenal rate, public perception has had a hard time keeping up. Those involved in the sector vehemently describe their efforts at educating the public as emphatic. These companies have to educate and train the local communities. They have to take them seriously because if they do not, they run the risk of a failed project.

Environmental awareness and the observance of relevant legislation is a sign of a wider adoption of international mining regulations and a stringent legal framework. As Karahan is quick to point out, “I have dealt with mining laws and regulations for over 20 years and every government has been good at promoting mining and at promoting a better investment environment for either local or foreign firms. Turkey is now one of the most liberal countries when it comes to mining law. Everyone can incorporate a company and can acquire properties and begin exploration. You can come to Turkey, apply for a license, fulfill your requirements with regards to environmental law and start investing. All the rules and regulations are there.”

Turkey’s mining regime, once governed by the mining law No. 3213 of 1985, was modified in June 2004 with a new mining code, Law No. 5177. The purpose of this new law was to provide investors with a more friendly business environment. This amendment has been welcomed by the mining community. Red tape has lessened, particularly when it comes to licensing. Whereas before it could take months for foreign firms to prepare the necessary documents to set up a local subsidiary, it now takes a mere two weeks. And with corporate tax reduced from 30% to 20%, there is incentive enough to become a mining entrepreneur.

Dr. Mesut Soylu, general manager of Eurasia Minerals in Turkey, is effusive when it comes to the new mining code. “There is a great mining law in Turkey, where it is now very easy to make an application for exploring. Within ten days to two weeks you can have acquired a license to mine for five years. A 200,000 hectare license costs only \$1,200 and the annual fee is a paltry \$250.”

Perhaps the motivation for this



Liquid gold from Koza Gold’s Ovacik mine.

change in the mining law is Turkey’s desire for EU membership. Some of the legislation is even more stringent than European ones, notably parts of the nation’s environmental legislation.

The government has taken all of the necessary steps to push Turkish mining law into the 21st century by creating a legal framework of international standard. There are certainly some issues, notably regarding the way licenses are issued and managed, but these are small niggles which are perhaps commonplace in a legislative environment which is dealing with a new industry and new infrastructure. Given time, they will be ironed out. Mining legislation has improved leaps and bounds over the last few years and those in Turkey’s legislature will continue to learn and adapt and modify the laws accordingly.

International Players in the Local Market

With a strong and fast growing economy, a stable currency and a dynamic and modern mining industry, with opportunity aplenty for the mining investor, it comes as no surprise to learn that foreign firms have been playing an increasingly active role of late in exploring and exploiting Turkey’s reserves. Most notably their activities are centered on base metals with the likes of Teck Cominco, Eurasia Minerals, Aldridge Minerals and Ariana Resources all present to varying degrees. “There are for-

eign mining firms and small prospecting companies who are coming to Turkey. One thing for sure is that the industry is growing,” said Ali Safder İplikçioğlu, vice president of Meta Nickel, a firm established in 2002 and Turkey’s first exporter of nickel ore.

Eurasia Minerals, for example, is the fourth largest landholder. According to Karahan, “The fact that foreign firms are in Turkey is testament to the vibrancy of the market.” Dr Y. Suha Nizamoğlu, general manager of Dedeman Mining, explains that “the geographic position, legal arrangement, technology and manpower quality of Turkey are all highly attractive for the investor.”

For Inmet Mining, Turkey is their flagship country and the Canadian firm has invested \$250 million in the country since 1992. Inmet Mining, through their Turkish subsidiary, Çayeli Mining, is in Turkey for the long term and they have understood the potential that the market presents. “I certainly believe that Turkey does present great opportunity, said Sayılır. If you look at the past five to six years, the growth levels achieved demonstrate that Turkey is one of the region’s shining stars. It is now among one of the most promising countries amongst emerging markets. The business environment has never been so favorable. In mining the number of world-class companies coming to do business highlight Turkey’s prospects. These prospects are far greater than they have ever been.”

Sayılr's enthusiasm is echoed by several of his peers. Bora Arpacioğlu of SRK Consulting explains that "there is a lot of potential in Turkey, due to its natural resources and human resources." For Ariana Resources, a company founded in 2002 by British geologists, there is still much exploring to be done in Turkey making the country and extremely promising one indeed. "Turkey is the place to explore in Europe. It has some prospective geography, some of the most well-educated workforce and a very strong local mining sector that we can leverage off. It is a stimulating environment," said managing director, Kerim Sener.

Although gold is what is attracting most of the foreign players present in Turkey overseas mining companies are starting to have an interest in other types of resources. That is certainly the case for Toronto-based Silvermet, which has an earn-in agreement with Anatolia Minerals to acquire up to 70% of a zinc property in the area of Tufanbeyli. Through its Turkish subsidiary Çevmetco, Silvermet plans to set up a plant that will produce about 100,000 tons of zinc oxide concentrate at 65% zinc. Erden Yüksel, Çevmetco's general manager, gave more details about the current status of the project. "The feasibility studies to be finished in one or two months will determine the required level of investment, but the current estimates are \$100-120 million. If everything works according to our plans, production of zinc oxide will start in the second half of 2009."

Yüksel highlighted the infrastructure advantages from which Silvermet's Turkish project will benefit. Indeed, infrastructure is one of Turkey's strong points as compared to many other countries with mining potential: "The infrastructure has improved in such a way that you do not feel the difference between Turkey and any other European country. As an investment environment for mining companies, Turkey is one of the best in the world."


The fact that the quality of the local workforce is mentioned is interesting. While some say that there is a competent workforce present in Turkey, and there are those who categorically state that Turkey's number one asset is its people, there are many who argue that staffing remains a serious issue. "We have many good projects in our portfolio but finding the right quality of staff to work on them is becoming more difficult. The industry has suffered cyclical downturns in the past that resulted in many geologists leaving the industry. Experienced geologists who are willing to work in the field are not easily available," said Cerrah.

With so many foreign companies taking advantage of Turkey's resources an important question must be asked. What have these firms given to the local market in return? The answer to this is simple: examples to follow. Indeed, companies like the ones mentioned above have shown local firms how to do business. They have encouraged others to work to international standards and have set benchmarks for Turkish mining companies to work toward. In short, it is evident that the likes of Teck Cominco, Eurasia Minerals and Inmet Mining are helping the industry to develop faster than it would have without their presence. They are good for the sector and foreign and local firms have established an almost symbiotic relationship, the internationals using local firms for partnerships and market access and local players using their counterparts to gain experience and knowledge. "The future of the industry is in joint-ventures. We [Turkey] are in the process of restructuring our business culture," said

İplikçioğlu. Turkey's mining industry is indeed going through a revolution. More and more, local companies are beginning to work to international standards. Whereas before, they stood alone, Turkish firms have understood the importance of international partnerships and the lucrative benefits that can be reaped as a result. The injection of foreign capital and experience into a relatively young market is helping it to grow, mature and develop. Turkey's mining is being put on the international map.

A perfect example of how an international firm can "help" is Inmet Mining. "We are the school for new engineers and workers within the Turkish mining industry. In that sense, being one of the earlier and largest firms, we have been setting an example for the Turkish mining industry. We continue to provide a good example, for both new and established companies, in terms of environmental standards and employer recognition," said Sayılır. He further states that "all companies are taking our engineers. We have a big turnover as the new miners take our people. We want to train people and give them to the industry. This is a significant contribution." This augmentation and promotion of human capital and knowledge is a clear demonstration of the influence that major and experienced foreign firms can have on the local industry.

With so much having already been achieved by international players within Turkey and with so much of the country yet to be explored, the presence of foreign firms in Turkey can only grow. Turkey is a secret no more for the adventurous seeking a safe and prosperous country in which to do business.



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*“Coal is a wealth that will
revitalize Turkey as a whole.”*

H. Ataturk



Sitting on a Gold Mine

Turkey's potential for mining is not just about gold—but gold is the magnet for most overseas mining companies



Koza Gold - benefitting from record gold prices.

With prices of the precious metal at historical peaks, Turkey has become a destination of choice for gold mining companies, encouraged by the political stability and the favorable business climate brought in by the new Mining Law. It is estimated that 65% of the Turkish territory is suitable for exploration, in a country that is extremely hungry for gold. In 2007, the value of the 239 tons of imported gold bar amounted to \$5.8 billion.

Turkey counts two large gold mines in operation, Ovacık and Kışladağ, although the latter was closed by the courts last summer. Ovacık has been in Turkish hands since Koza Gold acquired Normandy's shares from Newmont in 2005. Annual production is around 5.5 tons of gold. "We have grown since 2005 to become a cash generating company with two mining operations, Ovacık and Havran, and one processing mill. Our aim is to keep growing and become the biggest gold producer in Turkey. Moreover, if we see opportunities abroad, in Asia or Africa, we will take them," said İsmet Sivrioğlu, Koza Gold general manager.

The other large-scale gold mine, Kışladağ, is run by Canadian Eldorado Gold through its Turkish subsidiary Tüprağ. When its environmental impact assessment (EIA) was challenged in the courts, a decision by the judges forced the company to shut the mine, which was closed in August 2007. At the time of writing, the mine has not been re-opened as the final decision on the case is still pending. The company expects the case to be resolved during the first half of the year and predicts that it will be able to put 190,000 oz of gold from Kışladağ onto the market in 2008.

The court decision on the Kışladağ case was a shock for the whole mining sector, especially considering the current government's willingness to support and promote mining activities in Turkey. Tüprağ-Eldorado received full backing from Ankara (through land nationalization and granting of licenses) to go ahead with another mine, the Efemçukuru project in Western Turkey, expected to produce 112,000 ounces per year once it starts operating. The problem

is that for this to happen, strong opposition from a section of the local community (which includes the mayor of İzmir) will need to be overcome.

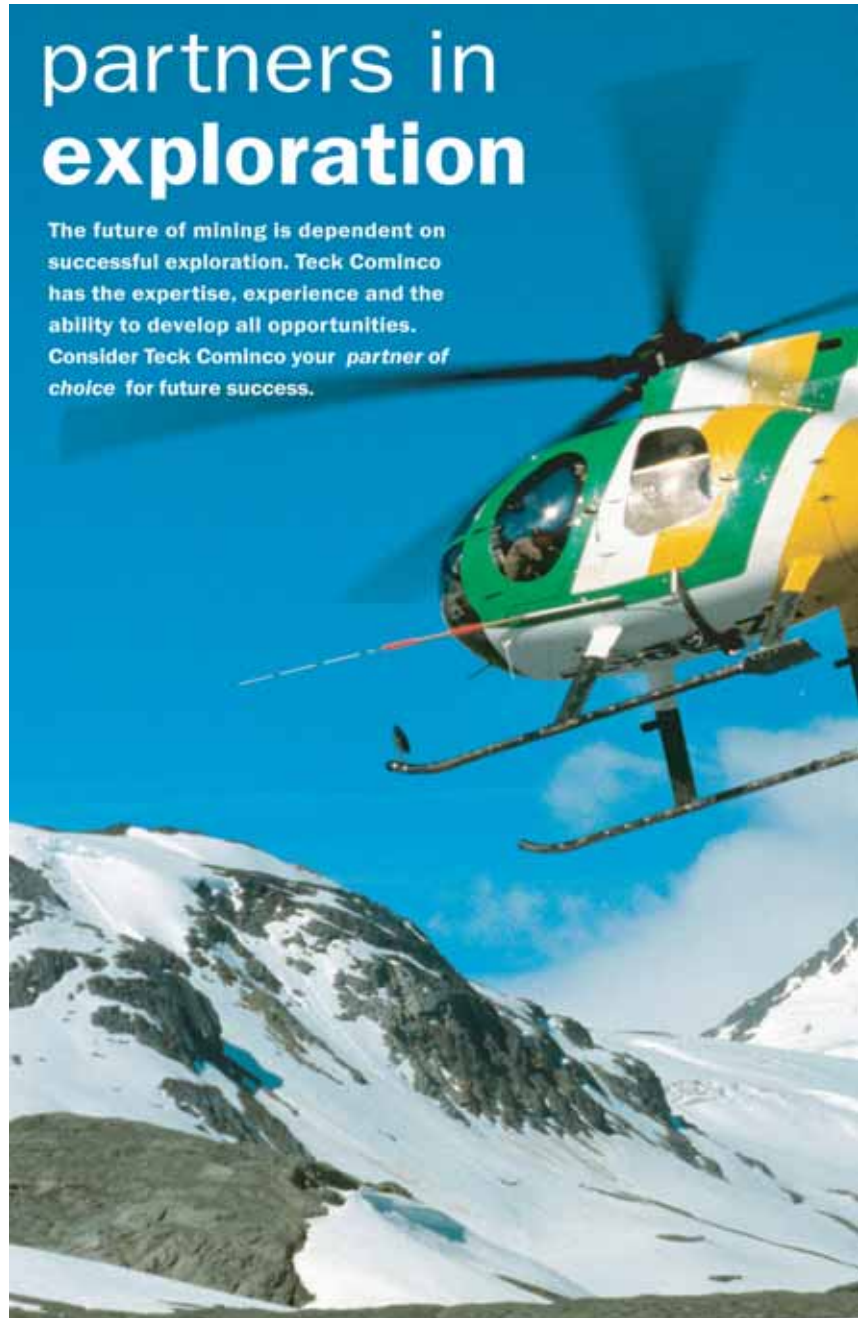
"We have always worked hard to get the support of the local people so we can integrate them into the project. In case there were problems we had to be the first to tell them. The fact that the government of Turkey has given you a license doesn't mean you don't need to speak to the locals. It is not a regulatory requirement, it is just good business practice," said Mehmet Yılmaz, director of Tüpraş. Yılmaz explains that Tüpraş has spent \$2 million in corporate social responsibility initiatives such as planting thousands of trees and providing local villages with water supplies. However, as he points out, "It takes a long time to demonstrate that mining brings quality to the lives of the local people." Local politics and a sometimes sensationalist media coverage do not make things any easier.

Those against gold mining are perhaps not very numerous, but they certainly know how to get their message across, giving the impression that the anti-mining feelings are high in Turkey, when the situation in the sites and surrounding villages is actually rather different. Some industry leaders complain that foreign companies are too easy a target for local NGOs and that generally Turkish companies do not need to invest as much money and time as they do in communication and social responsibility initiatives. More difficult to prove (and for many, even to believe) are the conspiracy theories according to which the businesses that benefit from the buoyant gold trade into Turkey are financing environmental NGO groups to prevent the local gold mining sector from developing.

To improve the image of the companies involved in gold exploration and development, the Turkish Gold Miners Association (AMD) was founded in 2006 including the main players, most of them foreign. Chairman of the Association, Ümit Akdur, from Tüpraş, believes the organization has been successful in communicating the problems of the sector to the related authorities and the local communities. However, he explains that it is very difficult to offset the effects of bad media coverage and gives the example of the sector's use of cyanide, one of the controversial issues pointed at by the environmental groups: "Turkey imports 300,000 tons of cyanide compounds. Only 3,000 of those are used in the mining industry, in two gold mines

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A reverse circulation drilling rig at Anatolia Minerals' Çöpler mine.

and a silver mine. However, everyone's attention is on these 3,000 tons, which makes 1% of the total, and no-one speaks about the rest."

The Importance of Reputation

It is clear that the challenge of winning over public opinion must not be ignored. That is why U.S.-based Anatolia Minerals, a company that is about to join the club of gold-producing players in Turkey with its Çöpler deposit, is being extremely careful in order to ensure that everything is right. Through its local operations subsidiary, Çukurdere, the company plans to invest between \$150 and \$170 million in the development of its flagship project, for which the EIA reports were submitted to the authorities at the end of January 2008. Adding reserves and resources, the potential for development reaches 6.3 million oz and the company expects this figure to increase in forthcoming updates.

"Since the problems affecting Eldorado/Tüprag, we have engaged in very close relations with environment agencies and the government to ensure the success of the submission," said Richard C. Moores, founder and former president and CEO. "The closure package is nearly detailed enough to be put out for bid. However success is not guaranteed and there are always changes. Government processes are beyond our control. We hope to initiate development earlier rather than later in 2008."

Besides the relevant authorities, Anatolia is also making sure that the neighboring communities are involved in the

decision-making processes. The company tries to educate the locals by providing comprehensive information and even going as far as flying villagers to America so they can see mines in operation. And like others in the sector, Anatolia has undertaken a number of social responsibility initiatives, which are becoming increasingly common in the Turkish mining sector. "Turkish corporate social responsibility is improving for a number of reasons. First, Turkey's attempts to join the EU have raised the bar. Secondly, Western companies are bringing their experience and higher standards into Turkey and working with the Turkish authorities. Moreover, the mindset has changed over the last years and now people have to win on all levels for a project to be successful. In our case, our standard has always been to do things right or not do them at all," said Moores.



Drilling samples being examined at the Çöpler mine.

Kışladağ, Ovacık, Çöpler... What's Next?

At different stages of the exploration process, there are several other projects that are likely to be pushed to development in the medium term. One of those is Yenipazar, run by Aldridge Minerals. A polymetallic deposit (copper-lead-zinc with gold content), the latest 43-101 report produced with data from January 2007 stated that the reserves are 3.58 million tons (indicated) plus 3.87 (inferred), although the company is convinced that the real reserves triple the current figures. "Aldridge's next independent report will give a figure of 20 million tons of ore, which brings us nearly to the level of Çöpler and Kışladağ. Once the preliminary economic assessment is complete we will become a major player," said Martin S. Ocşlon, director and exploration manager. The company has an agreement with Anatolia Minerals to earn 100% of the project and expects to start mining the deposit in two years time. In the meantime, it is also concentrating on nickel opportunities on Turkish territory.

Another company in charge of projects that are close to feasibility stages is Teck Cominco. The Canadian-based multinational was one of the first overseas companies to start operations in Turkey in the 1980s. The fact that 18% of Teck Cominco's global exploration budget is dedicated to Turkey shows the potential that the company sees in the country. "Our exploration budget for this year is of more than \$15 million if we include expenditures by our partners. It is significant money by Turkey's standards. Our plan is to drill approximately 20,000 m on the properties located in the west of the

country," said General Manager, Tayfun H. Cerrah.

Teck Cominco has a majority interest in three projects where it works jointly with Vancouver-based Fronteer. These are Agi Dagı (2.1 million oz), Kirazlı (1.4 million oz) and the copper-gold new discovery at Halilaga, that could be a "world-class deposit," in Cerrah's words, and that "has the potential to be a company maker," said Ender Özaydın, Fronteer's general manager in the country.

Working Through Partnerships

With exploration activities in Halilaga being stepped up in order to unleash the deposit's full potential, the collaboration between Teck Cominco and Fronteer is proving fruitful and showcases the joint venture possibilities available in the market. "Teck Cominco's success in Turkey has been the result of partnerships with good junior and major companies. We have been in Turkey for two decades and have tremendous experience and knowledge of Turkey's geology and a significant proprietary database. As the partner of choice we can bring quality staff, superior technology and excellent reputation to bear on all of our projects," said Cerrah.

Özaydın agrees that strategic alliances are a growth driver for mining companies. "Thanks to this partnership we have been able to combine financial resources, talent on the ground and relationships with key Turkish vendors and government agencies. Most importantly, we have shared knowledge. As a result, we have been able to fuel exploration momentum on this new mineral district at a pace that each partner would not be able to maintain alone."

In the context of strong foreign investment in gold exploration, North American companies are not the only ones trying to get a slice of the pie. Stratex, a company formed in London in 2005, has rapidly grown its gold resources and currently holds 841,000 oz in deposits; 373,000 of these are in Inlice (its first discovery in the area of the Konya volcanic belt) where the resource drilling is complete. Other important projects are Altıntepe (311,000 oz, near the Black Sea) where Stratex works jointly with Teck Cominco, and Karaağaç-Muratdağı (157,000 oz), a project for which the company is currently looking for a partner.

The company is also keen on making joint ventures for other exploration pro-



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More exploration projects require more rigs.

grams. “Stratex is a dynamic company, specialising in rapid and efficient exploration within highly prospective areas,” said Bahri Yıldız, general manager in Turkey. “While focusing on exploration success the company requires strategic partnerships to develop its projects through feasibility and into production. We typically favor foreign companies in this situation as they can generally bring greater exposure to the project, as well as stronger technical expertise and financing. However, there is a growing tier of well-founded Turkish mining companies with which Stratex would be comfortable establishing project-development programs.”

With the help of partners, Stratex has a target of 2 million oz of gold to be identified by the end of 2009 in Turkey, but does not rule out undertaking projects in other countries. “Stratex’s geological staff also have extensive international experience and may review exploration projects within favorable jurisdictions outside of Turkey, should opportunities arise,” said Yıldız.

Small Deposit, High Grade

At current gold prices, smaller projects can be profitable provided they are of a high grade and the potential development costs are low. That’s the case for the Sındırgı Project of UK-based Ariana Resources, a company listed on the Alternative Investment Market (AIM) in London and that operates in Turkey under its subsidiary Galata Madencilik.

The Sındırgı project, which Ariana bought from Newmont in 2005, currently stands at 135,000 oz of gold and gold equivalent of silver. The company expects

to increase that number through more drilling (a new program at Kızıltepe, the main prospect, was started in January), so the project will become commercially viable very soon. Its Managing Director, Kerim Sener, emphasizes that the company has only tested 15% of the veins in Kızıltepe. “We have some other prospects elsewhere in the Sındırgı leases, which we intend to fit into the pipeline for exploration and eventual development, using Kızıltepe as a base. We are not worried that it is at present a small deposit because it’s high grade (6 grams of gold per ton and a couple of grams of gold equivalent of silver per ton).”

The question in Sındırgı is how many more resources need to be identified for the project to be viable. “We know of an economic project with just 150,000 oz of gold in South America, and that was of a much lower grade ore than that at Kızıltepe. I think, therefore, that 150,000 oz is likely to be our sensible minimum mineable resource. We understand that the operating costs of such a project will be fairly low,” said Sener.

Room for More?

Apart from focusing on their star projects, the companies mentioned in this article are constantly looking for new properties with potential. Although the arrival of foreign players is relatively recent, the gold fever has already had a serious effect on the price, and even the availability, of properties. Mining players not only have to compete with their counterparts to grab a piece of land; they also need to face local land-owners that, aware of the current gold

prices, ask for sensational amounts of money to sell.

This problem is felt particularly by those who started their operations in the country more recently. Kefi Minerals, a company in which EMED Mining has a 34% stake and that is undertaking exploration in several properties in both West and northeastern Turkey, has the advantage of possessing an extensive geological database in a country where this information is not easily available. However, getting the land is proving a challenge. “The lack of ground is an issue because there are many speculators and explorers. Under the tender system the smallest tenement is 0.1 hectares while the maximum size is 2,000 hectares, in any conceivable shape. The boundaries can be everywhere so it is difficult to get a coherent land package to explore. If you identify a mineralized area there could be any number of people who have bits of ground in it. Getting a decent area to explore is difficult; isolated tenements are just not worth it,” said Malcolm Stallman, exploration manager.

Şebnem Önder, a specialist in Turkish mining regulations at Çakmak, a law firm affiliated to White & Case that assists foreign mining companies in establishing their subsidiaries in the country, further explains the possible problems derived from the current legislative framework. “The biggest difficulty with the new law is the issuing of multiple licenses for different categories in the same area. This is not a problem for small quarries, but if you are developing a gold mine you don’t want another license holder to come into your area. You need space not only for the mine but for the required treatment plants as well. The mining department is supposed to ensure that the operations won’t interfere with each other, but sometimes control is not very effective.”

For Sener (Ariana Resources), a solution to the problem of land speculation could be provided by a modification of the regulation. “If the mining law was to be changed, there should be an exploration expenditure commitment for the companies and individuals holding licenses. That would have a knock-on effect: only serious entities would actually hold ground and put the effort in to exploring effectively. Companies and individuals would no longer be able to play the real estate game.” A game that is keeping some companies out of the market. The Istanbul Gold Refinery, a Turkish company with a

gold mining operation in Central African Republic, is looking at new opportunities in Guinea, Mali and Mongolia. Turkey is a tough market. "Despite the favorable business environment, we don't operate in Turkey because there are virtually no gold fields without licenses. Our challenge in Africa is instability and very high taxes," said General Manager, Ömer Halaç.

Prospects are Bright

Is the future of gold mining threatened by the aforementioned problems? Not at all. Purchasing land might be an issue but there is a phenomenal potential for gold mining. Turkey is a big country where relatively little exploration has been carried out, and all the companies present share a belief in big discoveries in the years to come.


"The biggest deposits have only been discovered or realized in the last 10 years, which suggests that there are more out there. The mineral potential is very good and there will be, on average, a big discovery every three years. This potential combined with a very good business climate will lead to more work," said Martin S. Oczlon, Aldridge Minerals.

Ümit Akdur, chairman of the Gold Miners Association, agrees. "Turkey is virgin in terms of exploration and gold is here, what was lacking was the funds and expertise for exploration. Now, with the presence of foreign companies, we have both to complete the triangle: funds, expertise and gold."

Turkey is literally sitting on a gold mine, or to speak more accurately, on a number of them. With companies stepping up their exploration efforts thanks to increased budgets, the next few years promise to be full of good news.




M. Ümit Akdur, chairman of Turkish Gold Miners Association.





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Turkey's Coal Resources Remain Valuable

Interview with TKI General Director and Head of Board Dr. Selahaddin Anaç

TKI is one of Turkey's most important and valuable mining firms. Could you please give us some background information on the company?

Separated from Eti Bank, Turkish Coal Enterprises (TKI) was established in 1987. In 1993, the hard coal business was separated from the lignite works. After 1993, we became 100% lignite orientated.

Turkish reserves stand at around 9.4 billion tons of lignite, 2.5 billion tons of which belongs to TKI. The private sector holds around 2 billion tons. As such, there is an active private sector made up mainly of small underground mines.

TKI is at the center of all the activities. We are the largest mining firm, with \$1 billion of revenue and around 12,000 employees. We have eight large mining operations at which we are doing open-pit mining as well as underground activities and contract mining.

We have eight enterprises and each enterprise has its own management committee and is partly independent in terms of their working capital. We can intervene if need be.

About 80% of our capacity is tied to power plants. For the past few years, energy use has been biased toward natural gas. This has created a volatile situation and we sometimes only work at 40% of our capacity. It is picking up again. After all, coal is the cheapest way of producing electricity, after hydropower.

Today, we are producing around 35 million tons of coal a year. We could produce more if necessary.

What improvements have you made to its structure and internal processes to keep pace with the modernization of the industry?

We have closed down economically wasteful mining activities by either selling these or leasing them. Since 2000, we have closed down nine mines and we have privatized or leased these.

We are trying to re-adjust ourselves within the changing global atmosphere. We are, for example, trying to carry out



Dr. Selahaddin Anaç, general director and head of board, Turkish Coal Enterprises.

contract mining where we are involved in a project for five to 10 years.

Does TKI export much of its production?

We are not exporting as our coal is not suitable for transportation and it does not have very high calorific values. The best quality we can produce is 5,500 kilocalories per kg and it is thus suitable for internal use alone.

With the government encouraging the privatization of the mining industry by auctioning off many of its enterprises, why is it that TKI remains a public company?

There is a tendency to have coal in government hands, as it is tied to energy consumption. The same can be said of boron. All the other minerals are 100% open to private or foreign enterprise. Due to the 1973 crisis, oil consumption was hard to cover so the government nationalized all of the basins where you could build power plants.

What do you hope to achieve by working closely with the private sector?

We promote cooperation with small contractor mining firms. We have created

small tenders for the purpose of converting them into proper companies. We buy their products and they have to meet certain standards, environmental standards for example. We are also assisting in training and this is within our remit—to help small private companies.

With 40% of the country yet to be explored for metals and minerals, what is TKI doing to change this?

We are going to promote exploration activities with General Directorate of Mineral Research and Exploration (MTA) in 2008. We devised a 10-year exploration plan in 2006 to encourage drilling for coal. Perhaps foreign companies may come in to explore.

What is your vision for TKI and what do you hope to achieve as its chairman?

One day we can increase our levels of efficiency and research capabilities to the levels that you see in Europe.

We would also like to do coal-to-liquid and coal-to-gas research. The way forward is in R&D and to develop new techniques and new processes.

Coal, as a raw material, is very important. It will continue to hold an important place in energy consumption and it will follow the development of the hydrogen industry. Perhaps coal could be a cheap source of hydrogen.

We might work closely with Europe and the United States. They are very interested in clean fuel so we could maybe get involved in carbon capture activities in our pilot plants.

We are promoting underground mining. We have created five large companies and we are purchasing 100% of their production. Also, since 2002, we have built 15 washeries.

TKI is restructuring. Each time we develop, we promote our activities. We are now the third largest lignite producer in Europe. Other countries have been impressed by our activities and have approached us to possibly work together in the future.



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Geologists and Rigs Wanted



Geologist teams have been working on detailed geologic mapping, geochemical surveys and geophysics in Cevizlidere - a copper porphyry province.

The arrival of foreign mining companies, attracted by gold and other metal prospects, a competitive infrastructure and a new favorable business climate, has started a boom in Turkish exploration activity, putting pressure on demand for basic resources such as drilling rigs and qualified exploration staff.

Turkey is a country with great geological prospects whose mineral resources were until recently waiting to be discovered. But new mining regulations introduced by a government keen to promote foreign investment and sky high metal prices have encouraged interest and investment from global miners.

The problem for a sector so dependent on the price of commodities is that periodic fluctuations have a long-term impact on the pool of both human and technical resources. The deterioration of metal prices just a decade ago provoked a slowdown in mining activities. Now back to "happy days," the industry needs to find new geologists and operators as well as equipment in order to make the most of the current opportunities.

Queuing for Rigs

The increasing number of exploration activities throughout Turkey is providing unprecedented levels of business for local drilling contractors. Business is so good that, at times, demand for rigs has outstripped supply capabilities. The main con-

tractors have invested heavily to expand their fleets but that has not deterred international mining players, like London-based Ariana Resources, from acquiring their own equipment. The company wants to stop being dependent on third parties for its drilling activities. "Once you reach a certain stage of exploration, you need to guarantee good core recovery. Core recovery from our contractor has been good, but we believe that with our own drilling team, specially trained for our own projects, we can do even better. The difficulty with contract rigs is that you can't get the rig when you want, due to the enormous demand," said Managing Director, Kerim Sener.

"Summing up all the costs involved, the investment in our own drilling team will pay back in just one year. Apart from the cost saving, with our own rig, we will be able to drill quickly and efficiently."

How is the shortage of rigs affecting the Turkish mining sector? Orta Doğu, the second largest drilling contractor for mining activities in Turkey, has just doubled its fleet from 10 to 20 rigs (18 diamond core rigs and two reverse circulation rigs). However, the company admits that they are nearly fully booked for 2008. "Our big competitor used to be the MTA (The Turkish government's General Directorate of Mineral Research and Exploration). Five to 10 years ago they were doing jobs for the private sector, but now they are giving

way to private contractors," said General Manager, Ahmet Zeki Topdemir.

This transfer of drilling activities to the private sector, together with the arrival of a myriad of foreign companies, has dramatically changed the scenario. "There are big drilling contracts to be signed, and not enough rigs. This is the reason for certain mining companies having their own machines," Topdemir said. "However, this problem cannot be solved by just acquiring new rigs because they are of no use if you don't have the right staff to operate them. It is difficult to find experienced drillers in Turkey." That is why after doubling its fleet, the company will study how the business develops over the next months before adding more rigs.

Despite the challenge of finding qualified and trained operators, some companies do manage to grow aggressively. Spektra Jeotek, the largest Turkish player in this field, started 2008 with a fleet of 34 rigs and plans to expand that figure to 50 rigs by the end of the year. Although the company serves customers both in Turkey and overseas (it is working with BHP Billiton in Equatorial Guinea, for instance), the demand from the local market is keeping most of the rigs on Turkish soil. "In 2006, Turkey only accounted for 50% of our operations, but that increased in 2007 to 70%, and in 2008, we expect Turkey to continue being the main growth driver," A. Levent Okay, general manager, said.

With regards to the labor shortages, "It is certainly difficult to find the right staff to operate each rig," said Okay. "However we are well positioned to overcome this problem because we have a very good training regime. Although these expenditures add to our costs, the investment pays off in the long term. 30% of our total crew is still under training. We expect the market to continue booming for the next three to five years so we need to be prepared."

Spektra also exploits the advantage of integration, as it owns a subsidiary company, Delta, dedicated to the manufacture of rigs. Until now supplying only the internal needs of Spektra, Delta is now being restructured to increase its production and to sell rigs to other players around the world from the second half of 2008, with an anticipated output capacity of five rigs per month.

With the current demand, how is it possible that large-scale foreign drilling contractors are not entering the Turkish market? Local companies give a simple answer: with the current metal prices, they have more than enough holes to drill in other countries. It is of no surprise, then, that new small Turkish players make their appearance in the very attractive Turkish exploration sector.

One of these new start-ups is Pozitif Drilling. The company's first rig was operational in June 2007 and it had its first contract later in the year, with Kefi Minerals. The company benefited from its drilling operators' background with other companies to attract customers: "We started with four drillers each with more than seven years experience in diamond drilling," Ecevit Iskender, general manager said. With a strong focus on HSE training in order to satisfy the requirements from foreign mining companies, Pozitif is adding a second rig to respond to the rising demand. "Our plans are to grow at a sustainable rate, making sure that expansion plans do not affect the quality of our work and staff."

The Search for the Right Skills

Staffing is a key issue that constrains virtually all the companies present in the country. Even if Turkey is an attractive place to live and work for many reasons, the number of qualified mining expats is limited due to the high demand for these skills elsewhere around the world. Locally, despite the potential of a very young population, graduates are not sufficient to fulfil the sector's requirements, especially because a fair amount of post-university training in the field is proving necessary.


"A shortage of good geological staff is our main challenge," said Malcolm Stallman, exploration manager of Kefi Minerals. "The training at university in Turkey is theoretical rather than practical. When students leave university they may only have seen one mine, so they need hands-on training. And because there are so many companies looking for people we feel pressure on costs."

Bora Arpacioğlu, senior environmental engineer of SRK Consulting in Ankara, agrees that Turkish graduates should have more practical training at the university. "There is a flow of new graduates with good education but their experience needs to be augmented: they need exposure to large-scale international projects. Our advantage as an international company is that we work closely with other SRK offices to do staff exchanges."

The problem is that not all companies can leverage on their multinational presence to train their staff. Ideally, graduates should acquire greater levels of practical experience, but for that much deeper collaboration between companies and universities should be established. "Students should have an interest on both the academic and the commercial side of mining," said Dr. Ali Kahrman, head of the Mining Engineering Department at Istanbul University. "That would help them know the real problems that the industry is facing and therefore they would be better prepared to work in a company at the time of leaving university."

Events such as the symposium on zinc and copper that Istanbul University hosted in January 2008, attended by the main mining companies operating in Turkey, are perhaps a good sign of the willingness of both sides to tie stronger bonds. However, good intentions need to translate into specific programs for the industry to find more and better qualified geologists. Turkey has enormous potential as a mining country, but the speed of the sector's development will be determined by the availability of people to support it.

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