DOKUZ EYLÜL UNIVERSITY
GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES

PLACE OF MINING ENGINEERING IN EU PROCESS

by
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January, 2007
İZMİR

PLACE OF MINING ENGINEERING IN EU PROCESS

A Thesis Submitted to the
Graduate School of Natural and Applied Sciences of Dokuz Eylül University
In Partial Fulfillment of the Requirements for the Degree of Master of Science
in Mining Engineering, Mineral Processing Program

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Ali Serhat YAVUZ

January, 2007
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M.Sc THESIS EXAMINATION RESULT FORM

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ACKNOWLEDGMENTS

I would like to thank to Assoc. Prof. Dr. Turan BATAR for his endless support and helpful comments.

I also need to thank to my family and to my friend M. Kemal Ozfirat for their continuous support.

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PLACE OF MINING ENGINEERING IN EU PROCESS

ABSTRACT

Turkey is at a very exciting time in its history. Never before has Turkey had such potential to become a major centre for business and commerce. As this modern, democratic, secular state looks to join the European Union (EU), it continues to institute a massive program of political, economic, social and judicial reforms to align itself with European laws and practices.

Turkey's recent macroeconomic performance of high growth and low inflation, coupled with a $12 billion IMF standby agreement starting in 2005, has enhanced market stability. With a population of over 70 million and the world's 17th-largest economy, Turkey is expected to outpace the average growth of countries in the E.U. over the next few years. This growth represents tremendous commercial potential for the EU countries.

Turkey has significant geological potential and is very much underexplored. The country's new mining law, which provides incentives for investment in mine operations, exploration and development, is expected to encourage foreign investment in this sector. Major opportunities exist in upgrading facilities for mining boron, coal, zinc, copper, gold and silver, as well as iron ore, bauxite and lead. Other opportunities include engineering services and equipment supply.

Keywords: EU, Turkey, Mining, Mining Industry.

AVRUPA BİRLİĞİ SÜRECİNDE MADEN MÜHENDİSLİĞİ'NİN YERİ

ÖZ

Türkiye tarihinde çok heyecanlı bir zaman noktasındadır. Türkiye daha önce hiç bu kadar büyük bir iş ve ticaret merkezi olma potansiyeline sahip olmamıştır. Demokratik ve modern ülkemiz Avrupa Birliğine (AB) girmeye hazırlanırken, AB yasalarına ve uygulamalarına uyum sağlamak için politik, ekonomik ve sosyal reformların yer aldığı bir program uygulamaya devam etmektedir.

Türkiye'nin son yıllardaki makroekonomik performansı, hızlı gelişmesi ve düşük enflasyonu, 2005'de başlayan IMF'nin 12 milyar dolarlık antlaşmasıyla birlikte piyasa dengesini sağladı. Önümüzdeki birkaç senede, Türkiye'nin 70 milyonluk nüfusu ve dünyanın en büyük 17. ekonomisine sahip olmasıyla AB ülkelerinin ortalama büyümesini geçmesi beklenmektedir. Bu durum AB ülkelerine müthiş bir ticaret potansiyeli sağlayabilir.

Türkiye oldukça büyük ve keşfedilmemiş bir jeolojik potansiyele sahiptir. Ülkenin yeni madencilik kanunu, madencilik opersyonlarına, keşfe ve gelişime olanak sağlamakta ve dolayısıyla bu sektöre olan yabancı yatırımları artırması beklenmektedir. Bor, kömür, çinko, bakır, altın ve gümüş madenlerinin yanısıra demir cevheri, boksit ve kurşun madenlerinin faaliyetlerini iyileştirmek için birçok fırsat sağlanmaktadır. Diğer fırsatlar mühendislik hizmetleri ve ekipman arzını kapsamaktadır.

Anahtar Sözcükler : AB, Türkiye, Madencilik, Madencilik Sektörü.

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CHAPTER ONE

INTRODUCTION

1.1 European Union History

The European Union (EU) is an intergovernmental and supranational union of 27 democratic member states. The European Union is the world's largest confederation of independent states, established under that name in 1992 by the Treaty on European Union (the Maastricht Treaty). However, many aspects of the Union existed before that date through a series of predecessor relationships, dating back to 1951.

The Union currently has a common single market consisting of a customs union, a single currency managed by the European Central Bank (so far adopted by 12 of the 27 member states), a Common Agricultural Policy, a common trade policy, and a Common Fisheries Policy. A Common Foreign and Security Policy were also established as the second of the three pillars of the European Union. The Schengen Agreement abolished passport control, and customs checks were also abolished at many of the EU's internal borders, creating a single space of mobility for EU citizens to live, travel, work and invest.

The most important EU institutions include the Council of the European Union, the European Commission, and the European Court of Justice, the European Parliament, the European Council, and the European Central Bank. The European Parliament's origins go back to the 1950s and the founding treaties, and since 1979 its members have been elected by the people they represent. Every five years elections are held in which registered EU citizens may vote.

The European Union's activities cover most areas of public policy, from economic policy to foreign affairs, defense, agriculture and trade. However, the extent of its powers differs greatly among areas. In some the EU may resemble a federation (e.g. on monetary affairs, agricultural, trade and environmental policy, economic and social policy), in others a confederation (e.g. on home affairs), and in yet others an international organization (e.g. in foreign affairs).

1.2 Current Situation

Issues currently facing the EU cover its membership, structure, procedures and policies. They include the status and future of the constitutional treaty; enlargement to the south and east; problems of financial probity and democratic accountability; relative economic viability; revision of the rules of the Stability and Growth Pact; and the future budget and the Common Agricultural Policy.

At the December 2005 European Council, which is a semi-annual meeting of the heads of state and government of the EU member states, a decision was taken on how it should allocate the EU budget for the next seven years (2007–2013). Also, the "Financial Perspective" was defined as EU members agreed to fix the common budget to 1.045% of the European GDP.

UK Prime Minister Tony Blair agreed to review the British rebate, negotiated by Margaret Thatcher in 1984, despite a promise to the contrary made to the UK Parliament.

French President Jacques Chirac declared that this increase in budget will permit Europe to "finance common policies" such as the Common Agricultural Policy or the Research and Technological Development Policy. However, France's demand to lower the VAT in catering was refused.

Issues controversial during budget debates include the British rebate, France's benefits from the Common Agricultural Policy, Germany and the Netherlands' large contributions to the EU budget, and reform of the European Regional Development Funds.

Many commentators believe that these debates represent a major split between governments such as France and Germany, who call for a broader budget and a more federal union, and governments such as that of the UK, who demanded a slimmer budget with more funding transferred to science and research (and whose watchword is modernization).

The Treaty establishing a Constitution for Europe (TCE), commonly referred to as the European Constitution, is an international treaty intended to create a constitution for the European Union.

The failure of the constitution to win popular support in some member states (France and Netherlands) caused other countries to postpone or halt their ratification procedures, and the Constitution now has an uncertain future. Had it been ratified, the treaty would have entered into force on November 1, 2006.

However, as of May 2006, Austria, Belgium, Cyprus, Estonia, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, Slovakia, Slovenia and Spain had ratified the constitutional treaty.

The two countries have joined the European Union in 2007, Bulgaria and Romania; have already accepted the constitutional treaty too, ratifying their accession treaty.

1.3 Member States and Enlargement

The European Union's 27 member states cover an area of 4,242,070 square kilometers and have approximately 470 million inhabitants as of January 2007.

The European Union's member states combined represent the world's largest economy by GDP, the seventh largest territory in the world by area and the third largest by population. The EU describes itself as an "a family of democratic European countries", though it doesn't explicitly define "Europe" and "European ness".

On 23 July 1952 six founding members formed the European Coal and Steel Community (ECSC), which was transformed into the European Community, later renamed to European Union in waves of accession as follows:

Table1.1 History of Country's Membership

Date	History of Country's Membership
25 March 1957	Belgium, France, West Germany, Italy, Luxembourg, Netherlands, founding members
1 January 1973	Denmark, Ireland, United Kingdom
1 January 1981	Greece
1 January 1986	Portugal, Spain
3 October 1990	(The territory of the former German Democratic Republic as part of unified Germany also becomes part of the European Community)
1 January 1995	Austria, Finland, Sweden
1 May 2004	Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia
1 Jan 2007	Romania, Bulgaria

Note: European jurisdiction is not currently enforced in Northern Cyprus

1.4 Future Enlargement

Croatia is an official candidate country to join and started accession negotiations in October 2005. In June 2006, the EU officials projected that the accession of Croatia would likely happen in 2010. The closure of negotiations for all chapters of the acquis communautaire is expected in 2008 or 2009, while signing the Accession treaty would happen in the year after.

Turkey is an official candidate to join the European Union. Turkish European ambitions date back to 1963 Ankara Agreements. Turkey started preliminary negotiations on 3 October 2005. However, analysts believe 2015 is the earliest date the country can join the union because of the plethora of economic and social

reforms it has to complete, and because the 2007-2013 budget takes no account of the considerable costs Turkey's accession will involve. Part of the problem with Turkey's possible accession is the fact that 97% of its land mass lies on the Anatolian peninsula of western Asia (also known as Asia Minor) and a mere 3% lies within continental Europe. Turkish officials have countered this by stating that countries such as Ukraine and Belarus lie just as Far East, whilst Georgia, which is partially within Europe geographically, is situated even further east than Turkey and shares part of its northeastern border. Thus it can be claimed that Turkey shares a border with another European state to both the east and west.

The Former Yugoslav Republic of Macedonia has been given official candidate status as of December 2005.

Following the formal independence of Montenegro from Serbia in June 2006, its government has made accession to the EU within five years a priority policy.

The EFTA states of Norway, Iceland and Liechtenstein are members of the European Economic Area which allows them to participate in most aspects of the EU single market without formally acceding to the EU. Switzerland, the fourth EFTA state, rejected EEA membership in a referendum; however, it has established close ties to the EU by means of various bilateral treaties.

It is generally considered that following Romania and Bulgaria's accession in January 2007, the next group of states to attain full EU membership is likely to be Croatia, Macedonia and Montenegro (and perhaps Serbia) in 2010. It is deemed unlikely that any of the remaining East European states such as Albania, Moldova, Bosnia-Herzegovina, Belarus, Ukraine, Georgia and Turkey will accede to the EU before 2015 at the very earliest.

CHAPTER TWO

EUROPEAN UNION AND TURKEY

2.1 Relationship of the European Union to Turkey

The relationship of the European Union to Turkey is an issue of immense importance for the Union . The possible accession of Turkey to the EU will influence, not only the political set-up in the Union and Europe as a whole, but also the living conditions of the many EU citizens and people who live on the continent.

The EU and Turkey enjoy a deep trade relationship. Indeed, the EU ranks by far as number one in both Turkey's imports and exports while Turkey ranks 7th in the EU's top import and 6th in export markets.

Table 2.1 E.U. Trade with main Partners, 2005 (Eurostat, 2006)

	Partners	Mio euro	%
	World	1 176 055	100.0
1	USA	163 057	13.9
2	China	158 098	13.4
3	Russia	106 766	9.1
4	Japan	73 243	6.2
5	Norway	67 474	5.7
6	Switzerland	66 354	5.6
7	Turkey	33 492	2.8
8	Korea	33 326	2.8
9	Taiwan	23 835	2.0
10	Brazil	23 300	2.0
11	Saudi Arabia	22 092	1.9
12	Algeria	20 735	1.8
13	Libya	19 473	1.7
14	India	18 911	1.6
15	Singapore	18 219	1.5
16	Canada	17 174	1.5
17	South Africa	16 731	1.4
18	Malaysia	15 905	1.4
19	Romania	15 305	1.3
20	WA_AO	13 761	1.2

	Partners	Mio euro	%
	World	1 061 836	100.0
1	USA	251 657	23.7
2	Switzerland	81 980	7.7
3	Russia	56 445	5.3
4	China	51 796	4.9
5	Japan	43 663	4.1
6	Turkey	41 849	3.9
7	Norway	33 787	3.2
8	United Arab Emir.	25 288	2.4
9	Canada	23 681	2.2
10	Romania	21 825	2.1
11	India	21 110	2.0
12	Australia	20 710	2.0
13	Hong Kong	20 434	1.9
14	Korea	20 130	1.9
15	South Africa	18 077	1.7
16	Singapore	17 227	1.6
17	Mexico	16 762	1.6
18	Brazil	15 987	1.5
19	Saudi Arabia	15 443	1.5
20	WA_AO	13 484	1.3

	Partners	Mio euro	%
	World	2 237 891	100.0
1	USA	414 714	18.5
2	China	209 894	9.4
3	Russia	163 211	7.3
4	Switzerland	148 334	6.6
5	Japan	116 906	5.2
6	Norway	101 261	4.5
7	Turkey	75 341	3.4
8	Korea	53 456	2.4
9	Canada	40 855	1.8
10	India	40 021	1.8
11	Brazil	39 287	1.8
12	Saudi Arabia	37 535	1.7
13	Romania	37 130	1.7
14	Taiwan	36 653	1.6
15	Singapore	35 447	1.6
16	United Arab Emir.	35 087	1.6
17	South Africa	34 808	1.6
18	Algeria	31 150	1.4
19	Hong Kong	31 109	1.4
20	Australia	30 182	1.3

Main Turkish exports markets in 2003 were the EU (58.1%), USA (8.2%), Russia (2.3%), Israel (2.2%), Romania (1.5%) and Saudi Arabia (1.4%). Textiles dominate EU imports from Turkey, accounting for about 40% of the total. Other important imports are transport material (16.3%), agricultural products (8.9%) and office machinery and telecommunications equipment (5.8%).

Imports into Turkey came from the following key markets: the EU (52.4%), Russia (7.5%), USA (4.6%), Switzerland (3.9%), China (3.5%), Japan (2.4%) %). Main EU exports to Turkey are machinery (28.3%), chemical products (16.4%), and transport material (19.1%).

Table 2.2 Turkey's Trade Balance main Partners, 2005 (Eurostat, 2006)

	Partners	Mio euro	%
	World	92 371	100.0
1	EU	44 268	47.9
2	Russia	9 781	10.6
3	China	4 160	4.5
4	USA	3 852	4.2
5	Korea	2 576	2.8
6	Iran	2 249	2.4
7	Switzerland	2 244	2.4
8	Japan	2 059	2.2
9	Ukraine	2 047	2.2
10	Romania	1 693	1.8
11	Libya	1 587	1.7
12	Saudi Arabia	1 528	1.7
13	Algeria	1 341	1.5
14	India	1 001	1.1
15	South Africa	986	1.1
16	Bulgaria	948	1.0
17	Israel	666	0.7
18	Malaysia	623	0.7
19	Brazil	535	0.6
20	Indonesia	535	0.6

	Partners	Mio euro	%
	World	57 494	100.0
1	EU	30 825	53.6
2	USA	3 956	6.9
3	Iraq	2 001	3.5
4	Russia	1 480	2.6
5	Romania	1 230	2.1
6	United Arab Emir.	1 220	2.1
7	Israel	1 157	2.0
8	Bulgaria	836	1.5
9	Iran	836	1.5
10	Algeria	818	1.4
11	Saudi Arabia	777	1.4
12	Ukraine	497	0.9
13	Egypt	477	0.8
14	China	456	0.8
15	Syrian Arab Rep	389	0.7
16	Canada	386	0.7
17	Libya	367	0.6
18	Switzerland	366	0.6
19	Kazakhstan	341	0.6
20	Morocco	329	0.6

	Partners	Mio euro	%
	World	149 865	100.0
1	EU	75 093	50.1
2	Russia	11 262	7.5
3	USA	7 808	5.2
4	China	4 616	3.1
5	Iran	3 085	2.1
6	Romania	2 923	2.0
7	Korea	2 664	1.8
8	Switzerland	2 610	1.7
9	Ukraine	2 544	1.7
10	Iraq	2 379	1.6
11	Saudi Arabia	2 305	1.5
12	Japan	2 247	1.5
13	Algeria	2 160	1.4
14	Libya	1 954	1.3
15	Israel	1 823	1.2
16	Bulgaria	1 784	1.2
17	United Arab Emir.	1 420	0.9
18	South Africa	1 183	0.8
19	India	1 142	0.8
20	Kazakhstan	782	0.5

Table 2.3 Import from Turkey to E.U. (Eurostat, 2006)

Products (Sitc Sections) by order of importance	Mio euro	%	Share of total EU imports
TOTAL	33 492	100.0	2.8
Machinery and transport equipment	11 834	35.3	3.1
Miscell. manuf. Articles	9 325	27.8	5.6
Manuf goods classif. chiefly by material	6 099	18.2	5.2
Food and live animals	2 455	7.3	4.5
Chemicals and related prod., n.e.s.	710	2.1	0.8
Crude materials inedible, except fuels	708	2.1	1.5
Mineral fuels, lubricants and rel. Materials	464	1.4	0.2
Beverages and tobacco	157	0.5	3.3
Commodit. and transactions n.e.c.	143	0.4	0.6
Animal and vegetable oils, fats and waxes	118	0.4	2.9

Tablo 2.4 Export to Turkey from E.U. (Eurostat, 2006)

Products (Sitc Sections) by order of importance	Mio euro	%	Share of total EU exports
TOTAL	41 849	100.0	3.9
Machinery and transport equipment	20 804	49.7	4.3
Chemicals and related prod., n.e.s.	7 285	17.4	4.5
Manuf goods classif. chiefly by material	4 868	11.6	3.6
Miscell. manuf. Articles	2 846	6.8	2.4
Mineral fuels, lubricants and rel. Materials	1 136	2.7	2.9
Crude materials inedible, except fuels	968	2.3	5.0
Commodit. and transactions n.e.c.	693	1.7	2.4
Food and live animals	384	0.9	1.1
Beverages and tobacco	314	0.8	2.0
Animal and vegetable oils, fats and waxes	63	0.2	2.6

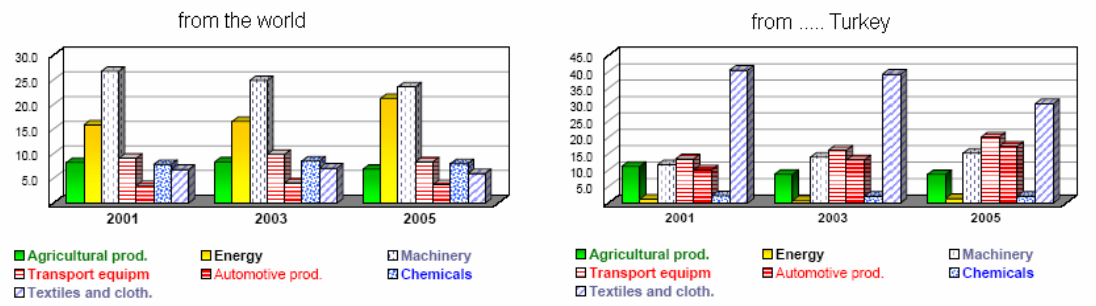

Figure 2.1 Structure of Exports of European Union by Product Grouping (Eurostat, 2006)

2.2 History of Turkey towards E.U. and Key Events

Turkey first applied for associate membership in the European Economic Community in 1959, and finally signed the Agreement Creating An Association Between The Republic of Turkey and the European Economic Community (the "Ankara Agreement") on 1963-09-12. This agreement came into effect the following year on the 1964-12-01.

The Ankara Agreement sought to integrate Turkey into a customs union with the EEC whilst acknowledging the final goal of membership. In November 1970, a further protocol established a timetable for the abolition of tariffs and quotas on goods traded between Turkey and the EEC. 1980 saw a temporary freeze in relations as a result of the 1980 military coup following political and economic instability,

though the recommencement of multiparty elections in 1983 saw Turkish-EEC relations fully restored.

On 14 April 1987, Turkey submitted its application for formal membership into the European Community. The European Commission responded in December 1989 with a refusal to begin accession negotiation. Although confirming Ankara's eventual membership, Turkey's economic and political situation, as well its poor relations with Greece and conflict with Cyprus were cited as creating an unfavorable environment with which to begin negotiations. This position was confirmed again in the Luxembourg European Council of 1997 in which accession talks were started with central and eastern European states and Cyprus, but not Turkey.

During the 1990s, Turkey proceeded with a closer integration with the European Union by agreeing to a customs union in 1995. Moreover, the Helsinki European Council of 1999 proved a milestone as the EU recognized Turkey as a candidate on equal footing with other potential candidates. The next significant step in Turkish-EU relationships came with the December 2002 Copenhagen European Council. According to it, "the EU would open negotiations with Turkey 'without delay' if the European Council in December 2004, on the basis of a report and a recommendation from the Commission, decides that Turkey fulfills the Copenhagen political criteria".

With the 2002 election of the Justice and Development Party (AKP), a pro-European party with Islamist roots, a number of reforms led to increasing stability both politically and economically. As part of the drive to enter a reunified Cyprus into the EU, the Turkish government supported the UN-backed Annan plan in 2004. The plan was accepted by Turkish Cypriots, but rejected by the Greek Cypriots. At the same time, a three-decade-long period of hyperinflation ended, with inflation reduced to 6% from annual levels of 75% during the mid-90s.

Oddly enough however, Greece was the first country to support Turkey's accession into the EU. Greece voted yes for Turkish entrance because they believe, even though Turkey is politically and socially behind at the moment, that with the help of the EU, they can make enough changes to put them up to par with other European nations.

The political reform program of the Erdoğan government continued. This included the abolition of the capital punishment, crackdown on torture, and more rights for its Kurdish population. In response to these developments, the European Commission recommended that the negotiations should begin in 2005, but also added various precautionary measures. The EU's leaders agreed on 2004-12-16 to start accession negotiations with Turkey from 2005-10-03. Despite an attempt by the Austrian government to offer Turkey less than full membership, EU accession negotiations were officially launched.

Turkey's accession talks have since been dogged by a number of domestic and external problems. Several European states such as Austria have made clear their reluctance to allow a large and populous Muslim country into Europe. The issue of Cyprus continues to be a major obstacle to negotiations. European officials have commented on the slowdown in Turkish reforms which, combined with the Cyprus problem, has led the EU's enlargement commissioner to warn of an impeding 'train crash' in negotiations with Turkey. Despite these setbacks, Turkey has closed its first chapter in negotiations in June 2006.

According to latest internal EU report from June 2006, Turkey faces increasing nationalism, continuing religious and ethnic discrimination, prosecution of dissenting, pacific opinions and excessive military involvement in politics.

Based on what it views as lukewarm support for its accession to the EU and alleged double standards in its negotiations (France and Austria have indicated they will hold referendums on Turkey's membership), the Turkish public has become increasingly euroskeptic in recent times. A mid-2006 Eurobarometer survey revealed that 43% of Turkish citizens view the EU positively; just 35% trust the EU, 45% support enlargement and just 29% support an EU constitution. It is believed that the accession process will take at least 15 years. The earliest date that Turkey could enter the EU is 2013, the date when the next six-year EU budget will come into force (2013-2019).

- **September 1959**: Turkey applies for associate membership of the European Economic Community (EEC).

- **September 1963**: An association agreement (known as the Ankara Agreement) is signed, aiming at bringing Turkey into a Customs Union with the EEC and to eventual membership. A first financial protocol to the initial agreement is also signed.
- **November 1970**: The Additional Protocol and the second financial protocol are signed in Brussels, preparing the ground for the establishment of the customs union.
- **14 April 1987**: Turkey makes an application for full EEC membership.
- **1995**: Turkey-EU Association Council finalizes the agreement creating a customs union between Turkey and the EU.
- **December 1997**: At the Luxembourg Summit, Turkey is declared eligible to become a member of the European Union.
- **December 1999**: EU Helsinki Council recognizes Turkey as an EU candidate country on an equal footing with other candidate countries.
- **March 2001**: The EU Council of Ministers adopts the EU- Turkey Accession Partnership.
- **March 2001**: The Turkish government presents its National Program for the Adoption of the Acquis.
- **September 2001**: Turkish parliament adopts a major constitutional reform in order to meet the Copenhagen political criteria for EU membership.
- **August 2002**: Parliament begins to introduce political and human rights reforms designed to meet the Copenhagen political criteria.
- **13 December 2002**: The Copenhagen European Council resolves that if the European Council in December 2004, on the basis of recommendation from the Commission, decides that Turkey fulfils the Copenhagen political criteria, the EU would open accession negotiations. Meanwhile, EU leaders agree to extend and deepen co-operation on the EC-Turkey Customs Union and to provide the Turkish government with increased pre-accession financial assistance.
- **May 2003**: The EU Council of Ministers decides on the principles, priorities, intermediate objectives and conditions of the Accession Partnership with Turkey.

- **October 2004**: The Commission presents its "Recommendation of the European Commission on Turkey's Progress towards accession" along with its paper "Issues Arising from Turkey's Membership Perspective."
- **17 December 2004**: The European Council defines the conditions for the opening of accession negotiations.
- **May 2005:** Appointment of State Minister Ali Babacan as Chief negotiator with the EU.
- **June 2005:** The Commission adopts its proposal for a revised Accession Partnership and a Communication on the civil-society dialogue between EU and Candidate countries. This communication sets out a general framework on how to create and reinforce links between civil society in the EU and candidate countries. The dialogue will have a special focus on Turkey, as the state of mutual knowledge is particularly weak with that country and misconceptions and concerns more widespread.
- **03 October 2005:** Adoption by the Council of a Negotiating Framework setting out the principles governing the negotiations followed by the formal opening of Accession negotiations with Turkey.
- **October 2005:** Starting of the screening process concerning the analytical examination of the acquis.
- **December 2005**: Adoption by the Council of a revised Accession Partnership for Turkey.

CHAPTER THREE

MINING INDUSTRY AND ENERGY IN TURKEY

3.1 Energy

Turkey is a land bridge for the distribution of oil and gas from the Caspian and Central Asian regions to world markets. The Baku-Tbilisi-Ceyhan oil and Blue Stream gas pipelines are only the first designed to enhance energy transit through Turkey and allow for expansion of domestic distribution networks. This makes Turkey a promising market for pipeline construction and rehabilitation, engineering, equipment and materials, as well as oilfield equipment. Turkey's demand for electric power is spurring plans to develop hydro resources and possible long-term plans for nuclear power. The liberalization of the electricity market and privatization of domestic gas distribution will allow easier access for foreign investment in these areas.

The share of natural energy resources of Turkey in the World reserves are: coal 0.6% geothermal 0.8% and hydro 1%. However, petroleum and natural gas reserves are quite limited.

Indigenous energy production meets nearly 48% of the total primary energy demand. Domestic production is planned to be nearly doubled by 2010, mainly in coal (lignite) which, at present, accounts for almost half of the total energy production. The hydropower should also increase two-fold over the same period.

Primary energy resources, which are produced in Turkey, are hard coal, lignite, asphaltite, petroleum, natural gas, hydroelectric energy and geothermal energy.
Lignite is the dominant source of energy produced in Turkey. Nearly 75% of the indigenous lignite is consumed in thermal power plants.

The gross electricity production in Turkey reached to 122724 GWh in 2001. Thermal energy is the source of 80.3 % of production, hydroelectric energy makes

19.6% of it. Coal, lignite and imported coal accounted for 31.3%, fuel oil 7.2 %, and natural gas 40.4% of thermal electricity production. The installed electricity capacity of Turkey increased by 4% and reached about 28332 MWh in 2001. Electricity consumption of Turkey decreased to 1870 kwh/person in 2001.

Turkey is seeking private sector's involvement in large energy projects. Electricity demand of Turkey is growing rapidly with the rate of increase of 8% in average for many years. To meet the demand, the construction of new generation facilities and increasing the efficiency and availability of present power plants will be necessary. Hence, the participation of both foreign and local private companies in energy sector is promoted. Legal framework for private energy investments aims increased private capital investment, improved management and reduced cost of energy.

Current legal framework in Turkey allows private companies to construct new power plants either under Build-Operate-Transfer (BOT) or Build-Operate (BO) models or as Autoproducer. Also, private companies are allowed to operate available power plants by receiving their operational rights through Transfer Operational Rights (TOR) scheme. Turkey offers many power generation projects under these models. The Turkish energy sector is characterized by a strong public sector presence with many state enterprises holding monopoly positions. The energy sector of Turkey is supervised by the Ministry of Energy and Natural Resources (MENR). For liberalization in the energy market The Energy Market Regulatory Authority (EMRA) has been established upon the "Electricity Market Law"no: 4628 and "Natural Gas Market Law" no: 4646. It has started to act in 19 November 2001. The new regulations include the following key elements:

• An autonomous Energy Market Regulatory Authority, governed by the Board,
• A new licensing framework for market participants,
• An energy market, to based on bilateral contracts between market participants,
• Eligible consumer concept, to ensure freedom for eligible consumers to choose their suppliers,

A transition mechanism to be implemented over a two year program for the electricity market and 1.5 year program for the gas market.

Table 3.1 Electricity Production by Source (GWH) Primary Energy Production 2001 (Ministry of Energy and Natural Resources Electricity, GWH)

Primary Energy Production	**2001**
Solid Fuels	
Hard Coal	2705.7
Lignite	34371.5
Imported coal	1340.3
Liquid Fuels	
Fuel Oil	8816.6
Motorine	904.0
Natural Gas	49549.2
LPG	162.1
Naphta	483.5
Renew +waste+others	229.9
Thermal Total	98562.8
Geothermal	89.6
Wind	62.4
Hydro-electric	24009.9
General Total	122724.7

Table 3.2 Electricity (Ministry of Energy and Natural Resources, GWH)

	2000	**2001**	**Rate of Increase (%)**
Installed Capacity(MW)	27 264	28 332	4
Gross Production	124 922	122 725	-2
Hydro	30 879	24 010	-22
Thermal	93 934	98 563	5
Geothermal + wind	101	109	7
Import	3 791	4 579	21
Export	437	433	-1
Total Final Consumption	128 276	126 871	-1
Per Capita Gross Consumption (kwh/person)	1 968	1 870	-5

3.2 Mining

Turkey has significant geological potential and is very much under explored. The country's new mining law, which provides incentives for investment in mine operations, exploration and development, is expected to encourage foreign investment in this sector. Major opportunities exist in upgrading facilities for mining boron, coal, zinc, copper, gold and silver, as well as iron ore, bauxite and lead. Other opportunities include engineering services and equipment supply.

Turkey had a diverse mineral industry that featured a robust industrial minerals sector. The nation was a leading producer of barite, boron minerals, celestite (strontium), chromite, emery, feldspar, limestone, magnesite, marble, perlite, and pumice and was a significant source of value-added processed mineral commodities, which included refined borates and related chemicals, cement, ceramics, glass, and steel.

Mining and quarrying accounted for about 1.2% of the GDP; much of the mineral industry's contribution to the economy, however, was in the processed commodity sector, which was lumped in Turkey's manufacturing statistics. In 2002, manufacturing accounted for 24.7% of the GDP (State Institute of Statistics, 2003). Linking Asia and Europe, Turkey also has emerged as a major energy transit corridor. The Iran-Turkey gas pipeline moved Iranian gas into Turkey.

The Blue Stream Pipeline, which transited beneath the Black Sea from Dzhugba, Russia, to Samsun, Turkey, was to begin supplying Russian natural gas to Turkey in 2003. The proposed South Caucasus gas pipeline was to deliver Azerbaijani natural gas to Turkey in 2006. Connection of the natural gas pipelines with the European gas network would provide an alternative route to allow surplus Eurasian natural gas to flow into Europe. Turkey hosted the western section of the Iraq-Turkey pipeline, which, in 2002, moved 175 million barrels of Iraqi crude oil to the Çeyhan oil export facilities at Yumurtalik. The Yumurtalik docks also were the proposed terminus of the Baku-Tbilisi-Çeyhan oil pipeline.

In 2002, total Turkish exports were valued at $35.8 billion compared with $31.3 billion in 2001. Total imports were valued at $51.3 billion in 2002 compared with $41.4 billion in 2001 (State Institute of Statistics, 2003). The European Union (EU) received 51.5% of Turkish exports (by value); countries of the Middle East, 9.8%; and the United States, 9.2%. In 2002, the EU accounted for 45.5% of total Turkish imports (by value); the Middle East, 7.1%; and the United States, 6% (State Institute of Statistics, 2003c§-e§). Turkey was a candidate for EU membership; accession negotiations could begin in late 2004 (Commission of the European Communities, 2003).

In 2002, exports of mineral- and chemical-based commodities and products were valued at about $5.5 billion. These were predominately iron and steel exports (bars, billets, pipes, flat rolled products, sections, and wire), which were valued at about $3 billion.

Exports included iron and steel bars, which were valued at $886 million; mineral fuels and petroleum products, $661.8 million; jewelry, $591.3 million; steel billet, $555 million; glass and glassware, $466 million; steel pipe, $320 million; steel wire rod, $235 million; inorganic chemicals, $219 million; worked marble and travertine, $219 million; cold-rolled flat steel, $124 million; steel sections and profiles, $118 million; hot-rolled flat steel, $117 million; aluminum bars and profiles, $110 million; plated or coated flat steel, $91 million; borates and concentrates, $90 million; aluminum flat products, $87 million; copper wire, $66 million; steatite and talc, $62 million; marble, onyx, and travertine blocks and slabs, $59 million; copper ores and concentrates, $50 million; feldspar, $44 million; and magnesite, $37 million. Compared with 2001, lead ore and concentrate exports increased by almost 258% to $6.6 million in 2002.

Other commodities with significant changes in the value of exports in 2002 compared with 2001 included ferrochrome, with almost a 124% increase to $27 million; iron oxide pigment, a 119% increase to $4 million; steatite and talc, a 90% increase; steel billet, a 65% increase; quartz, about a 63% increase to $4 million; salt,

about a 59% increase to $2 million; mineral fuels, oils, and products, a 53% increase; plated or coated flat steel, about a 49% increase; jewelry, a 38% increase; worked marble and travertine, a 38% increase; marble, onyx, and travertine blocks and slabs, a 28% increase; blister copper, about a 24% decrease to $9 million; cold-rolled flat steel, about a 24% decrease; hot-rolled flat steel, a 26% decrease; and copper wire, about a 34% decrease (Istanbul Mineral and Metals Exporters' Association, 2003).

3.2.1 Structure of the Mineral Industry

The private sector dominated the country's industrial mineral and metal exploration sectors in 2002. Private sector enterprises included exploration and production companies owned by domestic and foreign stockholders, mining or manufacturing subsidiaries of Turkish conglomerates, and medium and small privately owned mining companies. State-owned companies remained significant producers of borates, fuels, and metallic ores. The Ministry of Energy and Natural Resources oversaw the mineral industry. All mineral rights were reserved to the Government.

Table 3.3 Mining Exports of Turkey by Major Products in 2001: 1000 Tons Value: US$ Million

Products	**Quantity**	**Value**
Borates	446	89
Natural Stone (block)	539	56
Magnesite	230	36
Copper and concentrates	151	33
Chromium ores and conc.	321	24
Feldspar	1 225	24
Zinc ores	88	18
Pumice stone	108	7
Barytes	137	7
Kaolin	210	5
Total	3 455	299

Table 3.4 Selected Minerals of Production (Turkey's Statistical Yearbook, 2004)

Production of selected minerals (Ton - Tons)

	1997	1998	1999	2000	2001*
Hard coal					
Run of mine	3 645 896	3 350 152	3 047 328	3 251 495	3 369 727
Lignite					
Run of mine	56 461 362	61 197 608	64 200 392	62 953 326	58 172 982
Natural gas and crude petroleum					
Crude petroleum					
Production	3 363 877	3 223 626	2 905 771	2 768 549	2 559 946
Natural gas					
Production (m^3)	250 804 734	561 994 565	718 270 214	605 227 713	265 773 662
Metal minerals					
Iron					
Run of mine	5 986 900	5 965 942	4 932 213	4 060 561	4 434 621
Chrome					
Run of mine	1 646 413	1 517 908	986 544	642 923	454 549
Copper					
Run of mine	3 794 630	4 043 869	4 283 169	4 478 600	3 464 656
Lead-Zinc					
Run of mine	262 260	283 199	316 223	362 101	388 795
Bouxite					
Run of mine	369 482	459 028	207 743	458 537	242 040
Nonmetallic minerals					
Magnesite					
Run of mine	2 050 818	2 312 513	2 742 888	2 688 289	2 598 767
Boron					
Run of mine	2 602 386	2 754 082	2 554 404	2 411 661	2 357 592
Sodium sulfate					
Run of mine	437 999	294 808	276 870	394 609	467 232
Barite					
Run of mine	179 393	130 155	78 685	59 457	57 373
Pyrite (include copper)					
Run of mine	559 500	742 820	1 048 494	561 564	662 872

Table 3.5 Number of establishments in mining sector (Turkey's Statistical Yearbook, 2004)

	1997	1998	1999	2000	2001*
Number of establishment	2 092	2 041	1 954	1 800	1 767
Annual average of persons engaged	77 093	73 290	72 754	75 056	73 628
Total man-hours worked	153 762 519	143 819 804	139 157 241	148 829 197	183 111 557
Annual payments to employees (000 000 TL)	93 843 918	147 462 944	290 967 957	513 949 825	668 858 411
Gross additions to fixed assets during the year (000 000 TL)	47 806 015	137 989 926	85 192 953	135 413 689	142 453 443
Input (000 000 TL)	82 063 476	177 563 896	264 480 374	430 374 761	640 168 579
Output (000 000 TL)	495 968 131	754 087 738	1 354 908 106	2 010 436 538	2 916 639 058
Value added (000 000 TL)	413 904 655	576 523 842	1 090 427 732	1 580 061 777	2 276 470 479

The Government promoted foreign investment in the development of most mineral commodities, and the industrial minerals, the metals, and the mineral fuels sectors all received some foreign investment. International mineral companies formed local subsidiaries because only Turkish citizens, Turkish corporate entities, and State mining companies could hold mining claims under Article 6 of the Turkish Mining Law of 1985. In 2002, the majority of foreign investment in the mineral

industry was channeled into funding gold exploration compared with the 1990s when it was directed towards acquiring interest in the cement companies that the Government privatized. The gold sector remained focused on legal developments concerning the Ovacık Mine of Newmont Madencilik A.Ş. Repeated lawsuits have challenged the Government's authority to issue permits that allow Newmont to use cyanide.

The Government had embarked on a privatization program in 1989 to promote more efficient allocation of Government resources. The financial burden of Government-owned companies on the national budget had overpowered the societal benefits that the state-owned companies accrued as significant employment centers. Reduction of the state's involvement in the industrial and other sectors of the economy has expanded the capital market as domestic and foreign interests acquired ownership interest in the companies.

The Privatization Administration was responsible for implementing preparations for the privatization of Government-owned companies. In 2002, mineral operations held by the Privatization Administration included the barite grinding plant, the chrome mines, and the ferrochrome and ferrosilicon plants of Eti Elektrometalurji A.Ş.; the copper mines of Eti Bakir A.Ş.; the copper smelter of Karadeniz Bakir Işletmeleri A.Ş.; the ferrochrome plant of Eti Krom A.Ş.; the fertilizer companies of Türkiye Gübre Sanayii A.Ş.; the iron ore mines of Divriği Hekimhan Madenleri Sanayi ve Ticaret A.Ş.; the petroleum refineries of Türkiye Petrol Rafineleri A.Ş. (TÜPRAŞ); the domestic and foreign steel operations of Ereğli Demir ve Çelik Fabrikalari T.A.Ş.; the steel plant of Türkiye Demir ve Çelik Işletmeleri A.Ş.; and the silver mine and plant of Eti Gümüş A.Ş. The divestment of Government-owned mineral enterprises slowed in 2002 when the privatization of TÜPRAŞ was postponed until 2003. Other mineral companies scheduled to be privatized in 2003 included Eti Bakir, Eti Gümüş, Eti Krom, and Türkiye Gübre.

3.2.2 Metals

Chromium, The operation of Eti Krom's four highcarbon ferrochromium furnaces, which were located about 50 kilometers east of Elaziğ, was temporarily suspended in 2001 and remained idle in 2002. The temporary closure of the furnace activity also adversely affected the mining companies that had contracted to supply ore to Eti Krom. In 2002, exports of high-carbon ferrochrome came from stockpiled material. Improved international market conditions were anticipated in 2003, and Eti Krom expected to restart one or two of its furnaces.

Copper, despite a 6-week suspension of mining after a series of ground falls in October, Çayeli Bakir Isletmeleri A.Ş. the joint venture of Inmet Mining Corp. (55% equity interest) and Eti Holdings A.Ş. (45%)] reported that 895,000 metric tons (t) of ore was milled and that concentrates which contained 32,600 t of copper and 33,100 t of zinc were recovered in 2002 compared with 33,000 t of copper and 25,300 t of zinc in concentrates produced in 2001. After rehabilitation of the main access ramp, ore production was resumed in December 2002 at about 50% of capacity. Çayeli expected to resume production at full capacity by March 2003. In 2002, the company completed a new tailings pipeline and proposed a 3-year program to deepen the main shaft, to expand plant capacity to 1.25 million metric tons per year (Mt/yr), and to move its concentrate export facilities from Rize to a new port (Inmet Mining Corp., 2003, p. 10-11; International Finance Corporation, 2003).

Gold, in 2002, Newmont Madencilik was formed after Newmont Mining Corp. of the United States acquired Normandy Mining Ltd. of Australia (and its Turkish subsidiary Normandy Madencilik A.Ş., which had operated the Ovacık Mine near Bergama). As the first foreign-operated mine to use cyanide to recover gold, the Ovacık Mine continued to be a target for legal action. In 2002, the mine operated under temporary licenses pending the appeal of a June 2001 judicial order that canceled Ovacık's operating permits. Revocation of Ovacık's operating permits could adversely affect the development of most of the other proposed gold mines. Gold production from the Ovacık operation was more than 3,900 kilograms. In 2003, production from Ovacık's underground operations was scheduled to supplement ore

from the open pit (Newmont Mining Corp., 2003, p. 23, 57, 144; Arol, 2002§). In 2002, the Yeni Anadolu Mineral Madencilik San. Ve Tic. Ltd. Şti. (YAMAS) (a subsidiary of Anatolia Minerals Development Ltd. of the United States) joint venture with Rio Tinto Mining and Exploration Ltd. continued to explore for gold in Turkey. Activity included drilling and metallurgical studies of recovered material on the Cöpler (formerly the Çükürdere) prospect and aeromagnetic, stream sediment geochemistry, and geologic studies on the Tunceli prospect. The joint venture also explored the Central Anatolia and the K-C District prospects. YAMAS also explored the Gelemic, the Kabataş, the Karagöz, the Tufanbeyli, and the Üçkapili properties. Tüprag Metal Madencilik San. ve Tic. Şti. (a subsidiary of Eldorado Gold Corp. of Canada) completed a 29-hole, 7,600- meter (m) reverse circulation drill program and about 3,000 m of core and infill drilling on its Kisladag gold prospect. Hatch Associates Ltd. was awarded the contract for a feasibility study that was expected to be completed in March 2003. Preliminary design of the operation envisioned ore production of 5 Mt/yr for 4 years with an expected output of 4,400 kilograms per year (kg/yr) of gold followed by an increase to 7,200 kg/yr of gold associated with an expansion of the mine and processing facilities to a throughput of 10 Mt/yr of ore (Eldorado Gold Corp., 2002; Northern Miner, 2002).

Odyssey Resources Ltd. of Canada continued to acquire mineral properties in Turkey. In 2002, Odyssey agreed to acquire the rights to the Altintepe gold property from Cominco Madençilik Sanayii A.S. in addition to the Kabatash copper molybdenum, gold and the Korgon gold properties from the Turkish Government and the Trab 23 copper-gold-molybdenum property from BHP Billiton World Exploration Inc. In June, Odyssey announced that it had entered into a joint-venture agreement with BHP Billiton to explore for copper and gold in eastern Turkey. In December, Yildiz Arama ve Madencilik San. ve Tic. A.Ş. (a local subsidiary of Odyssey) began a diamond drill program at Altintepe.

Iron and Steel, In 2002, steel production jumped about 11% to 16 million metric tons (Mt); Ereğli Demir ve Çelik Fabrikalari T.A.Ş. accounted for 4.45 Mt (Metal Bulletin, 2003a). To feed their electric arc furnaces, Turkish steelmakers imported

from about 6 to 8 Mt/yr of ferrous scrap. In recent years, they had turned to Romania, Russia, Western Europe, and the Ukraine for much of their scrap needs (Metal Bulletin, 2003c). In late 2002, the Turks again became significant importers of ferrous scrap from the United States. Total ferrous scrap imports from the United States in 2002 was 495,905 t compared with 1.83 Mt from Ukraine, 1.80 Mt from Russia, 1.25 Mt from Romania, and 1.03 Mt from the Netherlands. Steel minimills in Turkey had been a leading market for U.S. steel scrap in the early 1990s. Turkish imports of ferrous scrap from the United States had been about 1.2 Mt in 1994, 1.3 Mt in 1993, and 1.8 Mt in 1992 (Metal Bulletin, 2003).

The iron and steel industry, which has been the backbone of industrialization in Turkey and the provider of raw materials for many sectors, had first begun its operations in 1939. Today this sector, which is composed of 18 companies, is the 2nd largest exporting sector within the Turkish economy. The sector has reached a production capacity of 19,8 million tons, which provided for %1,7 of global steel output in the year 2000 and has ranked Turkey as the 17th largest steel producing country in the world.

Today, there are a total of 17 private and one state-owned manufacturer that function with a production capacity that ranges from 100 thousand and 2 million tons per year. There are 15 electrical arc furnaces with a total capacity that ranges from 400.000 tons to 2.000.000 tons per year. These 15 mills represent 13.6 million tons or 69 % of the 19.8 million tons of the sector's production capacity. Also there exists three integrated iron and steel manufacturers, all of which are privately owned, one located in Karabuk; the other in Eregli (ERDEMIR) and the other located in Iskenderun (ISDEMIR) which has recently been privatized.

These manufacturers have a total production capacity of nearly 5.9 million tons per year, 31% of total national raw steel capacity. On the other hand electric arc furnace capacity levels at 13.6 million tons per year and the mini-mill sector which has grown has led to a 5.4% rise in steel output in the 1st nine months of 2001. Of the 19.8 million tons of total production capacity reached in the year 2000, 16.5

million tons, or 83% was for long-steel products, which are mostly used in the construction sector.

Three million tons (15%) of the raw steel capacity was directed to flat products, and the remaining 482 thousands tons (2%) was directed to special steel products. The only state owned enterprise is MKEK, which has a 0.07% share of the Turkey's total production capacity with its 10.000 tons of raw steel production capacity. The 4.6% production increase in the iron and steel industry that persisted through out the year 2001 started to reflect the adverse effects of the crisis and began to contract in 2002.

The contraction in Turkey's internal markets, such as in the construction and automotive sectors, have slowed down the iron and steel industry by 6.7% in the first 2 month of 2002. As for foreign trade, while economic crises in Southeast Asia and Russia and the recent one in Turkey has had negative effects on the sector, exports have recovered.

Exports, which reached 2.3 million USD in 2000 rised 36.5% in terms of quantity and 28.2% in terms of value in the year 2001. However, protectionist policies of countries such as Israel, Egypt, and the US raised concerns within the Turkish iron and steel industry, which comprises 8.33% of all Turkish exports. Turkey exports steel products to about 151 countries and its major export partners are USA, Italy, Greece, Israel, UK, Germany and the Middle East.

An agreement signed with the European Coal and Steel Community (ECSC) in 1952 will be ending in 25 July 2002 and all customs duties concerning steel trade will be mutually abolished. However, Turkey prefers the step-by-step inclusion of the 280 products listed under the ECSC to the customs union, which will mark a new era of trade relations between the EU, Turkey and 3rd countries. On the other hand Turkey's number one steel export partner; the US, has currently launched the Bush Plan which entails the implementation of new tax and tariffs up to 30 percent on steel imports, intended to help U.S. steel makers. While the Bush plan exempts four

countries; Canada, Mexico, Israel and Jordan, it excludes Turkey whose iron and steel industry heavily relies on the exportation of its products due to contractions in local demand. However, according to the regulations of the World Trade Organization (WTO) Turkey is outside the scope of the taxes imposed by Bush as long as the exports of a certain product remains below 3 % of US's total steel import.

Construction iron which is the only product that exceeds the 3% level will cost the Turkish producers with customs duties at 15% the 1st, 12% the 2nd and 9% the 3rd year. From the $ 2 billion that Turkey had earned through construction iron exports, trade worth $187 million had been conducted with the US. The 0.7 % contraction of global steel production, global reduction in steel prices, protectionist policies, Turkey's plummeting internal demand curve, the raising cost of electricity, have all contributed to the %6.7 reduction in the quantity and %12-13 fall in value of Turkish iron and steel products in the 1st two months of 2002.

In 2001, the Turkish steel industry had increased output by 4.6 % to 15m tons and exports had increased by 29.7% in spite of the halt in investments and the 8.5% contraction in domestic demand. This trend reveals Turkey's dependency on exports to maintain a certain production quantity at a time that internal markets are shook by crisis. Turkey is an importer of large quantities of flat products (3mn. tons with a 10% increase each year) since the domestic production does not meet the demand. In the year 2000, 32% of iron and steel imports was comprised of flat products, which exceeded 1 billion USD.

While Turkey has about 5 million tons of excess production of long products, and exports of long products accounted in value for 44% of the total steel exports in the year 2000, she faces an aggregate of about 4 million tons of deficiency in flat steel production. While the production of flat products accounts for 60% of total steel products in the developed countries, long products account to 80% of the total steel products in Turkey, leaving a slice as slim as 20% for the production of flat products.

This discrepancy indicates the necessity to balance the long/flat ratio by restructuring existing plants, and modernizing these plants to start producing flat products. This requires the expansion of Erdemir's production capacity and the transformation of İsdemir to a flat products producer. Only through modernisation and restructuring can the capacities of existing plants increase and products diversify, thus alleviating the pressure on long product exportation.

Erdemir aims at investing in the in diversifying its products decrease it production costs and produce high quality products. Also the high cost of iron gem production and its transportation cost have obliged Turkey to import 4mn.500 thousand tons of its 10mn.tons of annual requirement, by paying 140 million USD in exchange for the acquisition of iron gem in order to be used in integrated plants. The modernization of iron gem search mechanisms and production facilities is another area that requires investment.

Turkey is also one of the biggest scrap iron importers. In 1999, 660 million USD worth 8 mn tons of scrap iron was imported to be used in the electrical arc furnaces. 3-4 billion USD worth of an investment portfolio is necessary for the restructuring of the 3 integrated plants. Neither the Turkish private sector nor the state which would be charged high interest rates for borrowing in dollars can provide the necessary capital for the restructuring of the iron and steel industry. Thus, there appears to be great opportunities for foreign investors, in the Turkish iron and steel industry, which maintains its strong position in global competition despite contractions in internal demand and high production costs.

Unfortunately the potential for foreign investments are not fully realized as reflected in the number of foreign investment permissions issued by the government in 2001. Seven permissions were granted, equaling $106,286,84, which neither reflects the needs of the Turkish industry nor the benefits of investing in the 2nd largest export sector in the Turkish economy. Currently there are no foreign partnerships in the iron and steel sector and investment opportunities are

circumscribed by investments for modernisation, which have been determined by product kinds.

In the year 2001 investment incentives given by the government reached 1.507 trillion TL, encompassing 23 projects, which was the highest amount of the past 12 years. 17 of the projects entail modernization and restructuring of existing plants while 5 were given for the initiation of entirely new investments in the sector. The financing of the project requires a foreign capital investment of 788 million USD. With the transfer of İsdemir, which is one of the long iron producers, to Erdemir, which is Turkey's only flat iron producer, Erdemir is estimated to have an investment portfolio of 700 million USD between 2002-2010 to finance this transfer.

Erdemir conducted 37% of its sales to foreign countries in the year 2001 and deems Europe the best export market and aims at transforming 75% of İsdemir's capacity to produce flat product production. Turkey's per capita steel consumption, which is 211 kg, is quite below the levels of steel consumption in the developed countries, which ranges from 400-1000 kg per person. This significant difference suggests future growth as the Turkish iron and steel industry learns to transform the crisis into an opportunity to minimize costs and become more competitive in local and global markets.

In December 2002, Ukraine announced that it would charge a tariff of 30 euro (€) per metric ton (about $30 per metric ton at the average exchange rates of December 2002) on ferrous scrap exports effective January 1, 2003, which was expected to reduce the demand from Turkish steel mills. Russia had imposed a 15% tariff on ferrous scrap exports in 1999. At yearend, the price of Russian export scrap was about $120 per metric ton (Cundy, 2002).

Lead and Zinc, In early 2002, Yildiz continued its diamond drilling program on the Lucky Star lead-zinc prospect. Mixed conclusions from the analysis of the Lucky Star’s mineralization resulted in Odyssey’s shift in exploration interest toward gold.

Nickel, European Nickel plc of the United Kingdom entered the Turkish mining sector in December when it acquired an option on the Caldag nickel deposit, which is located near Izmir. European Nickel formed Bosphorus Nickel Mining Ltd. to mine about 480,000 metric tons per year (t/yr) of nickel-cobalt ore that was to be shipped to Larco G.M.M.S.A., which was a ferronickel producer in Greece (Mining Journal, 2002).

Russian gas, which entered Turkey via the main transmission line from Russia through Bulgaria to Ankara, Turkey, should be supplemented in 2003 by gas piped under the Black Sea in the Blue Stream Pipeline. The Blue Stream Pipeline was completed in October 2002, and commercial gas shipments were expected to begin in 2003. Turkish officials obtained discounts on contracted gas prices and reduced take-or-pay volumes from Russia gas supplies transiting the Blue Stream Pipeline. Liquefied natural gas from Algeria and Nigeria was landed at the Marmara Ereglisi import terminal and regasification plant.

Oil, Domestic crude oil production continued to decline. In 2002, it only satisfied about 9% of national oil consumption. In 2002, production of the Government-owned Türkiye Petrolleri A.O. (TPAO), which was the country's largest oil producer, was down to about 12.3 million barrels (Mbbl) from 12.8 Mbbl in 2001 (Turkish Petroleum Corp., 2003). TPAO accounted for 70% of national production.

3.2.3 Environment

Improved standards regarding sewage and medical and industrial waste, along with pressures to conform with European environmental standards contribute to the growth of this sector and create opportunities for sales of pollution control equipment, municipal waste water treatment, solid waste disposal and incineration of medical waste. Another area of opportunity is environmental impact assessment for the Turkish mining and energy industries.

CHAPTER FOUR

E.U AND MINING ACTIVITIES

4.1 Mining Activities

Europe is rich in natural resources and the extraction and supply of minerals continue to play a crucial role in the European economy and society as it has done for thousands of years. Minerals are used in every-day life, as construction materials (crushed rock, sand and gravel) for infrastructure, buildings, and roads, and for industrial purposes (e.g. metals, lime, kaolin, silica sand, talc) in the production of steel, cars, computers, medicines, human and animal foodstuffs, and fertilizers to name a few. To a large extent, demand for the wide range of minerals produced in the EU is strongly influenced by the business cycle of downstream sectors, such as the construction and steel-making sectors. In this respect, the industry differs from many forms of manufacturing.

The non-energy extractive industry in Europe that is excluding minerals used for fuel is usually divided into three sectors: metallic minerals, industrial minerals and construction materials. The total annual turnover of these three sectors in the EU is about 30 billion and direct employment in the EU sectors is estimated to be around 190.000 people. More than 70.000 people are estimated to be employed in the industry in the EU enlargement countries. It is estimated that the indirect employment provided by the industry is up to 4 times than the directly employed.

The three sectors are characterized by their exceptional diversity. The construction minerals sector is by far the largest in terms of tonnage and sales revenue. It consists predominantly of small and medium sized enterprises with over 20 000 sites supplying local and regional markets with materials such as sand and gravel and crushed rock (aggregates) for construction, railway ballast and armourstone for flood and coastal defense.

It also provides the raw material used in the manufacture of other vital construction products such as ready-mixed concrete, asphalt, lime and cement. gravel are also extracted from the seabed. In general, the widespread distribution of sand and gravel, and hard rock resources and the there is also a number of multinational quarrying companies, which supply more distant markets. Substantial amounts of sand and relatively low price of the product, means that transport costs significantly influence the marketability of these products. EU production in this sector meets over 20% of global demand.

The industrial minerals sector provides a wide range of minerals which can be loosely classified as either ‘physical’ minerals, that is, minerals valued for their physical properties, for example, calcium carbonates, diatomite, kaolin, plastic clays, bentonite, feldspar, silica, and talc or; ‘chemical’ minerals, that is minerals valued for their chemical properties, for example, borates, salt, potash and sulphur. Extraction is undertaken in all of the current EU Member States, although some countries have more significant production than others. There is a highly developed international trade for some industrial minerals. This sector in the EU is mainly composed of small and medium-sized enterprises. However, it also includes some of the world's leading international production companies, operating on a global basis such as in talc. Processing of the minerals before sale can be relatively simple (mainly crushing, grinding and classifying) but may also be more sophisticated for some mineral types (e.g. mineral sorting by flotation, laser optics, magnetic separation, or calcination).

The EU metal mining sector is composed of around 250 enterprises, which include some of the major multinational mining companies, which have their headquarters located in Europe. European companies compete in a global market and the majority of metallic ores are imported to supply the demand of the European metal industries.

The EU metal mining sector accounts for some 3% of world production, located in many but not all of the EU-15 countries, particularly in some of the more Northern countries, such as Sweden and Finland and the Southern countries of Greece, Spain

and Portugal. New mines continue to be developed, and provide employment and economic growth in regions, which would otherwise have difficulty in attracting other investment. Since metals, their ores and concentrates are traded on international markets; European metal mines face strong competition from large-scale, high-grade overseas operations capable of producing metal ores and concentrates under low cost competitive conditions.

The European Union, producing 193 million tonnes of crude steel, accounts for 18% of world production. China is the largest producer with 272 million tonnes (26% of world production), followed by Japan with 113 million tonnes and the USA with 99 million tonnes.

The value of the annual EU steel production is estimated at €21 billion, representing more than 1% of the Union's GDP. Employment in the steel sector has contracted steadily over the years, so much so that from 1 million people working in the sector in 1970 there are now just 347.000 employed which represent less than 1.5% of the total employment in the Union's manufacturing industries.

During the first 6 months of 2005, the European Union has seen its steel imports go up by 26% (from 11.8 to 14.8 million tonnes) which represented an increase of 3 million tonnes. At product level, significant increases could be seen in hot rolled coil (+ 1 million tonnes), quarto plate, cold rolled sheet, galvanized sheet, wire rod, and tubes (between + 0.2 and + 0.3 million tonnes each), and on the other hand, a decrease of almost 0.5 million tonnes in reinforcing bar. At the level of countries of origin, the most significant increase could be seen from China with 2 million tonnes which represents an increase of 79% compared to 2004. Turkey remain the EU's principal partner with 2.1 million tonnes. Followed by Switzerland, Brazil, India and Russia with 1, 0.9, 0.8 and 0.7 million tonnes.

During the same period, the European Union saw its steel exports stagnate at around 15.2 million tonnes. The increase in exports of hot rolled coil (+18%) was largely compensated for by drop in exports of quarto plate (-15%), beams (-20%), galvanized sheet (-24%) and wire rod (-28%). As far as exports destination are

concerned, the most significant decreases were to Iran and China, to which European exports have gone down a third compared to the same period in 2004.

Since end 2003, the world steel market became buoyant, demand increased substantially and supply had some difficulties to match it. The increase in demand is the result of the increase of the overall economic growth, mainly in South-East Asia , and in particular in China that acted as a giant magnet for steel products and related inputs (ferrous scrap, coke, iron ore). As a result, prices of steel products and of raw materials increased significantly.

In 2002, the EU has signed specific agreements with the Former Yugoslav Republic of Macedonia and Romania and in 2004 with Moldova, establishing a double checking system without quantitative limits in respect of certain steel products. The agreement with the Former Yugoslav Republic of Macedonia is concluded for a undefined period, the agreement with Moldova will lapse on 31.12.2006 and the agreement with Romania on the date of its accession to the EU.

The EU sector has made substantial efforts to reduce operation cost levels through rationalization, innovations and increasing capital intensity. Overall the minerals trade balance is negative, showing a strong dependence of the EU on imports for its raw material supply.

4.2 Energy and Environment

Energy subsidy reform and the environment. The sixth environmental action programme of the European Union encourages ‘reforms of subsidies with considerable negative effects on the environment and that are incompatible with sustainable development’ and emphasises the need to undertake ‘as soon as possible an inventory and review of subsidies that counteract an efficient and sustainable use of energy with a view to gradually phasing them out’ (European Parliament and Council, 2002).

According to the OECD (2004), ‘In general, subsidies supporting fossil fuels — particularly coal and oil represent greater threats to the environment than those that

aid renewable energy sources. Those that support nuclear power contribute to unique environmental and safety issues, related mostly to the ‘risk’ of high-level environmental damage, rather than ongoing degradation4. Subsidies to renewable energy are generally considered, on balance, environmentally beneficial, although the full range of environmental effects of renewable energy (including those beyond the energy sector) needs to be taken into account.’

Renewable energy targets (1), EU countries have committed to 2010 indicative renewable energy targets (2). Discussions on more ambitious 2020 targets (3,4) have begun, driven to a large extent by an interest in spurring technological development, improving energy security and reducing environmental impacts (including those related to climate change). Renewable energy is forecast to be a significant component in meeting new demand (International Energy Agency — IEA, 2003). However, these targets are unlikely to be met on the basis of current policies and measures.

- (1)Nuclear power contributes positively to the environment in the areas of air pollution and climate change as it does not emit greenhouse gases or air pollutants. The question of how to safely store long-lived radioactive nuclear waste remains unresolved.

- (2)At the World Summit on Sustainable Development in Johannesburg in 2002 an agreement was reached to increase urgently and substantially the global share of renewable energy sources. A 'coalition of the willing' was formed at the summit that includes countries and regions willing to set themselves targets and timeframes for the increase of renewable energy sources in the energy mix. More than 80 countries are now members of this coalition including EU Member States.

- (3)The targets indicate a 12 % share of gross inland energy consumption (European Commission, 1997) and a 22 % share of electricity (European Parliament and Council, 2001) produced from renewable energy sources by

2010, and a 5.75 % share of biofuels in petrol and diesel for transport purposes by 2010 (European Parliament and Council, 2003).

- (4) The European Parliament called for a target of 20 % for renewable energy as a share of gross inland energy consumption by 2020 (European Parliament, 2004). The European conference for renewable energy in Berlin, January 2004 which was a preparatory conference to the international renewable energies conference in Bonn, June 2004, concluded that a 'target of at least 20 % of gross inland energy consumption by 2020 for the EU is achievable.

The production and consumption of energy places a broad range of pressures on both the natural and the built-up environment, as well as on public health. Since fossil fuels (e.g. coal, lignite, oil and natural gas) account for the bulk of energy supplies in the European Union (79 % in 2003), this section focuses mainly on environmental pressures arising from their use, namely: greenhouse gas emissions, air pollution by acidifying substances, ozone precursors and particles, and oil discharges. However, not all pollution from energy-related activities arises from the combustion of fossil fuels.

Some combustion-related emissions, such as nitrogen oxides, also arise from energy deriving from biomass, which is a renewable energy source. Moreover, while electricity production from nuclear power produces negligible emissions during normal operation, it accumulates substantial quantities of long-lived and highly radioactive waste, for which no generally acceptable disposal route has yet been developed.

Other environmental pressures from energy production and consumption include: solid waste and water contamination from mining; solid waste from coal combustion; soil damage from spills and leakages of liquid fuels. Impacts on ecosystems come from the construction and operation of large dams, mining operations and land requirements for transmission lines and power plants. Although trends in these areas

warrant monitoring, sufficient high quality data are currently often not available for robust indicators to be developed.

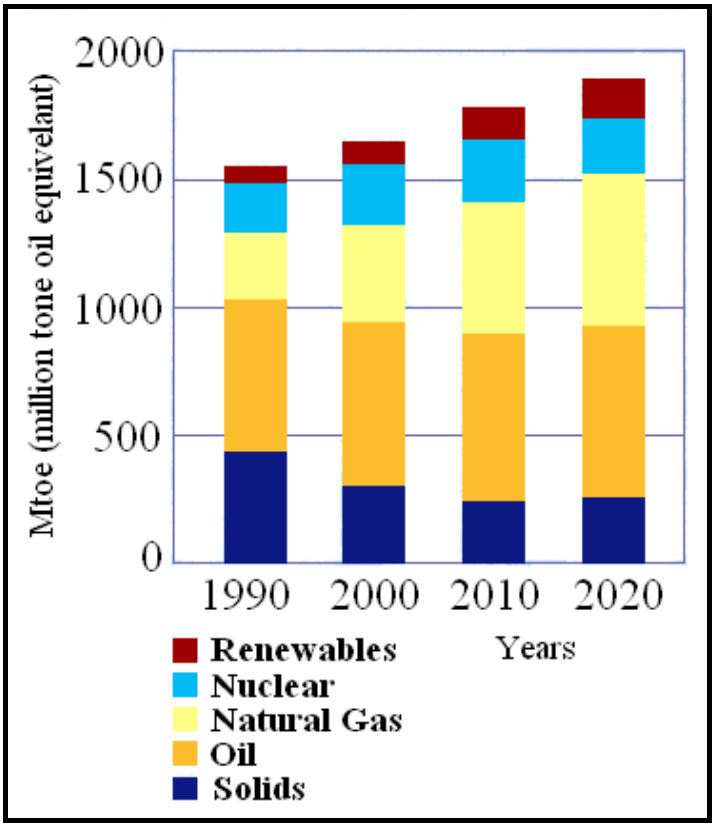

Figure 4.1 Total Energy Consumption, Projection up to 2020 (EU-25)

Energy-related greenhouse gas emissions fell by 2.6 % between 1990 and 2003, but have been rising slowly again since 1999. Further substantial decreases of energy-related greenhouse gas emissions are required in order to meet long-term emission reduction targets proposed by the EU (Figure 4.1).

The greenhouse gas emissions intensity of energy consumption in the EU-25 fell by 12.2 % between 1990 and 2003, indicating a move towards a less carbon intensive fuel mix. This decrease in emissions intensity was a major reason for the overall reduction in energy related greenhouse gas emissions in the EU and was caused largely by a decreasing share of coal in total energy consumption (down from 27.7 % to 18.2 %), with an increase in the shares of natural gas (up from 16.7 % to 23.6 %)

and to a lesser extent nuclear and renewables. However, there were wide variations between countries, with some of the highest improvements in emissions intensity seen in Lithuania, the Czech Republic and Latvia. This was mainly due to a fall in the share of heavy fuel oil in Lithuania and of coal and lignite in the Czech Republic and Latvia. In contrast, Sweden and Cyprus saw slight increases in their greenhouse emissions intensities. In the case of Sweden, a decline in the share of nuclear power contributed to the increase and in Cyprus a major cause was a rise in the use of oil, Figure 4.2).

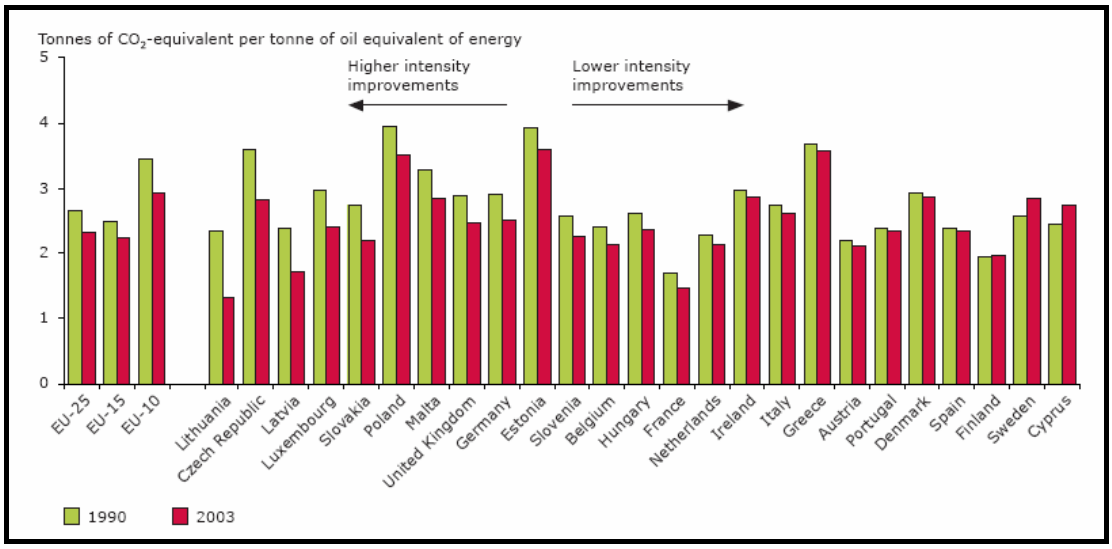

Figure 4.2 Greenhouse-gas Emissions Intensity of Energy Consumption by Country in 1990 and 2003

The intensity (i.e. in kg of emissions per tonne of oil equivalent of energy consumed) of most energy-related air pollutant emissions has declined significantly over the period 1990–2003. In particular, there has been a significant decline in the intensity of CO and SO2 emissions, which have more than halved. A main factor contributing to the decrease in CO emissions has been the introduction of catalytic converters in cars and the increased penetration of diesel cars into vehicle fleets. SO2 emissions have been reduced to a large extent in electricity generation due to the introduction of abatement technologies, such as flue gas desulphurisation, and a switching from high sulphur-containing fuels, such as coal and heavy fuel oil, to natural gas coupled with the use of coal with lower sulphur content (Figure 4.3).

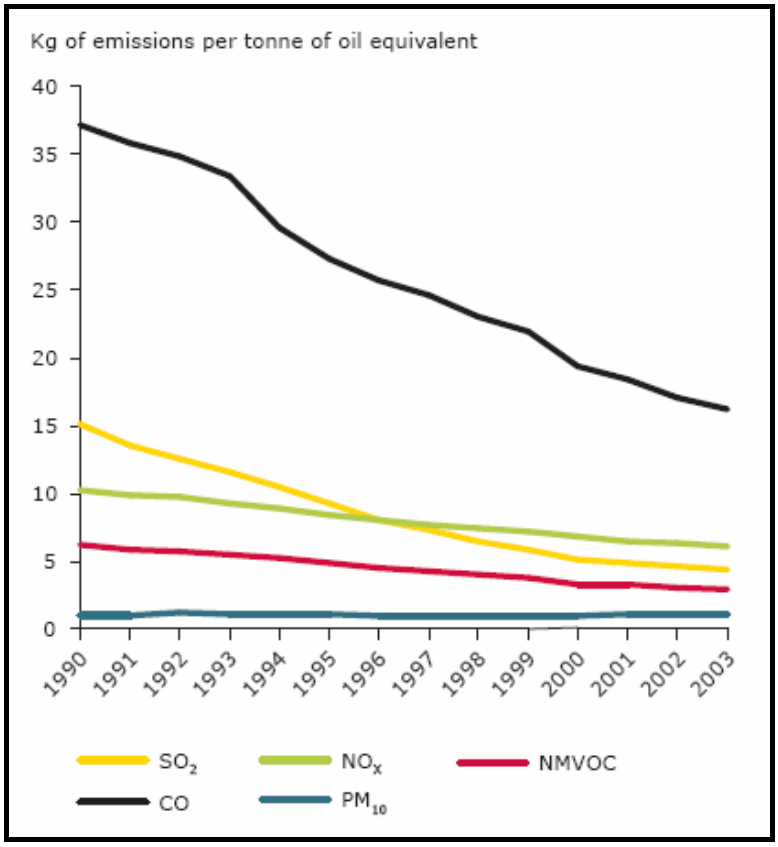

Figure 4.3 Change in the Emissions Intensity of Energy-related Air Pollutants in the E.U. - 25

Nuclear material Within the EU, nuclear material is subject to accountancy controls, physical protection, notification of shipments and protection of information related to their movements. The development and maintenance of effective measures to account for nuclear materials is Community competence under the Euratom Treaty Chapter VII, safeguards.

Safeguards, the Euratom Treaty gives the Community extensive powers to control the movements of nuclear materials within the Union, although the control is done in most case a posteriori. To foster the entry into force of the Strengthened Safeguards System, the Community and the MS have signed Additional Protocols with the IAEA that foresee a wider range of controls to 2 15 June 2004 7 ensure the absence of undeclared nuclear material and activities in nuclear or non nuclear facilities suspected of engaging in activities which could potentially involve the manufacturing of components (whether nuclear material or otherwise) for nuclear weapons. Under the Safeguards Agreement (INFCIRC 193) between EURATOM,

the EU Non Nuclear Weapons States and the IAEA, the Commission collects all nuclear material accountancy information from the EU installations and submits them in a consolidated form to the IAEA. The Commission and the IAEA perform, in co-operation, Safeguards Inspections in the EU, following the arrangement between the Commission and the IAEA.

As of the 30 April 2004, the Additional Protocol to the Safeguards Agreement with the IAEA applies to the MS and the Community. Safeguards are now applied following also INFCIRC 540. Similar Agreements exist between the Community, the IAEA, and France and the UK respectively. In these States all civil nuclear material is subject to Euratom Safeguards and the Commission performs relevant inspections. The IAEA however only inspects selected facilities on the basis of so called voluntary offers.

Sealed sources, the Directive on sealed sources requires MS to control the movements of high activity sources. On 22 December 2003, the European Council adopted a Directive on the control of high activity sealed radioactive sources (Council Directive 2003/122/EURATOM). EU Member States have until 31 December 2005 to transpose the Directive into their national legislation. The purpose of this Directive is to prevent exposure to ionising radiation arising from inadequate control of high activity sealed radioactive sources and to harmonise controls in place in the Member States by setting out specific requirements ensuring that each such source is kept under control.

The obligations resulting from this Directive supplement those set out in Directive 96/29/EURATOM. According to the Directive, Member States shall require prior authorisation for any practice involving a high activity source and shall ensure that, before issuing an authorisation, arrangements have been made for the safe management of high activity sources. In particular, financial provision should be made for the safe management of high activity sources when they become disused sources. Requirements on tracking, identification and marking of sources, and

training of users are also regulated. Specific mention is made of orphan sources for which special attention is required by the competent authorities.

Transport, the shipment directive 92/3 EURATOM provides for the prior notification and approval in case of shipments of radioactive waste and spent fuel (if declared waste) between MS and in case of imports into or exports out of the Community. A proposal to amend Council Directive 92/3/Euratom on the supervision and control of shipments of radioactive waste between Member States and into and out of the Community is being prepared. Article 77 (b) of the EURATOM Treaty also assigns to the Commission the responsibility to assure that agreements concluded by the Community with third states or international organisations are complied with. Under the Co-operation agreements with the USA, Australia and Canada mechanisms have been installed for notification and approval by prior consent of nuclear material transfers between the EU and those States.

4.3 Production, Employment and Productivity of Labor in Coal Mines of E.U.

When the ECSC Treaty was signed in 1951 the reconstruction of Europe required considerable quantities of energy products. Demand far outstripped supply and the fear of shortage dominated policy in this sector. The High Authority of the ECSC thus encouraged greater production through the creation of new mines and the conclusion of long term supply contracts.

Since the 1960's however the coal mining industry has gone into rapid decline due to competition from coal outside the Community and the advent of other fuels to produce electricity and heat. Following successive phases of restructuring of the coal industry, coal production in the EU of 15 Member States dropped from around 600 million tons in the early 1960s to less than 86 million tons in 2000. As the production of coal on the basis of economic criteria has hardly any prospect either in the EU or in the applicant countries, it can only be maintained within the framework of the European Union's security of supply, which after the expiration of the ECSC Treaty in July 2002, will not become easier.

Mine, the activities included within the concept "mine" used for calculating mines' consumption, employment and productivity embody all operations connected with the getting, raising, handling, preparation and transport of coal from the face or the production pits, up to and including the point of dispatch to third parties or ancillary activities. Also included are those activities necessary for maintaining the environment of the mine, such as ventilation and pumping; activities necessary for the maintenance and improvement of the fabric of the mine activities necessary for the maintenance and repair of the equipment connected with the operations of the mine as delimited in the first sentence, provided that such maintenance and repair takes place at the site of the mine; and operations connected with the disposal of waste products from mining operations.

Ancillary activities, such as coke ovens, patent fuel plants and brickworks are excluded since they do not come within the concept of the operations of the mine as defined above. Power plants supplying power and light principally to the mine are included in the mine, but power plants supplying electric energy mainly to ancillary activities or for external sale are considered ancillary activities. Workshops located at the site of the mine and serving the mining operations are included in the mine, but centralized workshops serving groups of mines and organized as a separate enterprise are excluded. Colliery stores (warehouses and stockyards) located at the mine and containing materials for use in the mine are included in the mine, but centralized stores serving groups of mines or ancillary activities and organized as a separate enterprise are excluded.

All coal preparation plants are part of mining activities whether located at the mine or centralized and serving several mines. Surface transport (railways, lorries, conveyors, aerial ropeways, etc.) handling coal before it is loaded and ready for dispatch to third parties, or moving mining waste to spoil heaps and disposing of it there, or transporting coal to a centralized coal preparation plant for cleaning are all part of the mine. Surface transport handling coal after it is prepared and ready for dispatch to third parties, such as moving the prepared coal to shipping wharves rail loadouts or centralized landsale depots are not part of the mine. Surface mobile plant

(fork-lift trucks, cranes, etc.) working within a colliery stockyard or moving materials from stockyard to shaft top, drift adit or surface production pits are part of the mine activity, but transport bringing materials from external suppliers to the mine stockyard are not. In general, the following installations and activities are included in the concept of the mine all underground workings; winding facilities; mine ventilation; pumping stations, whether at the mine or not, engaged primarily in draining pits; lamprooms; pithead baths; colliery stores and workshops associated with the day-to-day running of the pit; handling equipment and facilities (e.g. equipment for loading, unloading, stowing, etc. of coal or waste or colliery materials); all coal preparation facilities; surface transport serving the mine; steam or electricity generating plant at collieries whose output is mainly used by the mine; repair and improvement of the mine structure and facilities; colliery offices; maintenance, heating and cleaning of colliery plant and offices; safety services (first aid rooms, rescue stations); and security services (watchmen, etc.).

Welfare services such as canteens, shops and supermarkets at collieries, maintenance of mine workers dwellings, sports and recreational facilities, and medical clinics are not part of the mine, although a first-aid room for immediate treatment of injuries is considered as part of the mine.

Workers at mines (men on colliery books), all personnel who are engaged in mines' activities as defined above, but excluding those persons performing solely clerical or administrative duties. In principle, the apprentices are included if they contribute to the activities of the mine but excluded if they are at separate training centres or technical colleges full-time. Supervisory staff and officials are included, other than those in charge of staff engaged on purely clerical or administrative duties. Contractors' men engaged on operations of the mine are included. All workers on the books of the mine are included, whether full-time or part-time workers. Persons who have not reported for work for more than six months as a result of protracted illness, military service or other reasons are not included.

Workers are those employees engaged in the implementation of the production processes or who provide auxiliary services to the production processes, such as maintenance work or craft tradesmen. In contrast, the non-manual workers excluded from these data are those employees engaged more with the paper-work rather than the manual work and comprise managers, scientific staff (including laboratory staff) technical staff (such as engineers and surveyors), commercial staff (accounting, sales, etc.), administrative staff (e.g. personnel officers), office staff (clerks, timekeepers, typists) and computer staff.

Average annual number of workers is generally calculated from the numbers at the end of months (or 53 weeks), starting with the number at the end of the last month (or the last week) of the year proceeding the year under review.

A manshift is the normal period of attendance at the mine of one working day. The duration of a shift varies both between and within countries according to the labor arrangements and regulation in force. The figures of shifts comprise all shifts worked by workers on books, defined in terms of normal shifts, overtime being expressed "pro rata" in terms of normal shifts based on the overtime hours actually worked, not those paid for.

Recovery of coal from dumps, comprises the recovery of hard coal from spoil heaps and the dredging of slurry from old settling ponds. (Slurries from the preparation process of currently produced coal from deep mines are included in output results provided they are sold or used at the mine).

Small mines are those which are not significant in the coal economy and where the effort in collecting the data is out of all proportion with the effect on overall results. (Example: in the United Kingdom they consist solely of those hard coal mines where less than 30 men are employed underground). Both output and manshifts are excluded.

Work on capital investment projects - covers activities over and above those required for maintaining existing production activities. The activities excluded as capital investment work include the sinking and deepening of shafts and staple shafts and the drivage of drifts from the surface to the coal deposits. In surface mines, the activities exclude development of new roadways and site work for positioning large scale production equipment prior to their actual commencement of mining. These activities are capital investment work whether they are accessing fresh reserves or not, for example, if they are providing a second or subsidiary means of access for men, or opening new surface production pits. Apart from sinking shafts, driving surface drifts, and developing new surface production sites, other capital investment work which is excluded from productivity calculations consists only of the drivage of new main underground or surface roadways to access fresh reserves of coal in order to increase capacity.

Both the manshifts worked on capital investment projects and any coals produced from such operations are excluded when calculating productivity. When once the new main roadways have been driven providing access to a virgin area of coal, then any subsequent driving of gate roads (for a retreating face, for example), or making cross cuts to establish the face line, or the equipping of a newly established face, or the drivage of roadway sections along with or in advance of the movement of an advancing face are all part of the normal production operations and are included in the productivity calculations. In surface mines, the extension of roads and other conveyance systems to allow for the continued operation of a production pit are also part of the normal production operations and are included in the productivity calculations.

The productivity calculation relates to all workers of the mine (defined above) regularly working, whether employed directly by the colliery or by an outside contractor. Account is also taken of any time spent underground or at surface production pits by workers normally employed in nonproduction activities. It includes the work of supervisory staff, and trainees if their efforts contribute to the regular mining operations.

4.4 Waste Management

At the European Union scale, no specific legislation exists today on waste from mining operations, neither the extraction of industrial materials, the processing of ores or industrial materials (Figure 4.4). Each of the member States has its own mining and environmental legislation which more or less completely and sometimes separately covers the different branches.

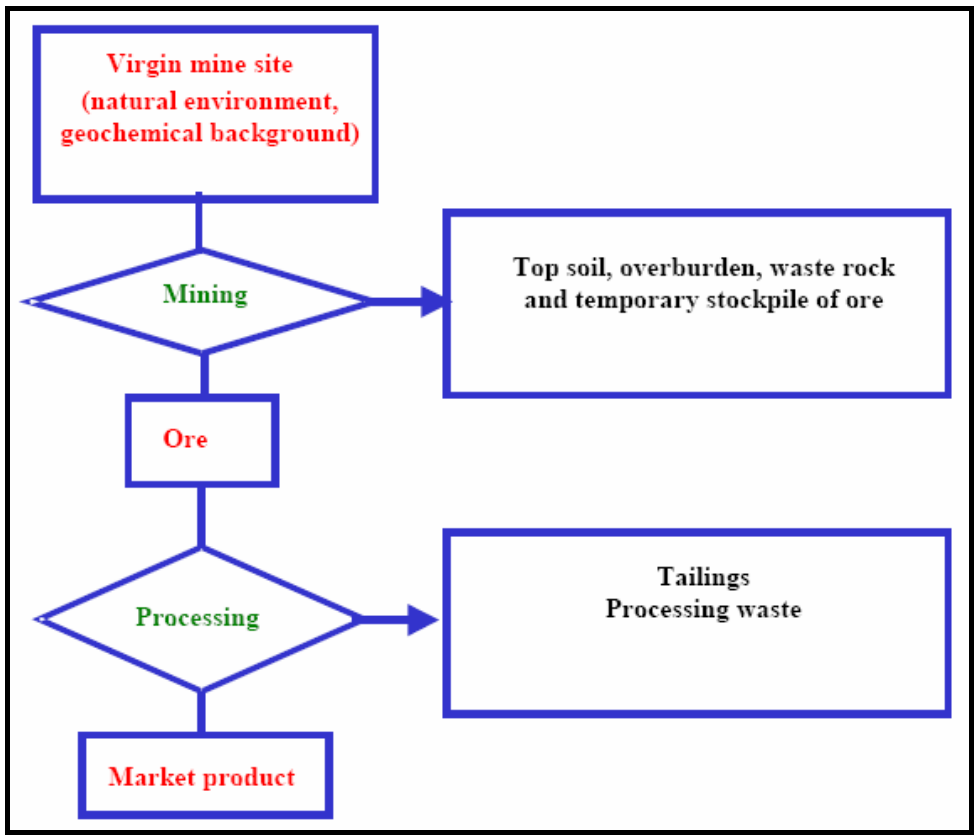

Figure 4.4 Mining Waste Types

European legislation distinguishes between horizontal legislation relative to environmental management and legislation by specific sectors, products or types of emission (Air, water, and waste). The horizontal legislation concerns the environment management: the collection and assessment of the information on the environment and on the impact of a large number of human activities. The vertical legislation concerns the specific sectors.

Figure 4.5. shows how meteoric precipitation can transfer pollutant from a tailings dam or a processing plant to the river if the waste management is not efficient. If there is no impermeable layer, below the deposit, the infiltration of meteoric precipitation through deposit can transfer the pollutant(s) to the river via groundwater flow. The extraction process can itself modify the water flow and accelerate this transfer. Infiltration can also occur below a decantation basin (Charbonnier, 2001).

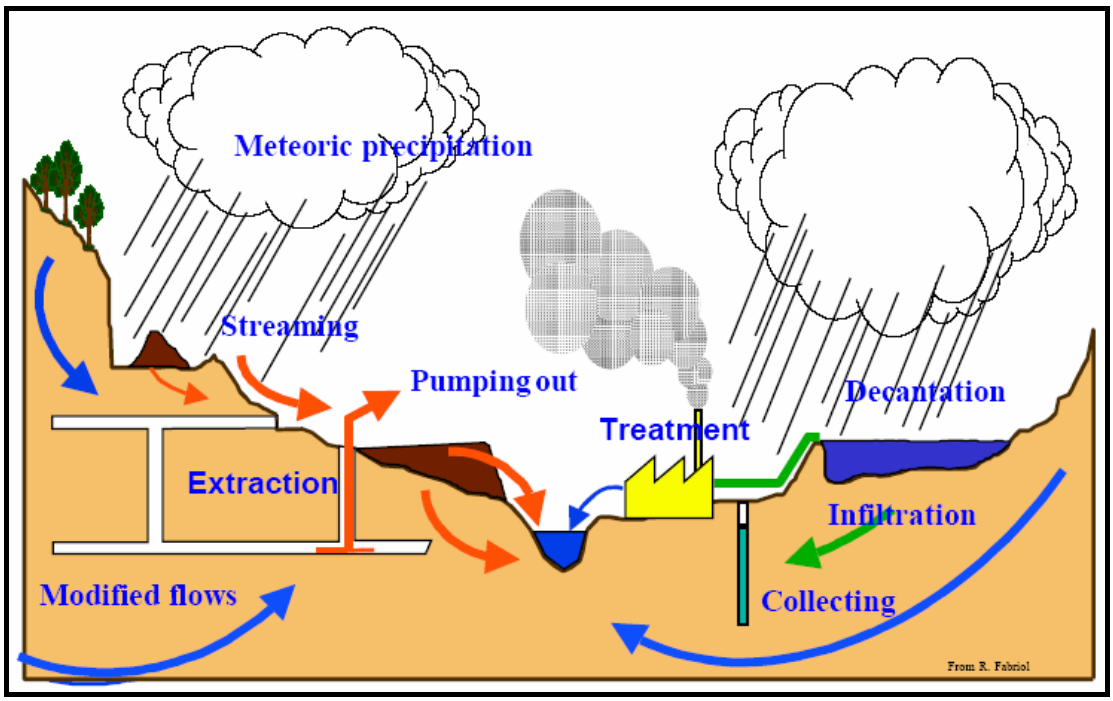

Figure 4.5 Pollutant Transfer

The major risks linked to mining waste for the environment are two fold:

• Risks associated with not only potential pollutant source (*e.g.* acidity and heavy metals in non-ferrous metallic ore) but also the specific environmental context and the presence of targets in the event of liberation. The possible risks from the potential pollutant source (such as acidity and heavy metals) in waste is dependent not only on the mineral characterisation of the solid but also on the quality of the potential leachates, the direct environment (soil, groundwater, surface water, air) and the potential targets (human, fauna and flora). The realisation of a Geographic Information System (GIS) specific to mining waste quantities and their pollution

potential in different environmental contexts would thus constitute a tool in the assessment of risks linked of such materials. At the moment, such systems are used by some regional governments for the information management on land planning. The risk management with a GIS system in mining requires a considerable collection of specific data and additional series of external analyses. This system should be well defined and studied before to be developed. Then, results can be visualised successfully in the GIS system.

• Risks associated with the stability of the tailings dam, as indicated by the recent spectacular accidents in Spain (Aznalcollar) and Romania (Baia Mare). As regards the potential risk from tailings dams, it will be necessary to evaluate on each site the stability of tailings dam. Particular parameters such as exceptional climatological conditions should be carefully taken into consideration during the evaluation. In addition, common minimum safety standards for the design, construction, operation and monitoring should be developed and applied. These minimum safety standards could be built on the know-how of the profession.

Mines in all European Union countries are governed by a set of laws, generally combined in a Mining Code. The numerous regulatory texts, laws and standards, reveal that mines are a matter of concern to the national administrations. Mining waste is governed by general waste laws and texts. The extent, to which environmental concerns are addressed in these national laws, varies from Member States to Member States. According to the contract's tasks, this report refers superficially to some technical processes, the amounts and types of wastes as well as a short description of the national legislation of the various Member States. According to the returned questionnaires, a distinction can be made between the following three types of mine and related generated waste:

• Abandoned/old mines,

• Operating mines based substantially on old operating methods,

• Operating mines based on new design

For abandoned mines, it is important:

• to undertake site monitoring (including land form(s), geology, soil type(s), Hydrogeology, flora and fauna, land use, heritage, overburden and waste characterisation, recycling potential, etc.) to obtain a clear picture of the situation;

• To establish treatment objectives according to required future land use (for example, pollutant level in soil after treatment to be fixed depending on the proposed land use).

For operating mines based substantially on old operating methods, it is essential to evaluate the control routine as regards pollution risks and the stability of the tailings dams, and to take all necessary measures to limit risks (for example, installing leachate collection tanks, etc.). Substantial changes in the operation and monitoring phases are likely to be necessary to ensure a sufficient level of environmental protection.

For operating mines based on new design, it should be evaluated whether these installations as well as their control routine are sufficient to prevent risks of pollution or accident. Additional measures could be considered if necessary.

The performance of old and new installations in terms of emissions and discharges have to be evaluated in order to see if differences in methods have an impact. All management of mining waste disposal facilities must taken into consideration long term environmental issues, because these structures will more than likely survive both the mine and the mining company. This raises a legal problem as regards the responsibility for maintenance and repair of these facilities since liability, under most laws, cannot be endless. Even where the facility becomes a permanent structure, it is still necessary to fit the site with a permanent analytical and inspection system. Closure and after care operations are therefore of paramount importance to lower, as far as possible, the long term environmental risks.

Research and development programs should continue around sets of themes specific to the various methods of mining-waste management. Today's decisions and future research and development must be based on current knowledge (for example results from foreign countries) but detailed further knowledge should be developed on:

• The reactivity of specific mining waste; this could be approached in different ways such as leaching tests, long-term column tests and normalised tests as being developed in the context of the Landfill Directive. Even if there are no international standard, there exist a number of normalised test protocols for static and kinetic tests of acid drainage potential, which is a key characteristic with regards to waste originating from sulphidic minerals,

• The behaviour of metallic molecules (originating from mining waste) in the subjacent geologic layers and prediction of their fate using tools such as geochemical and solute-transport modelling, their behaviour within the waste deposit is also important (adsorption and other attenuation processes),

• The discrimination between geochemical background and mine-impacted soils and waters,

• The long term stability of dams,

• The improvement of recycling practice related to the characteristics of mining waste,

• The potential risks raised by certain covering techniques of tailing ponds (e.g. water cover),
• The process management and protection measures during operation and their subsequent impact on the closure phase.

No European regulation exists today that applies specifically to close mines and closure procedures. However, since the mine sites can be identified under cover of

the Landfill Directive, Articles No.12 and 13 of this Directive (1999/31/EEC) specifies the closure conditions of this type of site. Existing operations, as far as they are covered by the Landfill Directive, have to comply with the Landfill Directive after the closure of the mine. Proper closure and remediation procedures should be applied for mining waste disposal sites.

Old mining sites can be taken into account within the framework defined by the work groups CARACAS (concerted action on risk assessment on contaminated sites) or CLARINET (Contaminated lands and risk assessment network on European technologies).

CHAPTER FIVE

NEW REGULATIONS ON TURKISH MINING INDUSTRY AND THEIR EFFECT

5.1 Waste Management

In order to begin to transpose and implement acquis related to waste management, a short term priority in the Accession Partnership Document, and to complete the transposition of the acquis and strengthen the institutional, administrative, and monitoring capacity to ensure environmental protection including data collection, a medium term priority, increasing the effectiveness of waste management is designated as a priority.

Although existing Turkish legislation is to a large extent harmonized with relevant EU legislation, studies have been initiated to prepare draft regulations and proposals for amendments in order to fully complete alignment with the EU directives listed below.

Turkey's major problems related to waste management are the elimination of hazardous waste from industry, and the combination of industrial and domestic waste, domestic waste, specific waste, and construction waste all together, without separate collection.

However, in the framework of regulations prepared by the Ministry of Environment and Forestry, the metropoles in particular have initiated integrated solid waste management studies, and collection and elimination of waste following categorization is being realized to a certain extent. In Turkey, there are plants for the elimination of hazardous and domestic waste, albeit few in number.

A project proposal has been submitted to the 2003 Pre-accession Financial Assistance Program to create the necessary capacity in the Ministry of Environment and Forestry for the implementation of legislation and harmonization of Turkish legislation with European Parliament and Council Directive on packaging and packaging waste, Council Directive on waste, Council Directive of 12 December 1991 on hazardous waste, Directive of the European Parliament and of the Council of 4 December 2000 on the incineration of waste, Council Directive on the landfill of waste, and Council Regulation on the supervision and control of shipments of waste within, into and out of the European Community.

5.2 Safety

Since 1994, Eurostat has produced annual European statistics on accidents at work, applying a harmonized methodology based on national sources mainly of an administrative nature. This publication covers the results for 1996. In addition to information on the victims, their injuries and their economic activities, the 1996 data cover two new aspects: the size of the enterprise, including information on the victim's professional status, and the duration of absence from work resulting from the accident, which is a prime indicator of its cost.

Furthermore, for the first time, the 1996 data include information on "commuting accidents" occurring on the journey between home and the place of work. In 1996 in the European Union (EU), there were 4 757 611 accidents at work resulting in more than three days' absence from work, compared to 4 918 066 in 1994 (estimated numbers): this represents a downward trend from 1994 to 1996 of 3.3% (Eurostat, 2000).

These results relate to 88% of persons in employment in the EU, i.e. 131.5 million workers. Related to this population, the number of accidents resulting in more than three days' absence per 100 000 persons in employment (incidence rate) in all of the nine main branches of agriculture, industry, energy, construction, trade, transport and business activities fell from 4 539 in 1994 to 4 229 in 1996 - a decrease of approximately 7%.

The decrease in fatal accidents at work was even greater, with numbers falling from 6 423 in 1994 to 5 549 in 1996 in the EU and their incidence rate from 6.1 to 5.3 per 100 000, i.e. a fall of slightly more than 13%. The risk of having an accident at work was higher for workers in local units of companies with fewer than 50 employees and for the self-employed: their incidence rate of fatal accidents was at least 6.3. For accidents resulting in more than three days' absence, the incidence rate exceeded 5 000 for local units with 10 to 49 employees. In addition to the major impact of these accidents in human terms, they also had a high socio-economic cost: whereas for 47% of accidents the resulting absence from work was more than three days but less than two weeks, for 48% the absence was between two weeks and three months; for the remaining 5% of accidents, the consequence was an absence of three months or more, or permanent partial or total disability. It is estimated that 146 million work days were lost in 1996 in the EU and Norway owing to accidents at work resulting in more than three days' absence (4 832 329 accidents including Norway), i.e. a mean of 30 days per accident and the equivalent of one day of work lost per year for every person in employment.

Finally, it is possible from the information on commuting accidents from nine Member States to estimate the number of accidents resulting in more than three days' absence throughout the EU at approximately 600 000 in 1996 (in addition to accidents at work). The incidence rate was 489 per 100 000 (nine main branches). The number of fatal commuting accidents, which were chiefly road traffic and transport accidents, was around 2 900 for the entire EU, which makes an incidence rate of 2.9. In addition to this, there were 1 847 fatal accidents at work (a third of the total of 5 549) in the branch of transport and communication or, in the other main branches, caused by road traffic accidents or accidents on means of transport during work, giving an overall total of more than 4 700 for deaths of this type linked to work in 1996.

All companies in mining activities should be encouraged to achieve the highest standard of occupational health and safety for all who work in the sector. With regard to health and safety regulations.

Companies shall provide good, safe and healthy working conditions, taking such protection measures as necessary. Companies shall identify potential risks associated with mining and shall adopt suitable preventive measures to remove or reduce such risks.

The European mining industry is committed to continuously improve its heath and safety record and in many cases goes beyond legal compliance in the management and measures taken. This should be set an example for mining industry in Turkey.

All companies will have to keep track of followings for the benefit of companies, employees and third parties;

- Sickness absence;
- New cases and total number of cases of occupational disease, ill-health, and injury.
- Ill-health retirements;
- Deaths resulting from work activity;
- Compensation work claims, litigation against company;
- Production stoppage due to accident or illness,
- Cost to industry.

Among the activities with a high risk of accidents at work, there was a noticeable decrease in the food and beverages industry (incidence rate of accidents resulting in absence from work of 6 557 in 1996, i.e. 10.9% down on 1994, and rate of fatal accidents of 4.7, i.e. a drop of almost a half), in the construction (rates of 8 023 and 13.3 respectively, i.e. down 11.0% and 9.5%) and auxiliary transport services (10 526, down 9.1%, and 10.0, down 2.9%, although the drop relative to 1995 was 27.5%).

By contrast, the incidence rate of accidents resulting in more than three days' absence from work rose for a second group of high-risk activities: agriculture (6 771, up 4.2%), the wood industry, which had the highest incidence rate of accidents

resulting in an absence from work (10 793, up 5.4% on 1995), the glass, ceramics and construction products industry (6 533, up 0.2%) and land transport (6 000, up 4.7%). In the basic metals and fabricated metal products sector, the rate of deaths increased (7.7 or 24.2%) (Figure 5.1).

Figure 5.1 Activities with High Risk of Accidents at Work (E.U.25)

In other activities, there was a marked decrease for hotels and restaurants (3 532 and 1.1, down 14.3% and 42.1%), air transport (4 121 and 5.7, down 24.7% and 27.8%) and financial intermediation, real estate, renting and business activities (1.6 for deaths, a drop of 27.3%). Finally, for the electricity, gas and water supply, which is a new common branch, the incidence rate of accidents resulting in absence from work was low in 1996 (1 619), but that of fatal accidents was higher than the mean (5.7) (Figure 5.1).

For the EU in 1996, the incidence rate of accidents at work resulting in more than 3 days' absence went from 5 751 for the 18-24 age group to 3 558 for the 45-54 group, rising again to 4 063 for those aged 55-64 (9 common branches). The same applied in the euro-zone, although the incidence rates here were higher: from 7 101 for the 18-24 groups to 4 155 for the 45-54 groups, then up to 4 898 for those aged 55-64 (a mean of 4 966). This rise in incidence rate after 55 years was not and Finland. In Greece and Ireland, the incidence rate tended to rise with age in general; in Sweden, it remained stable throughout all age groups (except 55-64 years). However, the incidence of fatal accidents in the EU in 1996 showed a continuous rising trend with age, from 3.8 for the 18-24 age groups (4.9 in the euro zone) to 8.7 for the 55-64 age groups (10.6). This increase occurred in all countries, despite variations in the intermediate age groups.

In the EU in 1996, the incidence rate of fatal accidents to employees and their employers was highest for small local units of enterprise (see definition on page 7) with fewer than 50 employees: 6.8 for those with 1 to 9 employees and 6.3 for those with 10 to 49 employees. By contrast, the incidence for large local units of 250 or more employees was less than half of the average, at 2.7. For accidents resulting in more than 3 days' absence, the picture was similar, but only for units of 10 to 49 employees: 5 195 per 100 000 in the EU and Norway. For 1 to 9 employees, the incidence was only slightly above the mean (4 241) and only 30% lower than that for units of over 249 employees (2 943). However, this overall breakdown needs to be examined in the future in more detail by economic activity (Figure 5.2).

Figure 5.2 Risk of Accidents at work depending on the size of the local unit of the enterprise

5.3 Education

A key role to good health and safety management is to educate management and employees about their health and safety responsibilities, and about the prevention and control of workplace hazards. Advice on occupational health, safety, hygiene and ergonomics and on individual and collective protective equipment are frequently required and given. Most mining companies have regular training for their staff to ensure that the objectives can be achieved.

Regarding regular training in mining industry in Turkey , as we all may know there is less training and education has been done. With new regulations this issue can be addressed.

Schooling rates in Turkey in the academic year 2003-2004 reached 12.5% for preschool, 96.1% for primary education, 96.1% secondary education with 30.3% in vocational technical education and 66.1% general high school, and 36.8% in higher education.

Table 5.1 Number of Students and Schooling Rates by Education Stages (Progress Report, 2005)

	2001-2002		2002-2003		2003-2004	
	Number of Students (000)	Schooling Rate (%)	Number of Students (000)	Schooling Rate (%)	Number of Students (000)	Schooling Rate (%)
Pre-school education[1]	**256**	**9,1**	**320**	**11,2**	**358**	**12,5**
Primary education	**10 531**	**99,9**	**10 332**	**96,4**	**10 480**	**96,1**
Secondary education	**2 808**	**73,8**	**3 035**	**81**	**3 593**	**96,4**
a) General High School	1 909	50,2	2 054	54,8	2 464	66,1
b) Vocational&Tech Education	899	23,6	981	26,2	1 129	30,3
Higher Education[2]	**1 664**	**30,8**	**1 894**	**35,4**	**1 946**	**36,8**
- Formal Education[3]	1 142	21,1	1 232	23	1 294	24,5
- Distance Education	522	9,7	662	12,4	652	12,3
Adult Education	**3 211**	-	**3 039**	-	**2 879**	-

The direct positive impact of increasing the quality of human resources capacity in Turkey on the investment environment in the country requires that serious measures should be taken in this field. Accordingly, the Ministry of National Education which is responsible for education policy of the country takes on one hand various measures and aims to increase the quality of education infrastructure, and on the other, plans to meet at international standards the education needs of the population which is increasing by 2% annually.

Despite limited budgetary means in Turkey, increase in recent years in resources allocated to education is a good indicator of importance accorded to education. The amount reserved to the Ministry of National Education from the general budget was increased by 31.4% in 2003 compared to the previous year, and by 26.3% in 2004. The share that the Ministry receives from the consolidated budget was 6.91% in 2003, and increased to 8.54% in 2004. The share of the Ministry from the budget constituted 2.85% of the GDP in 2003 and 3.06% of the GDP in 2004. Education has become in 2004 for the first time the highest share from the budget.

With resources of the general budget and provincial special administrations in 2004, 1.642 education buildings and 18.253 classrooms were completed and an additional capacity for 536.200 students was provided. In addition to that, as a result of the legislation providing tax allowance that went into effect on April 24th, 200317 protocols were signed for construction of 404 new schools and 188 annex buildings for a total of 7.027 classrooms, repairs of 149 schools and equipment for 1999 schools and provision of 191 thousand m2 land.

Works are underway for a structure in which the education period in secondary schools is increased to 4 years, types and load of lessons are reduced, the 9th grade is arranged as common general culture lessons in general and vocational secondary education, students are allowed to switch vertically and horizontally between programs, modular based education is installed in vocational education on the basis of broad vocational fields and specialization shall be given in later education stages.

Works on setting the compulsory education duration at 12 years in accordance with the EU and OECD norms are being conducted diligently. As of the 2003-2004 period, the number of institutions for tertiary education has increased in a limited way. The number of universities went up to 77 from 76, with 53 being state universities, and faculties from 551 to 573 and vocational colleges from 446 to 469, institutes from 207 to 215 and no changes in the number of colleges that is 175.

In the academic year 2003-2004, the number of professors went up by 5.27% with respect to the previous period and reached 29.075, and the number of instructors went up by 3.95% to 77.065. On the other hand, the total number of students went up by 2.76% to 1.946.442 and the number of formal students went up by 5.02% to 1.294.172. In this context, the number of students in formal education per professor went down to 44.5, and the number of students in formal education per instructor went down to 16.8 which brought about a limited improvement.

In accordance with the goal of training qualified intermediate labor and raising the share of vocational training in higher education to 30%, a quota of 193.504

students were given to vocational colleges in the academic year 2004-2005 within the transition without examination and at the first stage 115.422 students were placed.

CHAPTER SIX

CONCLUSION

As regards Turkey's progress towards E.U, in some areas some progress can be said here as:

Security of mining licenses. The new legislation outlines very clearly the terms and conditions for obtaining, keeping and losing a mining license. This is a very important improvement on the former status.

Single authority. The legislation appoints a single government agency to obtain and maintain licences, rather than needing to apply to a number of agencies as the case had been in the past.

Access to land. The access to areas where it will be possible to carry out mining has been improved.

There has been significant progress in streamlining procedures for the mining sector. By a legal amendment on June 5th, 2004, the pre-license requirement in the mining sector was abolished to reduce red tape. To provide additional investment incentives, the amount of taxation on mining productions that come from entrepreneurs in the sector domestically, using their own facilities, and creating value added, was reduced by 50%. This amendment also provides that permission procedures in the mining sector shall be concluded within three months. Secondary legislative works on the topic are underway.

The time required to obtain an Environmental Impact Assessment (EIA) Report has been brought down to 33 days from the earlier 6-7 months, provided that all the materials required we submitted with the application. This measure has significant impact for especially mining, petroleum sectors and also tourism sector.

Legislation to improve the procedures for start-up permits has been drafted. The draft law aims to create a “one-stop-shop” structure for permits to be issued by local authorities. The new system will make procedures of all necessary permissions and approvals easier by enabling investors to complete procedures from a single local authority, in a predetermined time period.

By an amendment on June 8th, 2004 to the Pasture Law, actions were simplified relating to allocating pastures, summer and winter camps, grasslands and pasture lands for mining and petroleum prospecting activities by changing their allocation purpose. Conditions for allocating the pasture lands to mine and petroleum prospecting activities were made more flexible and the procedures and principles to be observed during the allocation process would be laid out in a regulation. The legislation aims to reduce red tape and accelerate the allocation process by delegating the authorities and responsibilities to local units. In the context of this legislation, preparations of regulations are underway on conduct of search and operating activities pursuant to the Mining Law and the Petroleum Law.

Regarding nuclear energy, Turkey's capacity to fulfill acquit requirements is fairly advanced. Turkey has no nuclear power generation plants yet, but has announced plans to promote the construction of a capacity of 5000 MW by 2020. The independence of the Turkish Atomic Energy Authority (TAEK) needs attention. Supervisory responsibilities are not separated from research and the promotion of nuclear energy.

Turkey has reached a considerable degree of alignment as regards nuclear safety and radiation protection. No new implementing regulation has been enacted. Substantial upgrading of existing facilities will be needed, including radioactive waste management and storage facilities. Turkey has not acceded to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, to which Euratom became a contracting party in January 2006.

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