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The Environment Sector in Turkey

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İTALYA CUMHURİYETİ BÜYÜKELÇİLİĞİ
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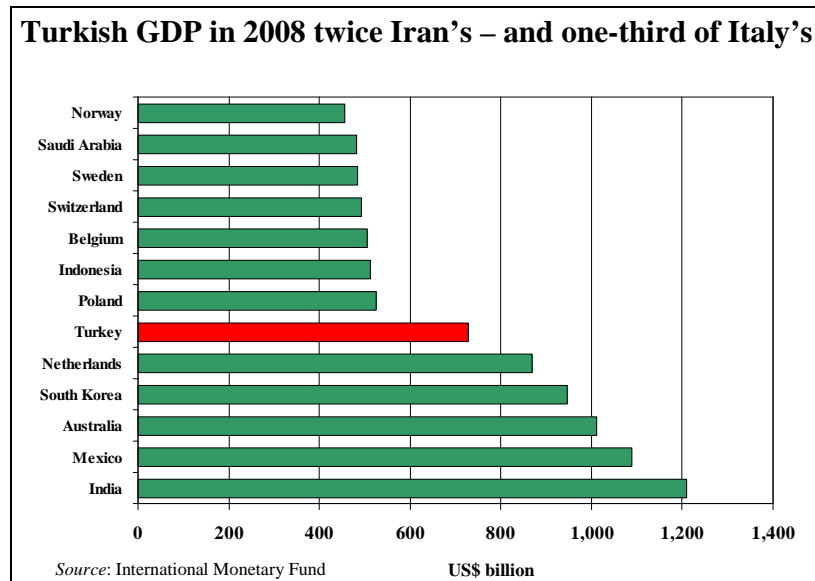
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LIST OF ABBREVIATIONS

ASKI	Ankara Water & Sewerage Administration
CO	Carbon monoxide
CO ₂	Carbon dioxide
DSI	State Hydraulic Works
DTM	Undersecretariat of Foreign Trade
EIA	Environmental Impact Assessment
EU	European Union
EUSG	Secretariat General for European Union Affairs
EC	European Commission
GDP	Gross Domestic Product
GHG	Greenhouse gas(es)
GMO	Genetically modified organism
GNP	Gross National Product
HPC	High Planning Council
ISKI	Istanbul Water & Sewerage Administration
IZSU	Izmir Water & Sewerage Administration
MENR	Ministry of Energy and Natural Resources
MoEF	Ministry of Environment and Forestry
MoH	Ministry of Health
PM	Particulate matter
PM ₁₀	Particulate matter ≤10 micrometres in diameter
PMUE	Prime Ministry Undersecretariat for Environment
PPP	Purchasing Power Parity
Petder	Association of Petroleum Product Distributors
REC	Regional Environmental Centre
SEE	State Economic Enterprises
SEPC	Special Environmental Prevention Committee
SME	Small and Medium Size Enterprises
SPO	State Planning Organization
Tg	Teragram
Turkstat	Turkish Statistical Institute
Turkak	Turkish Accreditation Agency
UCES	National Environmental Approximation Strategy (2006)

I ECONOMIC OVERVIEW

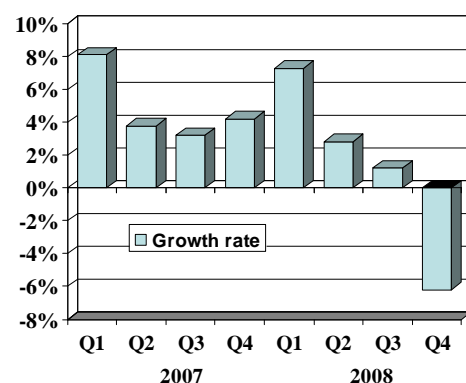
As of 2008, Turkey was the 17th largest economy in the world according to the International Monetary Fund, being significantly larger than Poland and Indonesia, and coming behind the Netherlands and South Korea. Its GDP on a nominal basis was \$729 billion. The IMF estimates that per capita GDP of Turkey was \$13,138 at current prices on a purchasing power parity basis, above the figures for Bulgaria and Romania.



In the past three decades, GDP has grown at a compound rate of 4.3%, but growth has been uneven. The financial crisis of 2001 led to a fall of 6.8% in GDP. A revival began in early 2002, and, according to the new GDP series, between 2002 and 2006 growth resumed at an impressive cumulative average rate of 7.2% - 6.2% in 2002, 5.3% in 2003, 9.4% in 2004, 8.4% in 2005, 6.9% in 2006 and 4.5% in 2007. The annual rate of growth in GDP in the second quarter of 2008 fell to 2.3% and in the third quarter to 0.5%, before a 6.2% fall in the fourth quarter.

In April 2009, the Government had sharply to reduce its short-term growth forecast. It currently expects the economy to shrink by 3.6% in 2009 but then - albeit slowly - to resume growth with 3.3% in 2010 and 4.5% in 2011.

2007-08: Following world into slump

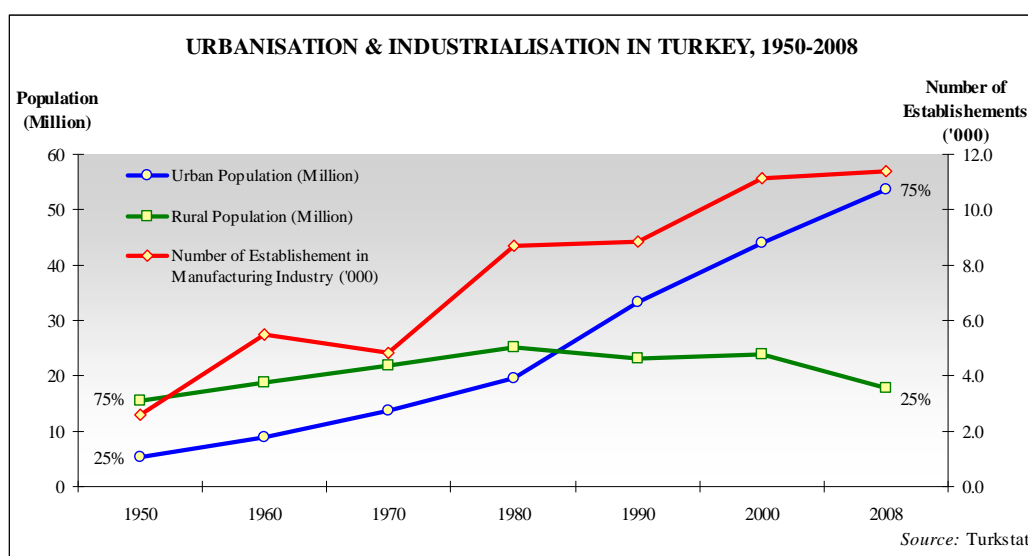


KEY ECONOMIC FIGURES OF TURKEY, 2006-11_f

	2006	2007	2008	2009 _f	2010 _f	2011 _f
Economic Growth						
GDP (TL Billion, in constant 1998 prices)	97	101	102	99	102	106
GDP growth rate (real)	6.9%	4.7%	1.1%	-3.6%	3.3%	4.5%
Per capita GDP (\$ in current prices)	7,583	9,234	10,436	10,913	11,398	12,164
Population						
Mid-year Population ('000 persons)	69,421	70,256	71,079	71,918	72,752	73,581
Balance of Payments						
Current Account (\$ Billion)	-32	-38	-42	-11	-19	-26
Exports FOB (\$ Billion)	86	107	132	104	112	120
Imports CIF (\$ Billion)	140	170	202	138	155	174
Direct investment in Turkey (\$ Billion)	20.2	22.0	18.2	9.1	10.2	12.0
Direct investment abroad (\$ Billion)	-0.9	-2.1	-2.6	-0.5	-0.6	-0.9
Employment						
Working age population ('000 of persons)	48,485	49,215	49,974	50,724	51,474	52,226
Unemployment rate (%)	9.9%	9.9%	10.6%	13.5%	13.9%	13.9%
Prices						
CPI end year	9.7%	8.4%	10.1%	7.5%	6.5%	5.5%

Source: Turkstat and SPO Pre-Accession Economic Programme, April 2009 f: Government forecast

Turkey is the second most populated country in Europe after Germany and the 16th in the world. The Turkish Statistical Institute (Turkstat) estimates the current population to be 71.5 million. Turkey's population is relatively young. In 2008, 28% of the population was aged under 14 and the portion of the population aged over 60 was only 8%.



Until the early 1980s, Turkey had a notably high share of rural population. Rapid urbanisation and industrialisation mean that by the end of 2008 the urbanisation rate of Turkey was close to the EU-27 average.¹ Turkey has five cities with over 1 million inhabitants. Istanbul's over 12 million people make it one of the largest cities in Europe.

¹ In the EU-27, 74% of the total population lives in cities and towns with more than 5,000 inhabitants. (Source: The Urban Audit, Eurostat, August 2008)

II THE ENVIRONMENT SECTOR IN TURKEY

2.1 OVERVIEW OF THE SECTOR

2.1.1 Brief History of the Sector

Environmental concerns in Turkey are of relatively recent origin, only beginning to develop as the rapid urbanisation and industrialisation mentioned above began to strain the fabric of the cities. Starting from the 1970s, the long lack of concern by both public and private sectors caused environmental pollution rose to dangerous levels.

However, the country's attitude towards protecting the environment has changed substantially in recent years. Successive governments have been adopting environmental legislation comparable to that of the European Union. The initial impetus to this came with the agreement between the EU and Turkey to launch a Customs Union in 1996. The start of negotiations for full membership of the EU has led Turkey to divide the discussions into 35 'chapters'. Chapter 27 covers environmental issues. The EU's screening of the situation in Turkey was concluded in June 2006 and concluded that considerable efforts were needed. Full negotiation on the chapter has not yet been launched. Environment is not one of the chapters frozen as a result of French and Cypriot objections.

Between 2003 and 2009, the EU provided approximately €50 million for the strengthening of Turkey's institutional capacity in the environment area. In the same period it allocated €160 million for projects such as waste water treatment. As of 2008, projects worth €58 million infrastructural projects had been started. Within IPA programme there was more than 130 projects needs €2 billion investment however the EU loan for the 2008-2013 period will be only €200 million.

The first government body responsible for environmental issues was established in 1973, being soon named the "Environmental Coordination Board" and tasked to overcome the lack of institutional and legal coordination between government institutions. In 1978, the Prime Ministry Undersecretariat for Environment (PMUE) was founded. This was given the responsibility to coordinate all national and international activities concerning the environment and to develop policy and legislation. Its most important achievement was the enactment of the Environmental Law in August 1983.

In August 1991, the Ministry of Environment was established, increasing the level of governmental authority for the protection and conservation of the environment. The increasing influences of civil society and the dictates of various international actors such as the European Union, the World Bank, and the OECD all contributed to increasing environmental concern.

The current ministerial structure was established in 2003, with the unification of Ministry of Environment and Ministry of Forestry under the name of Ministry of

Environment and Forestry (MoEF). The MoEF is the basic governmental institution responsible for environmental protection and improvement as well as protection and development of forests and forestry industry. The Ministry has eight main operating units:

- General Directorate of Environmental Management
- General Directorate of Environmental Impact Assessment and Planning
- General Directorate of Forestations and Soil Erosion Control
- General Directorate of Forestry & Village Affairs
- General Directorate of Nature Protection and National Parks
- General Directorate of Research & Planning
- Department of Foreign Relations & the EU
- Department of Education & Publication

The following government institutions are affiliated to the MoEF:

- The State Hydraulic Board (DSI)
- Turkish State Meteorological Services
- General Directorate of Forestry
- Environmental Protection Agency for Special Areas (EPASA)

In 2006, the Parliament approved a comprehensive amendment in the Environmental Law of 1983 and a new law on municipalities. The new regulations have strengthened the enforcement capacities of administrations related with environment and clarify responsibilities. Industry is engaged in voluntary approaches, especially in cement and chemical sectors.²

The process of aligning Turkish environmental practices with those of the EU's *acquis communautaire* was initiated by the MoEF following approval of the National Programme for harmonising legislation with the EU of July 24, 2003. The adaptation process is expected to be completed by 2023. The European Commission carried out a screening of Turkey's environmental practices and submitted its final report on these in 2007. The report asked Turkey to present an extensive strategy to the Commission. The "National Environmental Approximation Strategy (UCES)"³ was adopted by Turkey's High Planning Council (HPC) on February 7, 2007.

There has been significant progress in adaptation to the EU environmental legislation; however there are still missing areas concerning air, water, and nature protection, while several standards which are not consistent with the EU limits. The current situation is reviewed in the European Commission's Turkey 2008 Progress Report (*Annex 1*). This concluded:

Turkey has made progress in the area of air quality and good progress on strengthening the administrative capacity at central level. Some progress can be reported on waste, water and nature protection. However, the overall level of alignment remains low. Turkey has made no progress in the areas of industrial pollution and risk management and genetically modified organisms. Limited progress can be reported on chemicals. Delays in establishment of the EIA are hampering further improvements in implementation and enforcement.

² OECD, OECD Environmental Performance Reviews: Turkey, 2008

³ EU Integrated Environmental Approximation Strategy, MoEF, Ankara, (hereafter "UCES")

Turkey became a party to the United Nations Framework Convention on Climate Change as of May 24, 2004. It was initially included in both Annex I and Annex II, requiring it to support other countries in their emission decreasing activities. In 2001, Turkey was deleted from Annex II and included only in Annex I. Turkey accepts to limit its emissions, but is subject to less specific conditions on the rate of emission decrease compared to other Annex I countries. In 2009, Turkey finally acceded to the Kyoto Protocol. It has no obligations under this, but has joined the talks on the regime due to succeed this after 2012.

2.1.2 Market size

Expenditure on the environment in Turkey doubled between 2003 and 2007 and reached €5.5 billion: this was equivalent to 1.2% of GDP. The majority of expenditure was by the public sector, which accounted for 92% of the total in 2007. Private sector expenditure doubled during the period, reaching €438 million that year. The compound annual average growth rate (CAGR) was 21% within the period.

ENVIRONMENTAL EXPENDITURES IN TURKEY, 2003-2007 (€ Million)					
	2003	2004	2005	2006	2007
Public Sector, all	2,344	2,655	3,241	3,743	5,086
<i>Current expenditures</i>	1,436	1,646	2,027	2,134	2,646
<i>Investment expenditures</i>	909	1,009	1,214	1,609	2,439
Government ⁽¹⁾	468	484	629	586	637
<i>Current expenditures</i> ⁽¹⁾	130	180	126	144	118
<i>Investment expenditures</i> ⁽¹⁾	338	303	503	442	520
Municipalities	1,876	2,171	2,612	3,157	4,448
<i>Current expenditures</i>	1,306	1,466	1,901	1,990	2,529
<i>Investment expenditures</i>	570	705	711	1,167	1,920
Private Sector ⁽²⁾	205	210	275	321	438
<i>Current expenditures</i> ⁽²⁾	150	150	200	225	300
<i>Investment expenditures</i> ⁽²⁾	55	60	75	96	138
Total environment expenditures	2,549	2,865	3,516	4,064	5,524
<i>Current expenditures</i>	1,586	1,797	2,226	2,359	2,946
<i>Investment expenditures</i>	963	1,068	1,290	1,705	2,578
Share in GDP	0.9%	0.9%	0.9%	1.0%	1.2%
(1) Including public investment expenditures through Bank of Provinces					
(2) IBS estimates between 2003 and 2006					
Source: Turkstat and MoEF and IBS estimates					

In 2007, expenditure on environmental investments reached around €2.6 billion, equivalent to approximately 0.5% of GDP. The majority of investments were by public institutions. The private sector accounted for around 5% of investment in 2007.

2.2 PROFILE OF MAJOR SUB-SEGMENTS

2.2.1 Air

Air pollution and air quality management in Turkey are regulated by the “*Air Quality Control Regulation*” directive which came into force in 1986. Between 2003 and 2008, four supporting directives came into force, with these drawn up considering EU directives. The Environment Law of 1983 was amended by Law 5491 of 2006 which sets the framework for the development of air quality monitoring and measurement infrastructure in Turkey and also determines limit values of air quality. The MoEF expanded air quality monitoring by including 13 additional pollutants to be monitored on a regular basis with a new legislation came into force at June 6, 2008.

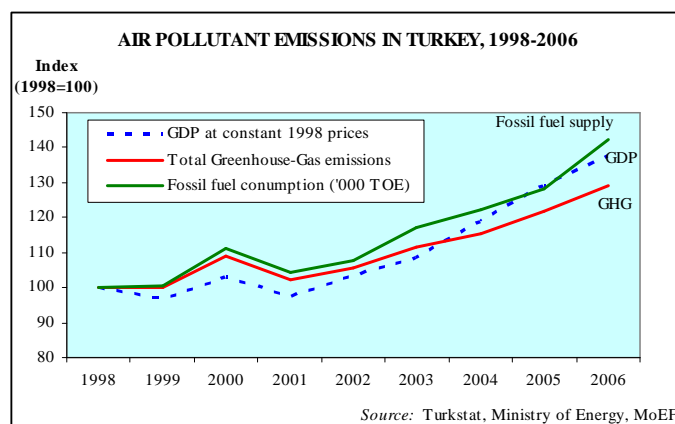
The competent authorities related to the air sector are MoEF, Ministry of Health (MoH), Governorships and municipalities. Within MoEF, there are two specific departments related to the air sector. The Measuring and Inspection Department is responsible for development of the measurement and monitoring infrastructure, laboratories and training. The Air Management department is responsible for general policy issues.



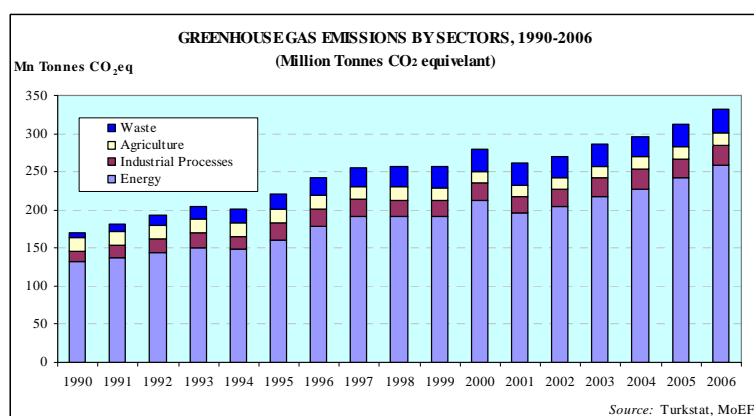
In 2007, there was €48 million of investment in airquality in Turkey, accounting for 2% of the total investment. 98% of this investment was by the private sector.

Emissions

Between 1998 and 2006, total greenhouse gas (GHG) emissions increased by 29% (from 257 Tg/CO₂eq in 1990 to 332 Tg/CO₂eq in 2006). The growth of GHG emissions paralleled the fossil fuel consumption and GDP growth rates of Turkey.



The energy sector accounted for 78% of GHG emissions in 2006. The other contributing sectors are waste (with a rapid increase from 4% in 1990 to 9% in 2006), followed by industrial processes (8%) and agriculture (5%). The most important improvement to reduce GHG emissions by the power sector was installation of flue gas desulphurisation units in all major coal-fired power plants. However, use of high sulphur fuel oil continues in power plants and heavy industry which comprises a key problem.



As of 2006, CO₂ emissions accounted for 82% and CH₄ emissions for 15% of GHG emissions. 92% of CO₂ emissions are from fossil fuel combustion. The replacement of lignite and coal by oil and natural gas in energy supply resulted in stabilising emission trends after 1998.⁴ As of 2007, natural gas became the largest primary energy source in Turkey with 32% share, followed by petroleum products with 31%.

Air quality

Rapid urbanisation since the 1950s has been one of the most important causes of low air quality in Turkey. Pollution in cities is the result of the usual factors - heating systems, combustion techniques, vehicles, poor fuel quality and wrong placement of the cities as well as industrial establishments and power plants. Air pollution becomes a major

⁴ OECD (2008)

problem in a number of cities during the winter season: in some provinces the pollution exceeds national air quality limits.

PROVINCES WITH THE HIGHEST CONCENTRATION OF SO₂ & PARTICULATE MATTER (PM), 2008			
mg/m ³ (microgram/m3)			
Sulphur dioxide (SO₂)		Particular Matter (PM₁₀)	
Kars	87	Van	147
Bitlis	83	K.Maras (Elbistan)	136
Canakkale	69	Igdir	129
Siirt	68	Mardin	117
Aydin	65	Kutahya	114
Isparta	64	Karabuk	111
Kutahya	49	Isparta	110
Van	48	Duzce	108
Zonguldak	48	Konya	107
Nevsehir	47	Karaman	107
<i>Source: Turkstat</i>			

In urban areas, during the last two decades there have been some improvements in the air quality and decrease in concentration of SO₂ and PM. This is mainly because of substitution of low quality lignite with natural gas and low-sulphur imported coal for heating during the period. As of end-2008, there were 63 provinces with access to natural gas in Turkey. The natural gas transmission company, BOTAS, aims to connect all 81 provinces to natural gas within next five years. The permitted specifications of solid fuels (coal, wood, briquette and biomass etc.) have been determined by the MoEF and sale of these products in packages has become obligatory.

Another major source of low air quality, especially in the larger cities, is motor vehicles. Here too, there have been some improvements. SO₂ limits were decreased with “The Quality of Petrol and Diesel Fuels” directive which came into force in June 2004: this is harmonized with related EU directives. As of January 2006, sale and use of leaded gasoline was banned. To monitor and control the exhaust gas of motor vehicles, regular controls have become obligatory and 900 stations have been licensed for this purpose.

In addition to regulations, economic incentives like imposing lower taxes for natural gas, LPG and biodiesel have been introduced to promote low sulphur products.

In the case of **air quality**, the European Commission concluded in 2008 that Turkey had made good progress in alignment with framework legislation and daughter directives. “Progress has also been made on the sulphur content of liquid fuels in domestic heating systems. The administrative capacity for regional air quality has been improved by establishing a clean air centre in Marmara. No progress has been made on legislation related to the acquis on emissions of volatile organic compounds, on the sulphur content of certain liquid fuels or on national emission ceilings.” (*See Annex 1*)

Future investments

The investments needed by public institutions between 2007 and 2023 for the EU environmental harmonisation for air sector are forecast to total €37 million. This is mainly for monitoring equipment, measurement systems and quality assurance systems investments.

Before 2002, air monitoring was a responsibility of the Ministry of Health but this responsibility has now been shifted to MoEF. In the past, there were 191 semi-automated measurement stations that monitored SO₂ and PM concentrations in 71 provinces. As of 2008, there are 111 automated measurement stations in all 81 provinces and three districts for SO₂ and PM₁₀. The MoEF targets:

1. Establishment of an additional 98 automatic measurement stations to reach 209 stations by the end of 2014: 42 of these stations will be located in rural areas, 99 stations in urban and 25 in industrial areas, while the remaining 43 will be placed along busy highways and other hot spots.
2. Establishment of a national calibration centre to provide services for these stations
3. One national and seven regional clean air centres responsible for monitoring network management, data processing and storage, emission inventories, clean air plans, action and implementation plans

MEASUREMENT STATION TYPES BY REGIONAL NETWORK					
Regional Network	Residential	Traffic	Industry	Rural	Total
Istanbul	19	9	7	4	39
Izmir	12	5	4	4	25
Konya	11	4	2	5	22
Ankara	15	6	5	7	33
Adana	10	5	5	4	24
Samsun	7	3	1	5	16
Diyarbakir	15	8	1	7	31
Erzurum	10	3	0	6	19
Turkey -Total	99	43	25	42	209

Source: MoEF

Within the first stage of the above plan, the establishment of Marmara region clean air centre has been started and 39 new automatic measurement stations are planned to be established initially.

Led by investments by Tüpraş, the country's oil refinery company, there will be over €2 billion investment for the improvement of air quality. The total cost of the preliminary assessment studies for air quality will be €6 million. The total cost forecast for the establishment of these monitoring systems will be €11 million. The maintenance and operating cost of all the stations will come up to € 1.5 million. Maintenance and operating costs related with measurement stations will continue after the establishment

of the monitoring system in 2012 and the related cost will be an additional €1.5 million. In total, the public sector investment for air quality framework will be €37 million between 2007 and 2023.

AIR SECTOR INVESTMENT REQUIREMENTS, 2007-2023 (Million €)									
	Total	2007	2008	2009	2010	2011	2012	2013	2014-2023
Air Quality Framework	37	3	3	3	3	3	2	2	18
Fuel Quality (Tupras*)	1,982	-	-	-	-	-	-	-	-
Total**	2,019	3	3	3	3	3	2	2	18

* The implementation related to fuel quality is targeted to be completed due to the investment of Tupras Refineries.

** Tupras' €391 mn investment for desulphurization of diesel oil after 2007 and around €1.2 billion investment for desulphurization of fuel oil has not been included in the total.

Source: MoEF, Tupras, UCES

Major companies in air sector

There are 29 private sector companies and over 30 public institutions⁵ accredited as environment air quality measuring and testing laboratories, according to the Turkish Accreditation Agency (Turkak). The list of private sector companies is below.

ACCREDITED ENVIRONMENTAL TESTING LABORATORIES, 2008		
AEM Cevre	Deng Cevre Analiz	Flora Muhendislik
Agrolab	Dokay Muhendislik	Goksen Cevre Olcum
Aritsan Cevre Olcum	Egelab	Hakser-Ata
Artek Muhendislik	Egetest	Halic Cevre Teknolojileri
Bilim Muhendislik	Ekolab	Izcev
Cedfem	Ekolojik Cevre	Kelebek Kimya
Cev-Danis	Ekosistem Analiz	Nem Muhendislik
Cevre Norm	Encon	Saniter
Cinar Cevre Olcum	Escam	Tidap Cevre

Source: Turkak

Most of these companies are also active in consultancy, design and supervision in relation with the air sector.

In air monitoring and measuring equipment, US-originated companies dominate the sector. The recent public sector tenders for the air quality measurement station of Turkish Sugar Factories and Samsun province has been awarded to Titas, who is the distributor of Environment S.A. of the USA. There is no local production of air measurement and monitoring equipment. The major gas, air, emission analysis device

⁵ Including universities, governorships, ministries, army etc.

companies and their representatives are listed below. Tecora is the main Italian company.

GAS & AIR, EMISSION ANALYSIS DEVICES SUPPLIERS, 2008		
Distributor	Main Company	Country
Bilim Muhendislik	Madur	USA
	Tecora	Italy
Cev-tek	Madur	USA
Ekosis	Monitor Europe (Casella)	UK
Econorm	Teledyne	USA
Sudem	Teledyne	USA
	Tecora	Italy
	Seres	France
Tetra	Thermo Fisher Scientific	USA
Titas	Environment S.A.	USA
<i>Source: IBS</i>		

Ekosis Ltd. won the maintenance and service tender for the measurement station of MoEF in 2009.

Between 1991 and 2008 Turkey invested \$546.9 million for the flue gas desulphurisation rehabilitation of its coal power plants and finalised all projects as of 2008. All of these power plants belong to the state company EUAS. Among domestic companies, Gama and Guris are the leading ones in this segment as well as Alarko and Tekfen. Among international companies, Lurgi Lentjes (Germany) carried out most of these projects. The contractors of these projects and the project values are as follows:

FLUE GAS DESULPHURISATION PROJECTS IN TURKEY, 1991- 2008			
Power Plant Name	Contractors	Project Value, \$ Mn	Finalisation Year
Yenikoy	Lurgi Lentjes, Guris	51.3	2008
Yatagan	Lurgi Lentjes, Guris	77.8	2007
Afsin Elbistan	Mitsubishi, GTT, Gama	158.5	2005
Kemerkooy	Babcock Wilcox, Gama	84.1	2002
Cayirhan 3-4	Lurgi Lentjes, Guris	57.5	2000
Kangal	Mitsubishi, Gama	35.0	2000
Orhaneli	Noell KRC, Alarko	43.2	1998
Cayirhan 1-2	Lurgi Lentjes, Gama	39.5	1991
Total		546.9	
<i>Source: EUAS</i>			

As the only refinery company in Turkey, Tupras is responsible for the desulphurisation of motor vehicle fuels. This was privatised in 2006. It has spent over \$1 billion for expansion and modernisation investments. The Izmit refinery desulphurization of diesel oil unit cost \$390 million and Kirikkale refinery cost \$372 million. The Kirikkale project's equipment and system supplier was ABB and its contractors were GS (S. Korea), Tecnicas Reunidas (Spain), Gama and Alarko (Turkey). In 2008, Tupras started

its investments programme for desulphurisation of fuel oil along with the directives of MoEF and the EU. The total project cost is estimated as around \$1.6 billion.

2.2.2 Water & Wastewater Management

The main regulation related with water quality in Turkey is the “*Regulation on the Control of Water Pollution*”. This regulation came into force in 1988 and was revised in 2004. The regulatory framework for managing water pollution has been substantially upgraded during the last decade, but the European Commission concluded in 2008 that “the overall level of alignment remains low. The institutional framework for water management is not organised on a river basin basis. Trans-boundary consultations on water issues are at an early stage.” (See Annex I).

The management and control of water pollution has been shared among a number of government organisations. The responsible authorities are Ministries of Agriculture and Rural Affairs (MARA), Culture and Tourism (MoCT), Environment and Forestry (MoEF), and Health (MoH); the State Planning Organisation (SPO); the General Directorate of State Hydraulic Works (DSI; under MoEF since 2007) and the Undersecretariat of Maritime Affairs (UMA). Each of these government bodies has developed plans, monitoring systems and regulatory measures among which there are overlaps and gaps.⁶

RIVER BASINS OF TURKEY



In 2007, there was €2 billion of investment in water sector in Turkey, accounting for 78% of the total investments. 97% of the investment expenses was by public sector. The drinking water investments accounted for 59% of the water sector investments and was followed by wastewater investments which accounted for 41%.

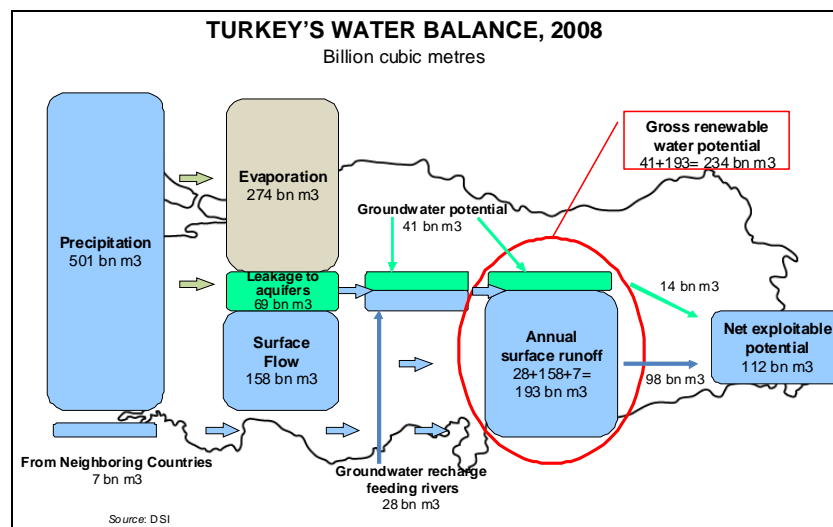
Water resources & availability

Turkey is geographically divided into 25 hydrological basins. The total surface water run-off is 193 billion m³/year in those 25 basins and 31% of the potential is constituted

⁶ OECD (2008)

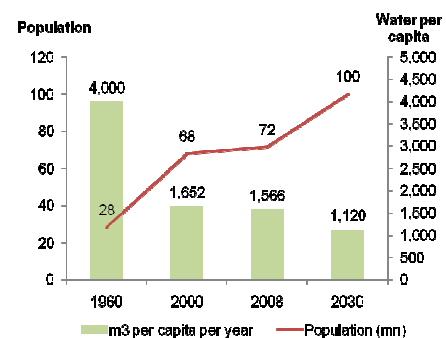
by the Euphrates (Firat) and the Tigris (Dicle) Rivers both of which have their sources in the eastern part of the country.

Studies carried out in the early years of this decade found that Turkey had a net exploitable water potential of 112 billion cubic metres per year. Current consumption is well below this, running at an estimated 46 billion cubic metres, of which irrigation accounted for 34 billion, domestic consumption 7 billion and industry 5 billion. However, DSI, the state body responsible for water management, forecasts that by 2023, consumption will reach the level which Turkey has available, again with irrigation leading (72 billion), industry next at 22 billion, followed by domestic consumption of 18 billion.



Turkey is not a “water-rich” country as it is often presumed. As of 2007, the quantity of water per capita per year was 1,586 m³ which was about 1/5th of the water-rich countries. In the past, it used to have more than 4,000 cubic metres of water per inhabitant per year. Today, that figure is down to 1,566 m³/year and by 2030 it is expected to have fallen to the 1,120 m³/year level, close to the 1,000 m³/year usually considered to indicate a state of water deficiency.

TURKEY'S EVAPORATING WATER SURPLUS, 1960-2030



Drinking water

As of end-2006, out of 3,225 municipalities in Turkey, 3,167 had a drinking water supply network. There was considerable improvement in the availability of safe drinking water during the last decade. The share of population with access to drinking water supply network increased from 54% in 1996 to 82% in 2006, and the share of

population receiving drinking water from water treatment facilities increased from 10% in 1996 to 41% in 2006.⁷.

Between 1997 and 2006, the capacity of the water treatment plants was increased 2.6 times from 1.5 to 3.9 billion m³/year and the amount of drinking water treated in water treatment plants increased by 6.6 times and reached 2.4 million m³/year in 2006. The capacity utilisation rate of the water treatment plants was 61% and where there is no water treatment plant, a chlorination system along the network has been put in place. There was no water treatment facility in 33 provinces and the largest water treatment capacity was in Istanbul accounting for 31% of the total and followed by Izmir.

DRINKING WATER TREATMENT PLANTS IN TURKEY, 2006				
Type of Plant	Number	Capacity '000 m³	Treatment '000 m³	Capacity Utilisation
Physical treatment plants	69	163,128	65,528	39%
Conventional plants	68	3,829,791	2,362,437	62%
Advanced treatment	2	1,142	675	59%
Total	139	3,994,060	2,426,639	61%

Source: Turkstat (2008)

After a rainy and snowy spring and winter in 2008, currently in Spring 2009 most of the water reservoirs dams of large cities are over 90% full. However after two years of dry period, in t summer 2008 the water level dams decreased to less than 5% in Ankara and to less than 15% in Izmir. Due to water scarcity, in Izmir, there was an increase in the usage of groundwater and the arsenic contamination became a major problem. These problems led major Municipalities to take emergency actions. In Istanbul the first phase of the connection of the city to Melen River was finished urgently. The connection of Ankara to the Kesikkopru Dam on the Kizilirmak River 128 kilometres away (which was a measure originally planned for the 2020s) was finished in 2008. However there are still big discussions on use of Kizilirmak water in Ankara, with some groups arguing that the quality of water to be very low and toxic and the municipality arguing to the contrary. In Izmir, the Municipality ordered for the largest arsenic treatment plant in the world. The first phase of the project has been finalised in January 2009 and the second stage has been finalised more recently. A Turkish-Italian consortium of Nema Kimya and Culligan supplied engineering and equipment of the arsenic treatment plant. The long-term planning of these municipalities currently involves using reverse osmosis or nano filtration to convert sea water into drinking water.

These problems are not specific to major cities of Turkey; the unsafe tap water is a significant problem in many of the cities and peripheries of cities in Turkey. Some smaller towns in Eastern Anatolia face a problem of access to drinking water. The water utilities experience relatively high rates of unaccounted water use (an average of

⁷ Turkstat, Survey of Drinking Water Statistics of Municipalities in 2006, Ankara, April 2008

55%), due to unbilled usage, illegal usage and network losses and leakages. The private sector involvement in this sector is very limited.

Excluding some of the above investment needs, the strategy document of MoEF (UCES 2006) estimated €13 billion for new and modernisation investments in water treatment and drinking water networks between 2007 and 2023. The modernisation and rehabilitation investments is expected to be three times more than the new investments due to ageing of the existing treatment facilities and networks.

Wastewater

As of end-2006, there were 2,321 municipalities (out of 3,225 municipalities) having services of sewerage systems in Turkey, indicating the population connected to sewerage as around 87% of the total municipal population. The number of wastewater treatment plants was 184, according to Turkstat 2006 statistics. Although there was a significant improvement compared to 1990s⁸, the portion of the population connected to wastewater treatment system was only 51% in 2006.⁹

According to more recent information by MoEF, the number of waste treatment facilities reached to 248 and the number of municipalities increased up to 419 as of end-2008. As a result of further investments after 2006, the population connected to wastewater treatment system reached 65% of the total municipal population.¹⁰

Although there were significant developments in the area, there is still more to do in water treatment and sewerage network. Approximately 2,942 new treatment plants are required to be built in towns with populations over 2,000 to implement the EU Urban Wastewater Treatment Directive. To improve the sewerage system, an additional 20,000 kilometres has to be added to the sewerage network.

The European Commission concluded in 2008: “Some progress can be reported on alignment with the **waste management** acquis. Implementing legislation on polychlorinated biphenyls (PCB & PCT) and on the control of waste oils has been adopted. Furthermore, restriction of use of certain hazardous substances in electrical and electronic equipment and on restoration and management of extractive industry sites has been adopted. Alignment in this area is well advanced. However, Turkey does not have a national waste management plan. Progress on end-of-life vehicles and waste electrical and electronic equipment has been very limited. No progress has been made regarding the directives on landfill.” (See Annex 1)

The strategy document of MoEF (UCES 2006) estimated €18 billion for investment in and rehabilitation of wastewater treatment and networks between 2007 and 2023. The EU funds are expected to support 40% of wastewater treatment projects (and 50% after

⁸ The population connected to wastewater treatment system in 1990 was 9% of the total municipal population.

⁹ Turkstat, Survey of Sewage System Statistics of Municipalities in 2006, Ankara, published in April 2008

¹⁰ MoEF, Environment Works and Investments 2003-2008, Ankara, April 2008

2011), while local administrations will co-finance the EU funded projects using credits from the Bank of Provinces.¹¹

Water monitoring

Currently there are different governmental institutions responsible for water monitoring. The DSI/MoEF is responsible for water quality monitoring; the MoH is responsible for drinking water quality monitoring and the MARA is responsible for monitoring the nitrate parameter for freshwater and groundwater.

The merger of MoEF and DSI in 2007 consolidated river and sea quality networks. The number of monitoring stations operated by DSI has increased from 1,080 to around 1,300 by the end of 2008. Around 80% of these stations are monitoring surface waters and 20% groundwater. There are 21 regional laboratories that belong to DSI and are analysing the samples collected by these stations.

The MARA operates 1,574 sampling stations (1,026 for surface waters and 548 for ground water) and 40 provincial control laboratories to monitor nitrate parameters.

As mentioned by the UCES 2006 there is a need for strengthening of the institutional structure to ensure the full and effective implementation, monitoring and inspection of the existing legislation as well as the related EC Directives.¹²

In the 2007-2023 period, emergency response centres are planned to be established within the scope of the “*Law on the Principles for Interventions and Compensation of Losses in Cases Where the Sea and its Environment are Polluted with Petroleum and Other Substances*”. In addition, the current monitoring networks of DSI and MARA as well as MoH are planned to be rehabilitated and improved.

Future investments

The investments needed for the EU environmental adaptation for the water sector by public institutions is expected to be €34 million between 2007 and 2023. The breakdown of investment during the period is given overleaf:

Expenditure is mainly for new network development and network renovation investments as well as new treatment plants and rehabilitation investments of the existing plants both for wastewater and drinking water.

The above analysis includes the harmonization costs of 15 directives and eight sub-directives out of 24 directives to be harmonised. The main gaps in the above plan are the protection and treatment of groundwater resources as well as a marine strategy, protection of marine and marine environment and its implementation.

There are also investments necessary by manufacturing industry and tourism companies. This will include investments mainly for water treatment facilities of

¹¹ UCES (2006) and OECD (2008)

¹² UCES (2006)

Organised Industrial Zones (OIZs), tourism facilities and large size private residential sites.

WATER SECTOR INVESTMENT* NEEDS, 2007-2023 (Million €)									
	Total	2007	2008	2009	2010	2011	2012	2013	2014-23
Drinking Water	12,743	460	517	571	620	641	659	691	8,584
Treatment Plants	5,332	210	234	249	279	268	281	293	3,518
<i>New investment</i>	1,510	74	87	91	109	87	89	90	883
<i>Rehabilitation</i>	3,822	136	147	158	170	181	192	203	2,635
Networks	7,411	250	283	322	341	373	378	398	5,066
<i>New investment</i>	1,147	26	41	62	63	77	64	66	748
<i>Rehabilitation</i>	6,264	224	242	260	278	296	314	332	4,318
Wastewater	18,083	687	717	765	793	828	854	880	12,559
Treatment Plants	6,522	279	286	286	293	257	290	358	4,473
<i>New investment</i>	4,983	229	230	230	232	191	219	277	3375
<i>Rehabilitation</i>	1,539	50	56	56	61	66	71	81	1098
Networks	11,561	408	431	479	500	571	564	522	8,086
<i>New investment</i>	3,838	149	150	171	168	214	183	117	2686
<i>Rehabilitation</i>	7,723	259	281	308	332	357	381	405	5400
Agricultural Nitrate	270	15	15	16	16	16	16	16	160
Water Framework Directive	1,550	91	91	91	91	91	91	91	913
Dangerous Substances	1,300	76	76	76	76	76	76	76	768
Bathing Water Directive	23	1	1	1	1	1	1	1	16
Total	33,969	1,330	1,417	1,520	1,597	1,653	1,697	1,755	23,000
*Note: excluding investment expenses for "Protection of Groundwater"; "Protection of Fish Life"; "Protection of Shellfish Life"									
Source: MoEF, UCES									

Major companies in water sector

Water management and operation

DSI, the state administration responsible for water management, and water, and sewerage administrations of the municipalities are the major bodies for the supply and treatment of water. Most of the large scale projects are developed by DSI and the municipalities.

There has been some private sector involvement in the sector:

- In Izmit, Thames Water has been involved in a “Build Operate and Transfer “ scheme involving a dam and reservoir, raw water transfer mains, water treatment plant and treated water transmission mains to service reservoirs. The contract has led to continued disputes with the municipality over Thames’s charges.
- In Antalya, Suez-Lyonnaise des Eaux gained a 10-year operation and maintenance contract, this being the first concession contract awarded to a private operator in Turkey but taken back by the municipality after the first five-year review. Antalya Su ve Atıksu İdaresi (ASAT) has contracted out

responsibility for operating Lara and Hurma wastewater treatment plants to Envy Enerji & Cevre (a local company) for 2008-2009.

- Alcesu, a subsidiary of Veolia Water, has been responsible for the distribution of water in the coastal towns of Cesme and Alacati since 2003.
- Another concession contract for the construction and operation of Gulluk (Bodrum-Mugla) water and wastewater facilities has been awarded to TASK for 35 years. TASK Water Treatment Investment Construction & Management Co. was established in April 2005 as a partnership of Akfen Holding A.S., Meteksan Sistem A.S. and TASK Water BW (Tahal Group –Israel). TASK's second concession agreement was with Corlu (Tekirdag) Municipality. TASKS received the State Council conception and approval and started to operate the company but there has been large opposition from local civil organisation against to this privatisation. TASK also won the tender for the construction and operation rights of the Gebze Dilovasi OIZ wastewater treatment facilities for 27 years. In the facilities 115 million m³ of industrial wastewater will be treated.
- The Istanbul Water and Wastewater Administration (ISKI) has contracted out responsibility for operating a new wastewater treatment plant to a local company (Kuzu Toplu Konut) for 3 years with an option to extend by 2 years.
- The €17.8 million contract for the construction, testing, service and maintenance of Bursa wastewater treatment plants was awarded to the consortium of EMIT (Italy), OTV-Veolia (France) and Sistem Yapi (Turkey).
- A consortium leaded by VaTech-Wabag (Austria), Yuksel Insaat (Turkey), Ener (Turkey) and Serco (UK) constructed the Adana East and West wastewater treatment facilities on a build-operate-transfer (BOT) contract with a three-year operational phase after which the plant reverted to the Adana Metropolitan Municipality. The construction was finished at 2004, and the consortium operated facilities between 2004 and 2007 and transferred to the water management company of Adana Metropolitan Municipality.
- A Turkish and Spanish consortium of OHL (Spain), Sistem Yapi (Turkey), Inima (Spain) awarded for the construction, and 36 months operation and maintenance of the Konya wastewater treatment plant. The project value is \$28.5 million and started operation by the beginning of 2009.

Construction and engineering companies

In the field of water and wastewater treatment market, engineering companies are the major players. Most of the contractors operating in water sector offer a full range of services, from project consultancy through to design and installation.

With 141 members, Turkish Contractors Association (TCA) represents the leading construction companies in Turkey. The business volume of the members of TCA accounted for nearly 70% of all the domestic and 90% of all the international

contracting work done by the Turkish construction companies. Of the 141 member companies:

- 110 have experience and capability for drinking water constructions
- 96 o have capability for waste treatment projects
- 86 are active in construction of dams

Within TCA member companies, about ten large contractors lead the water sector projects. These are:

Alarko	Currently carries out the Cyprus potable water supply project with a project value of \$290 million. The project will be completed in 2011. In the past, Alarko constructed Tuzla biological wastewater treatment plants for ISKI, and Izmit wastewater treatment plant for Izmit Water & Sewage Administration.
Cukurova Insaat	Completed Siirt drinking water supply project
Haselsan	Constructed various water and wastewater treatments plants and water and sewerage networks for municipalities and Bank of Provinces.
Ismail Celik	Currently carries out the Kahramanmaras wastewater treatment plant construction with a project value of \$15.3 million. The project will be finalized by the end of 2010.
Ilci Insaat	Currently carries out the Manisa (Golmarmara) wastewater treatment plant construction and Suleymania–Rania (Iraq) water treatment facility construction.
Kuzu Insaat	Currently provides operating services for a ISKI wastewater treatment plant and construction of ISKI Tuzla wastewater plant.
Limak	Has significant number of water, wastewater treatment, network as well as dam projects. The company established consortium with EMIT before.
Oztas Insaat	Has significant project experience in CIS countries and is currently constructing a seawater treatment plant in Turkmenistan.
Su Yapi	A leading company in water sector. Its current projects include: Azerbaijan national water supply and sanitation project, Wadi Dayqah dam & water supply scheme to Muscat and Quriyat (Omman), Antalya sewerage network construction and water network rehabilitation project, technical assistance to prepare drinking water supply projects for 8 municipalities in Turkey, Batman water supply and sanitation project (<i>financed by KwF</i>), Siirt water supply and sanitation project (<i>financed by KwF</i>), Istanbul water supply project Stage II, Melen System, construction supervision of Yalova Cinarcik, Tesvikiye, Kocadere and Esenkoy sewerage systems, wastewater treatment

plant and sea outfall (*financed by Kuwait Fund for Arab Economic Development*), Networks, overflow structures and wastewater treatment plant in central districts of Ankara (Ankara Water & Sewerage Administration - ASKI).

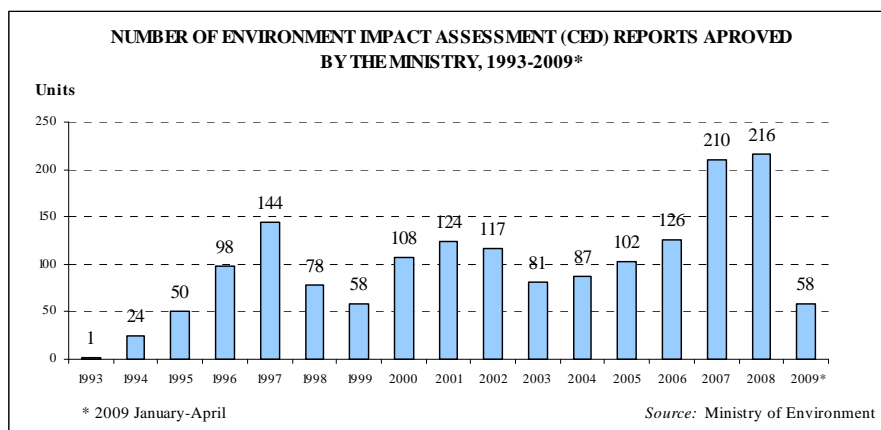
Teknotes

Has major experience in construction of thermal power plants, is currently constructing a thermal power plant and sea water desalination plant in Saudi Arabia.

In addition to the above companies, Arbiogaz, Aritim Muhendislik, Artas, Avrasya Aritma, Deniz Muhendislik, Hidrotek (Veolia), Egeşis, Envirochem, Hazar Su Aritma, Mass Aritma, Polisu Çevre Teknolojileri are leading engineering and contacting and equipment providers specialised at water and wastewater sector in Turkey.

Mass Artima currently carries out three large scale projects including Starzagora and Dimitrovgrad wastewater treatment plants in Bulgaria, Alaweer sewage treatment plant in Dubai and Zonguldak wastewater treatment plant, sewerage network and sea outfall in Turkey. Aritim Muhendislik was awarded for the second arsenic treatment tender of IZSU for Menemen and Halkapınar area with a project value of €4.6 million. Deniz Muhendislik recently completed the Bodrum Gulluk wastewater treatment facility with a project value of €1 million. Artas carries out the treatment facilities construction project of four State Sugar factories.

In *consultancy services*, competition is high and private sector companies are the principal players in Environmental Impact Assessment (EIA) and master plan studies. There are 157 engineering companies having EIA reporting licence issued by the MoEF as of April 2009. Between 1993 and 2009, 1632 EIA reports were approved by the MoEF. The yearly number of approved EIA reports increased significantly and reached over 200 per year during the last two years.



Among engineering companies, Serdar Engineering, M&T and Cinar are leading three companies with the number of approved EIA projects between 1993 and 2009 April.

LEADING ENGINEERING COMPANIES IN ENVIRONMENT, 2009

	Number of EIA Projects Approved 1993-2009 April	Share
Serdar Muhendislik	108	6%
M&T Muhendislik	99	6%
Cinar	88	5%
PRD	62	4%
Aktel	61	4%
Yilmaz Muhendislik	57	3%
Demo	50	3%
MGS Cevre	43	3%
Topcuoglu Muhendislik	31	2%
Envy	30	2%
Encon	28	2%
ITU University	27	2%
Nazka Muhendislik	27	2%
Selin Insaat	27	2%
Asta	24	1%
Other 142 companies	920	55%
Total	1682	100%

Source: IBS based on MoEF data.

Among foreign companies who have been involved in the environmental consultancy projects in Turkey are A. Gibbs Anglian Water, Arup, Babbie, Betriebe (BWB), Berliner Wasser, Cowi, Dar GmbH, Degromont, ERM, Generale des Eaux, Gleeson, Halcrow, Hyder, IGA Ingenieurgesellschaft Abfall, Keviegh, Montgomery Watson, Paterson Candy, Passavant Werke, Purac, Suez Lyonnaise des Eaux, Thames Water, ULG Consultants, United Utilities, Welsh Water and W.S. Atkins.

International companies

Leading international water and wastewater companies such as EMIT SpA (Italy), Serco (UK), Suez (France), Thames Watson (UK), Veolia (Germany), Va tech (Austria) are very active in Turkey. EMIT (Italy) has significant market share and was awarded as the main contractor or contractor of a number of projects worth some \$82.6 million since 2005. Four of these projects have been finished between 2007 and 2008 and another one will be finalised within 2009.

PROJECTS OF EMIT IN TURKEY

Project Name	Client	Project Value (\$ Mn)	Date of Completion
Mersin wastewater treatment	Gen. Directorate of Mersin	15.3	2009
Melen water treatment	DSI	10.9	2008
Bursa East & West wastewater treatment	Bursa Water & Sewerage Adm.	23.1	2007
Izmit wastewater treatment and sea outfalls	Bank of Provinces	23.8	2007
Sanliurfa wastewater & pumping	DSI	9.5	2007

Source: EMIT webpage

Culligan Italiana SpA (Italy) is another company active in Turkey. Together with Nema Kimya, Culligan won the tender for the arsenic treatment plant construction in Goksu-Sarikiz wells belonging to Izmir Water and Sewerage Administration (IZSU) in 2008. The total project value was €10.7 million. The project was financed by the Greater City Municipality of Izmir. Examples of selected finished projects by Culligan in Turkey are as follows:

PROJECTS OF CULLIGAN IN TURKEY	
Drinking water	Established eight drinking water treatment facilities in Turkey including Adapazari municipality (103,680 m ³ /day), Karapinar (Konya) municipality (12,500 m ³ /day), Gaziantep Burc lake (6,500 m ³ /day)
Industrial process water	Established four industrial process water facilities in Turkey including Zafer Plaza (Bursa) (600m ³ /day), Lafarge Cement (96 m ³ /day)
Desalination of water	Established four desalination facilities for industrial process water including Hyundai Assan (100 m ³ /day), Dogan Publishing (24 m ³ /day)
Biological treatment	Three biological treatment facilities are constructed in Turkey including that of Tuborg Beer (2,500 m ³ /day), Usak Leather OIZ (32,000 m ³ /day)
<i>Source: Culligan Turkey</i>	

Equipment importers

No significant importers exist in water sector. Major foreign equipment brands in the market are as follows:

MAJOR FOREIGN BRANDS, 2002	
Product/Technology	Brand
Automatic control instruments	Allen Bradley, Mapro, Siemens
Automatic dosaging pumps	Emec, Astral, Seko, Dozotron
Blowers	FPZ, Hibon, Long Tech (Taiwan), Rubishe
Diffuser- air filtration	Adi, Oxyflex
Hydrometers	Teccis
Heat exchanger	Alfa Laval, Danfoss
Pumps	Atlas, Bigiesse Desauero, Dreno, Inox, ITT Flygty, Wilo, Layne Bowler, Lowara
Resin	Rohm Haas
Valves	Danfoss, Erhard valves, Fisher, Honeywell, ThyssenKrupp, Spirax Sarco, Tyco,
<i>Source: IBS</i>	

In pumps, compressors and valves, there are around five leading major local producers and a dozen foreign brands. The competition is intense. Alarko, Ideal Pump, King Pumps, Mas Pumps, Samsun Makina are the major domestic producers. There are also local manufacturing facilities of international players such as Anadolu Flygt (ITT Water & Wastewater), KBS Pumps (Germany). Wilo (Denmark) and Grundfoss (Germany) with significant share within imported brands. Deniz Muhendislik, Eta Ekipman,

Mettrans, Sispa, Sistem Yapi are important distributors. Eta Ekipman distributes pumps of Desauro Srl, Dreno Pompe Srl, Mapro International as well as blowers of Mapro International and control instruments of Emec Srl from Italy. Sispa distributes vacuum pumps and blowers of FPZ and vacuum pumps of Bigiesse from Italy.

In plastic and steel pipes domestic companies dominate the market. In steel pipes Borusan Mannesmann, Emek, Noksel, Umran Celik are leading brands. In plastic pipes Firat Plastic, Hakan Plastic, PilSA, Pimas, Rehau, Subor, Superlit, Vesbo are leading brands.

Treatment chemicals

Sector experts estimate the market size for wastewater treatment chemicals in Turkey as \$300-400 million, including expenditures by the municipalities. Industry experts concur that the growth prospects for water treatment and consumption of associated chemicals will become more concrete once industries and municipalities currently lacking waste treatment submit their plans to the Ministry as required by the new Environment Law. The suppliers mentioned by the interviewees are listed in the table below. While the chemicals manufactured domestically are provided by distributors most of the time, the imported polyelectrolytes are more often bought from the foreign manufacturer directly.

Plants in Turkey produce all the chemicals in the below list except anionic and cationic polyelectrolytes.

MAJOR SUPPLIERS	
Aluminium sulphate	Ak-Kim, Albar Kimya, Dostel, Ipek Kimya, Kardemir (via intermediaries), Koruma
Anionic polyelectrolyte	Ares Muhendislik, Degussa, Deren Kimya, Green Chemicals (with Henkel's patent), Mas Aritma, Polikim (Importer being Ciba)
Cationic polyelectrolyte	Ciba, Cyctec, Degussa, Deren Kimya, Pol-Sa (manufacturer being Ashland of the USA), SNF(France), SNS Turkiye, Stockhause (German), Mars Kimya, Polikim (Importer being Ciba), Tumaylar
Hydrochloric acid	Deren Kimya, Kalkim, Mars Kimya, Tumaylar
Iron (iii) chloride	Ak-Kim, Berk, Bultas, Kalender, Kalkim, Mars Kimya, Tumaylar
Iron sulphate	Ak-Kim, Deren Kimya, Koruma
Lime	Ak-Kim, Cimtas, Kaksan, Nuh Cimento, Nur Kirec, Koruma, Kalkim, Paksan
Phosphoric Acid	Mars Kimya, Tumaylar
Sodium hydroxide (Caustic)	Albar Kimya, Mars Kimya, Tumaylar
<i>Source: IBS.</i>	

2.2.3 Solid Waste

The main regulations related with solid waste in Turkey are the “*Control of Solid Wastes*”, and the “*Control of Medical Wastes, and Hazardous Waste Control Management*”. The authority primarily responsible for solid waste management is the MoEF, and within the Ministry, the General Directorate of Waste Management. There are a number of other ministries, government agencies and local authorities with lesser responsibility role in the implementation. These are the Ministry of Industry and Trade, the Ministry of Interior Affairs, the Ministry of Public Works and Settlement, municipalities, the chambers of trade and industry and the Turkstat. The National Programme for solid waste management was published at the end of 2006.

In 2007, investment in solid waste sector in Turkey was €122 million, comprising 5% of the total investment. 83% of this investment was by the public sector.

Current Situation

In Turkey, the handling of solid waste is seen as a social service that should be performed at minimum cost. There is now a growing awareness that traditional methods for dumping and annihilation are, in fact, not the least-cost methods. Central and local administrations are slowly but surely realising that proper technology must be sought and economic aspects must be taken into account if waste is to be processed cheaply and effectively.

MUNICIPAL SOLID WASTE INDICATORS FOR 2001-2006					
	2001	2002	2003	2004	2006*
<i>Solid Waste Indicators</i>					
Total Number of Municipalities	3,215	3,215	3,215	3,225	3,225
Municipalities providing solid waste service	2,915	2,984	3,018	3,020	3,115
% population receiving solid waste service	77	76	77	73	81
% municipal population receiving solid waste service	98	97	97	92	98
Solid waste collected (103 tons/year)	25,134	25,373	26,118	24,237	25,280
Average solid waste per capita (kg/capita-day)	1.31	1.34	1.38	1.34	1.21
<i>Solid Waste Disposal Facility Indicators</i>					
Number of landfills	12	12	15	16	22
Capacity (Thousand tonnes)	261,282	277,195	278,015	278,060	376,974
Waste disposed to these facilities (Thousand tonnes/year)	8,304	7,047	7,432	6,991	9,942
Number of composting facilities	3	4	5	5	4
Capacity (Thousand tonnes)	299	664	667	667	606
Waste disposed to these facilities (Thousand tonnes/year)	218	383	326	349	105
Number of incineration facilities	3	3	3	3	3
Capacity (Thousand tonnes)	44	44	44	44	44
Waste disposed to these facilities (Thousand tonnes /year)	11	9	14	14	28
Source: Turkstat					

According to the latest statistics by Turkstat, 25.3 million tonnes of solid waste was collected and disposed of from the 3,115 municipalities in Turkey in 2006. The 81% of the total population and 98% of the municipal population received solid waste collection services. For 2006, the average daily solid waste per capita was 1.21 kg.

Among the total amount of 25.3 million tons of solid waste collected in 2006 from the municipalities which provide solid waste service, 49% of disposal was to municipal and other municipal dump sites, 37% to landfills, and 10% to metropolitan municipality dump sites; in addition, 1% was composted, 1% was incinerated outdoors and the other 2% was buried and dumped in streams and lakes

Although Turkey does not have sufficient level of disposal facilities, the number of controlled landfill sites and their capacity is rapidly increasing. As of 2006, there were only 22 landfills in Turkey and most of them were in high population provinces. The highest amount of solid waste disposed in these facilities was in Istanbul with 4.5 million tonnes/year in 2006, followed by Ankara with 1.9 million tonnes, and than Izmir with 0.8 million tonnes. There are landfills only in 15 provinces out of 81 provinces in Turkey.

According to the latest industrial waste survey of Turkstat conducted in 2004, the yearly industrial waste volume was around 17.5 million tonnes of which 1.1 million tonnes was hazardous waste. The 8% of industrial waste was recycled and 47% was disposed and 45% was used again. Some of the private sector companies providing waste collection services declared significantly higher volumes of hazardous waste; around 4-5 million tonnes/year.

Future Investments

WASTE SECTOR PUBLIC INVESTMENT NEEDS, 2007-2023									
(Million €)									
	Total	2007	2008	2009	2010	2011	2012	2013	2014-2023
Landfill	7,574	200	245	345	345	345	400	425	5,269
Incineration	1,257	-	-	-	89	89	89	90	900
Packaging	655	-	41	41	40	41	41	41	410
Hazardous waste	74	-	-	-	4	4	4	5	57
Total	9,560	200	286	386	478	479	534	561	6,636
<i>Source: MoEF, UCES</i>									

In the 2006 strategy paper, the MoEF forecasts €9.5 billion of public investment in the waste sector between 2007 and 2023.¹³ The recent statistics by the MoEF show that the number of landfills increased significantly from 22 units in 2006 and to 34 facilities in 2008. By the end of 2012, the MoEF targets to increase the number of controlled landfill sites to 130 to serve a population of 57 million in 1,130 municipalities. This

¹³ UCES (2006)

means that around 100 new landfills will be established in Turkey between 2009 and 2023.

The MoEF is planning to invest in the development of five regional hazardous waste storage and disposal facilities between 2010 and 2023. The facilities will be in Thrace, Marmara, Aegean, Central Anatolia and East Mediterranean regions. The controlled storage facilities will cost approximately €30 million, the incineration facilities will cost €80 million and each transfer station will cost €1million. These projects are planned to be realized through Built and Operate (BO) investment method.

In addition to public investments there would be large size investments by the private sector especially for disposal of industrial and hazardous waste. One of the largest investments in the area will be in Izmit-Gebze. As a joint venture of Gebze Chemicals OIZ, Anelmak, Union of Chemicals, Petrochemicals, Plastics and Rubber Industrialists' (Kiplas) and Diler Iron & Steel a new industrial waste incineration facility will be established. The facility will have 48,000 tonnes /year capacity and cost around \$70 million. The company was established in mid-2007 and the facility is expected to start operation by the beginning of 2010. The partner Anelmak will be technology supplier of the facility and plasma technology will be used in the facility. The name of the facility will be Kiplasma and it will also generate electricity.

Erksan-Suez is planning to invest in two 50,000-tonnes capacity industrial waste storage facilities in Konya and Kocaeli. The investment will cost €2 million and will start operation in June 2009.

There are several project development plans also in the Izmir region. One of the projects is for the establishment of an integrated incineration facility in Aliaga OIZ. The project is developed by Adventus Development (the USA). The project will draw upon the industrial waste generated by companies in Aegean region's industrial zones and is expected to start operation in late 2009. The investment cost of the project is estimated around \$45 million. The facility will also generate electricity. The project is currently at development stage.

Another project is developed by ZincOx (UK). The company developed a project for the production of 20,000 tonnes per annum high quality zinc oxide generated from the electric arc furnace dust generated by the steel mills at Aliaga. The project could not yet receive the environmental approval from the MoEF.

Major companies in waste sector

Most of the advanced and integrated solid waste disposal facilities belong to municipalities. The number of municipal composting facilities is only four and only three of them are operating. These are in Antalya, Istanbul and Izmir and all are operated by municipality companies. The largest one is in Istanbul and belongs to Istac (Istanbul Greater City Municipality Waste Management Company).

There is a significant gap between the demand for and the availability of hazardous waste incineration facilities in Turkey. Currently, Izaydas is the only licensed hazardous waste incineration facility. Total yearly capacity of Izaydas is 35,000 tonnes and it has been working at full capacity since 2006. It cannot accept additional hazardous and medical waste before 2017.

There are nine medical waste sterilization facilities and one medical waste incineration facility as well as 53 medical waste transportation licence holders serving with 206 vehicles in Turkey. Istac is the only facility serving for the incineration of medical waste. The volume of medical waste in Turkey is estimated around 92,000 tonnes as of end 2007. Approximately 55% of the medical waste was not disposed properly; mixed with house waste, incinerated at open-air etc. The MoEF targets to dispose at least 85% of the medical waste in parallel to the EU directives before 2013.

In addition to the above municipal facilities Petkim (Izmir) and Tupras Refinery (Izmit) has incineration facilities serving mostly for their in-house hazardous waste. The capacity of Petkim is 17,500 tonnes/year and it can provide third party service for 10,000 tonnes/year. Tupras has 7,500 tonnes /year capacity but cannot provide any service to other industrial companies.

There is also a small number of private sector companies providing professional services in the area of waste collection and disposal. Erksan Cevre Teknolojileri (Erksan-Suez) is one of the leading private companies in the sector. The company is the exclusive partner of Sita-Deutschland/Suez, one of the leading environment and energy groups in the world. The company provides services for waste management, storage, export, disposal and recycling in Turkey. As of 2008, the company collects industrial waste of 50 companies amounting around 5,500 tonnes/year and targets to reach 30,000 tonnes/year. Some of the collected industrial waste is exported to the disposal facilities in the EU and some are incinerated at the cement factories of Oyak and Akcansa. The company has 11 regional offices (partners). Its revenue was €4 million in 2008 and is expected to reach € 9 million in 2009.

Chimirec (France)-Ekesan is another company licenced for the collection and disposal of industrial and hazardous waste in Turkey. The company has two storage areas in Gebze/Kocaeli and Ankara and provides services for collection of lubricants and oils, accumulators, transformer as well as hazardous industrial wastes.

Serdar Engineering is another major private company active in waste sector. The company has licences in hazardous waste collection and storage as well as transportation. Serdar Muhendislik is interested developing an industrial waste elimination facility in Aegean region.

The MoEF allows for the incineration of high calorific solid and liquid waste such as lubricants, tyres, paint waste and plastics as alternative and/or additional fuel in cement factories. There are 33 cement factories who received licenses for using industrial and hazardous waste as alternative fuel. This service started to become popular by the industry as used by Erksan-Suez type private waste management companies.

As of April 2009, there are 135 companies with licences related to hazardous waste collection, recycling and incineration. There are 777 companies with licenses for hazardous waste transportation.

In solid waste collection and disposal equipment, there are more than 100 companies in Turkey. There are significant amount of local companies producing bin washing equipment, containers, conveyors, waste collection equipment, transfer vehicle, etc. There is also a small number of representatives of foreign companies.

Efe Endustri, Hidro-mak, Imot Makina Insaat, Mass Aritma, Mogal Makina, Orakci Makina are the major domestic urban waste equipment manufacturers in Turkey.

In urban solid waste collecting, EMS Makine is a major company distributing equipment of four Italian companies in Turkey including:

- Ziliani Carlo Srl (bin washing equipment, compactors, conveyor belts, long compactors, semi trailers, skip loaders etc)
- ISAL Srl (power sweepers)
- Unieco Srl and Mac Srl (leaf collection equipment)
- Modena Srl (wet dry floor, surface cleaning and drying)

Tatmak-Karyer is another important distributor in waste equipment, representing waste compactors of Bomag (Fayat Groupe –France), city cleaning equipment, sweepers of Dulevo (Italy) and sweeping machines of Comac (Italy).

Seven Cevre Teknolojileri represents various brands including Vezzani (Italy) in steel scrap processing machines. However the company's main business is distribution of the equipment of Komptech and Wilibald (Germany) and Presona AB (Switzerland).

In the segment of geo-membranes and geo-textiles for landfills, there is a local manufacturer with production facility in Ankara but the market is dominated by foreign brands especially from Austria, Germany, Spain and the UK. Troser distributes Sotrafa (Spain) and Sams distributes Linteco (Austria) and Poyfelt (Germany).

In compost machine and plants and waste separation plants, the most important distributor is Envirochem Cevre Teknolojileri representing various companies from Germany, Spain, the USA and the UK.

2.2.4 Recycling

Sector overview

According to latest detailed statistics by the MoEF, around 1.2 million tonnes of packaging waste was supplied in Turkey by the 1,705 officially recorded suppliers in 2006. The target recycling rate was between 30 to 35%.The recycling volumes are below the target in plastic and composite packaging. For all other products Turkey recycled more than the target rate. The average recycling rate was 114% in 2006 because of over recycling in paper and cardboard possibly due to less declaration of suppliers.

RECYCLING OF PACKAGING WASTE IN TURKEY, 2006

Packaging Type	Production of Packaging Material (Tonnes)	Packaging Supply (Tonnes)	Target Recycling Share	Recycled Volume (Tonnes)	Realization Share
Plastic	326,548	298,123	35%	86,624	29%
Metal	157,103	108,710	33%	85,244	78%
Paper and Cardboard	1,224,626	464,263	30%	1,075,365	232%
Glass	302,706	265,091	33%	90,770	34%
Composite	19,884	38,265	33%	3,432	9%
Total	2,030,867	1,174,452	33%	1,341,435	114%

Source: MoEF

Major companies in the Sector

“The Directive on Packaging and Packaging Wastes” assigns certain responsibilities to the companies marketing packaged products for the recycling expenses. The number of companies supplying packaged goods increased from 890 in 2005 to 4,500 as of end-2008. According to the Directive, the packaging wastes have to be collected and recycled by licensed companies. The licensing started in 2003. The licensing authority is the General Directorate of Waste Management. 250 companies have been licensed in total either for collection and separation or for recycling of packaging waste as of April 2009. Most of the recycling companies are located in industrialised cities; Istanbul accounted 15% of the existing companies followed by Bursa and Izmir.

RECYCLING COMPANIES WITH LICENCE, 2009

	No of Companies	Share
Istanbul	38	15%
Bursa	25	10%
Izmir	24	10%
Kocaeli	18	7%
Antalya	15	6%
Tekirdag	14	6%
Ankara	13	5%
Mersin	10	4%
Eskisehir	7	3%
Adana	6	2%
Others	80	32%
Total	250	100%

Source: MoEF

The majority of the recycling companies are active in all types of products including glass, plastic, metal, paper and composite. The next biggest group is specialised only in recycling of plastics, followed by paper recycling.

RECYCLING COMPANIES BY TYPE OF RECYCLED PRODUCTS, 2009

	Product Type	Share
Glass, plastic, metal, paper, composite	142	56.8%
Plastic	68	27.2%
Paper	23	9.2%
Glass	7	2.8%
Aluminium	2	0.8%
Composite	2	0.8%
Others	6	2.4%
Total	250	100.0%

Source: MoEF

As of April 2009, there are 20 waste lubricant collection and recycling companies in Turkey. The Association of Petroleum Product Distributors (Petder) is the largest licensed organisation for collecting the waste lubricants nationally. In 2007, the volume of waste lubricants and oils recycled under license was 37,551 tonnes and Petder collected around 50% of this. However this amount accounted only 20% of the total lubricants consumption in Turkey. Before 2013, the MoEF targets to reach a recycling rate of 40-45% in lubricants.

Another major waste collected and recycled was vegetable oil. In 2007, 3,000 tonnes of used vegetable oil and 90,000 tonnes vegetable oil refinery waste was collected. As of 2008, major municipalities started to conduct plans for collection of used vegetable oil from hotels, restaurants and households. There are seven private companies collecting used vegetable oil and the largest ones are Ezici Yag Sanayi and Kolza Biodizel. In addition, there are 14 companies having licence for collecting vegetable oil refinery waste.

In 2007, 43,000 tonnes of accumulator was collected and recycled in Turkey. As of April 2009, there are 14 companies having licence for accumulator recycling and 88 licensed vehicles provide transportation services for collecting waste accumulators.

There are five companies authorized for recycling of electronic waste. The largest ones are Exitcom Recycling for Future and Doga Entegre Geri Donusum.

The estimated number of waste tyres was 200,000 units per year in Turkey. The recycling of waste tyres and their utilisation as alternative fuel in cement factories is possible. As of April 2009, there are 14 companies with licence for storing and seven companies with licence for recycling of used tyres.

2.3 INVESTMENTS: GOVERNMENT & MUNICIPAL BUDGET

Total government and municipal investment expenditures for the environment sector increased from €963 million in 2003 to €2.4 billion in 2007. In 2008, it is expected to realise around €2.5 billion. The majority of the investments are by municipalities accounting for 79% of public investment expenditures in 2007, followed by central government investments. Investments through Bank of Provinces accounted only 3% of the total investments in 2007.

ENVIRONMENTAL INVESTMENT EXPENDITURES IN TURKEY, 2003-2007 (€ Million)					
	2003	2004	2005	2006	2007
Public Investments, all	909	1,009	1,214	1,609	2,439
<i>Municipal investments</i>	570	705	711	1,167	1,920
<i>Central administration (1)</i>	338	303	435	368	457
<i>Bank of Provinces</i>	<i>n.a.</i>	<i>n.a.</i>	68	74	63
Private sector investments (2)	55	60	76	96	138
Total investment expenditures	963	1,068	1,290	1,705	2,578
<i>Share in GDP</i>	0.4%	0.3%	0.3%	0.4%	0.5%

(1) Including investment expenditures through Bank of Provinces for 2003 and 2004;
(2) IBS estimates between 2003 and 2006
Source: Turkstat and MoEF

The water sector attracted majority of investments between 2005 and 2007, accounting for 80% in 2007, followed by nature protection and solid waste investments.

PUBLIC ENVIRONMENTAL INVESTMENTS BY SECTORS, 2005-2007 (€ Million)			
	2005	2006	2007
Water & Soil	707	1,182	1,963
<i>Water</i>	246	509	1,185
<i>Wastewater</i>	459	671	773
<i>Soil and groundwater</i>	2	2	4
Nature protection	51	62	169
Solid waste	2	73	102
Energy	0	1	5
R&D	3	1	2
Air	0	0	1
Noise	0	0	0
Others (1)	452	290	198
Total public investment expenditures	1,214	1,609	2,439

(1) Expenditures those are not possible to separate under above categories.
Source: Turkstat

According to the decision by the screening report for the environment sector, the MoEF prepared a strategy paper for the EU environmental adaptation process.¹⁴ The UCES includes a plan for the transposition, implementation and enforcement of the EU environmental acquis, as well as an estimation of related costs. The MoEF expected €58.6 billion investment between 2007 and 2023. The investment requirements presented in detail below did not include noise and chemicals sector because the studies for these sectors have not been completed yet.¹⁵ The EU harmonization cost did not include investment expenses related packaging wastes. The largest investment demand is expected to be for water sector and followed by industrial pollution.

INVESTMENT NEEDED FOR EU ENVIRONMENTAL ADAPTATION, 2007-2023		
	Investment Demand	
	€ Million	Share
Water	33,969	58
Waste	9,560	16
Air	37	0.06
Industrial pollution	14,755	26
Protection of nature	264	0.4
Total	58,585	100
<i>Source: MoEF, UCES</i>		

The breakdown of funding for the EU environmental harmonization process would be as in the following table. Local administrations will be the largest investors for the adaptation process followed by the private sector.

FUNDING FOR THE EU ENVIRONMENTAL ADAPTATION, 2007-2023						
	2007-23		Short-term			
	€ Million	Share	2009	2010	2011	2012
Central administration	14,378	13	330	347	364	382
Local administration	40,530	37	1,423	1,533	1,189	1,221
<i>Municipal resources</i>	24,196	22	966	1,117	741	772
<i>Bank of Provinces* credits</i>	12,970	12	313	323	344	350
<i>External credits</i>	994	2	115	83	71	61
<i>PPP (BO and BOT)*</i>	817	1	30	30	34	38
Private sector	15,138	26	581	612	648	690
State Economic Enterprises (SEE)	1,187	2	38	46	57	62
Funds (EU and other donation)	12,708	22	80	102	508	558
Total	58,585	100	2,452	2,660	2,766	2,913
* Public Private Partnership (PPP) such as Build Operate (BO) and Build Operate Transfer (BOT)						
<i>Source: MoEF, UCES</i>						

¹⁴ UCES (2006)

¹⁵ Akca, Lutfi Prof. Dr., EU Compatible Environmental Management, Water & Environmental Technologies Turkey, Volume 2, Istanbul, 2009, P.12-18.

In the short term, the investment is expected to be around €2.5-3.0 billion per annum. Although UCES expected a jump in private sector investments by 2009, due to the global economic recession IBS expects at least one to two years of delay.

After 12 years of negotiations, in February 2009 Turkish Parliament ratified Kyoto Protocol. This will lead to enactment of several measures for all sectors in order to reduce carbon emissions but as the experts and the MoEF underline, there will be no cost burden before 2012. The Ministry expects the necessary investment and expenses for decreasing the carbon emissions in Turkey in line with the Kyoto Protocol is probably going to add extra costs to the EU adaptation investments as calculated by the UCES.

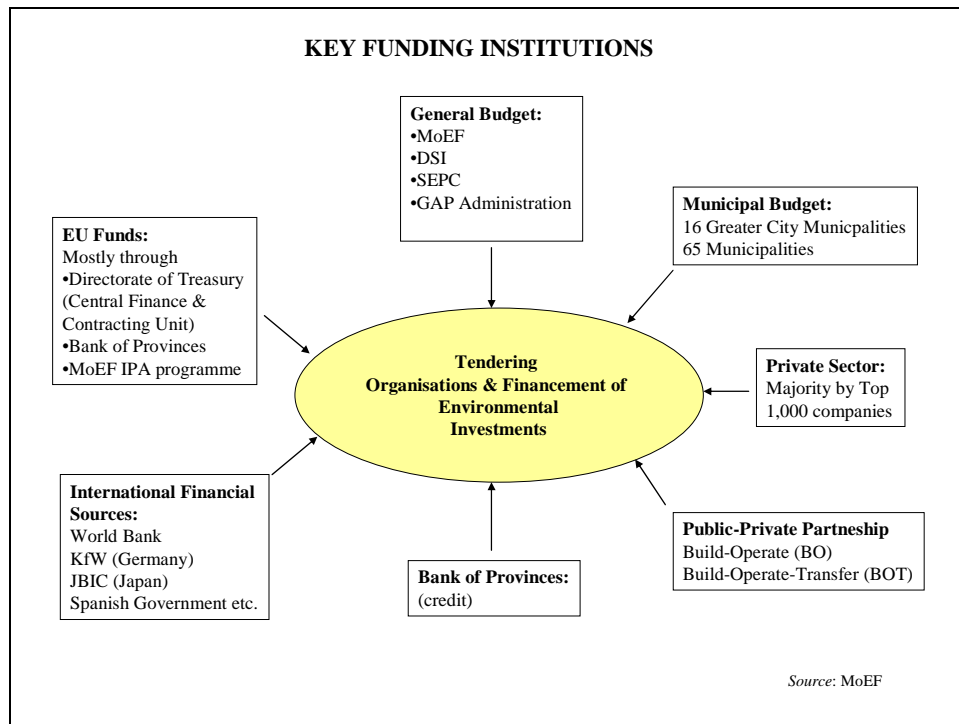
2.4 LOCAL TENDERS & TENDERING INSTITUTIONS

There are seven main sources for financing environmental investments and expenditures in Turkey.

The largest financing source is local administrations including 16 Water and Sewerage Administrations belonging either to the Greater City municipalities, the 65 provincial municipalities or the around 3,000 smaller municipalities. The main source of finance for the local administrations has been their own sources and their share from the general budget of tax revenues. In addition, these municipalities use the credit loans of the Bank of Provinces itself, the EU or other international funds through the Bank of Provinces as well as financial sources of other central governmental organisations. In local level in addition to the municipalities, the Special Provincial Administrations (responsible for infrastructure investments of villages and small districts in provinces) are important investment bodies.

Other than local administrative institutions, the state economic enterprises (SEE), managements of Organized Industrial Zones and industrial plants of the private sector are the key customer groups.

The State Water Works (DSI) is the key central government tendering body especially dominant in supply of drinking water and construction of dams, etc. In addition to DSI, the State Highways General Directorate, the General Directorate of Railways, Harbours and Airport Construction, the Turkish Pipeline Corporation (BOTAS) and the South Eastern Anatolia Project Administration (GAP Administration) have less prominent roles in environmental projects.



The EU funds are coordinated through the General Directorate of Treasury's Central Finance and Contracting Unit in contact with the Secretariat General for the EU Affairs (EUSG). In addition, the MoEF IPA programme and Bank of Provinces are key authorities for distribution of the EU funds in Turkey.

The most important international financial sources are the World Bank, KfW and JBIC as well as some EU government programmes such as that of the Spanish government. The Bank of Provinces and MoEF as well as DSI are key authorities for the coordination of these financial sources. In several cases, these resources are used directly by the municipalities. The Industrial Development Bank of Turkey (TSKB) is a key financial institution providing credit for environment sector projects in corporation with its loan partners, such as IBRD, EIB, AFD, KfW and CEB

Within the private sector, most of the environmental activity originates from the top thousand industrial companies of Turkey -which is announced by Istanbul Chamber of Industry every September- as well as the Organized Industrial Zones. The municipalities and DSI have also developed some public-private partnership projects in the form of Build-Operate (BO) and Build-Operate and Transfer (BOT) models.

Water and Sewerage Administrations of the 16 greater city municipalities of the most populated and industrialised cities comprise the key group in Turkey awarding tenders. These major municipality entities are as follows:

GREATER MUNICIPALITIES' WATER & SEWERAGE ENTITIES

Name of the Company	Budget, Million TL (Year)
Istanbul Water & Sewerage Administration (ISKI)	1,679 (2009)
Ankara Water & Sewerage Administration (ASKI)	1,221 (2009)
Izmir Water & Sewerage Administration (IZSU)	1,160 (2009)
Kocaeli Water & Sewerage Administration (USI)	296 (2009)
Bursa Water & Sewerage Administration (BUSKI)	285 (2009)
Mersin Water & Sewerage Administration (MESIT)	190 (2009)
Konya Water & Sewerage Administration (KOSKI)	152 (2008)
Antalya Water & Sewerage Administration (ASAT)	140 (2007)
Eskisehir Water & Sewerage Administration (ESIT)	127 (2008)
Adana Water & Sewerage Administration (ASKI)	123 (2007)
Samsun Water & Sewerage Administration (AASKI)	108 (2008)
Gaziantep Water & Sewerage Administration (GASKI)	94 (2007)
Adapazari Water & Sewerage Administration (ADASU)	93 (2009)
Kayseri Water & Sewerage Administration (KASKI)	76 (2008)
Erzurum Water & Sewerage Administration (ESKI)	n.a.
Diyarbakir Water & Sewerage Administration (DASKI)	n.a.

Source: IBS field research

The budgets of ISKI, ASKI and IZSU are considerably higher than those of the others due to the size of population they serve.

2.5 MAJOR RECENT / UPCOMING PROJECTS

IBS expects the public environmental investment expenditures in 2008 to total around €2.3 billion. Of this, drinking water projects would get the lion's share with 73% (€1.7 billion), followed by waste water projects with 21%. In 2009, IBS expects a slow down and investment to total €1 billion: this is in line with the 2009 Investment Programme. The largest decrease is expected to be in drinking water projects. The air sector investments are likely to shrink significantly as well, due to the finalisation of major flue gas desulphurisation projects of state thermal power plants. There will be small increases in investment expenditures for waste water, solid waste and nature protection.

PUBLIC SECTOR ENVIRONMENT INVESTMENTS, 2008-2009 (‘000 €)		
	2008 expenses (1)	2009 Expenses (2)
Drinking water	1,691,216	349,335
Wastewater	473,073	501,035
Waste sector	48,039	68,766
Nature protection	3,088	7,037
Air sector	87,267	3,281
Total	2,302,683	929,453
(1) Estimates; (2) plan		
Source: SPO		

The ten largest projects in *drinking water* segment will be the following projects:

TOP TEN PUBLIC SECTOR DRINKING PROJECTS IN 2009, (‘000 €)				
	Funding Organisation	2008	2009	Financial Source
Istanbul Buyuk Melen 2 nd Stage	DSI	1,133,370	70,134	Own funds
37 projects (for Municipalities less than 3,000 population)	Bank of Provinces	0	45,627	Own funds
Mersin drinking water	Bank of Provinces	4,950	20,612	World Bank
Antalya drinking water	Bank of Provinces	15,719	16,540	World Bank
Siirt (Urgent) drinking water	DSI	17,178	16,000	Own funds
Aydin/Ortaklar drinking water	DSI	51,280	13,911	Own funds
Izmir drinking water 2 nd Stage	DSI	85,248	13,150	Own funds
Trabzon drinking water	DSI	93,794	8,767	Own funds
Denizli drinking water	Bank of Provinces	1,260	8,522	Own funds
Cankiri drinking water	DSI	22,750	6,575	Own funds
Top 10 total		1,427,558	221,848	
Drinking water projects total		1,691,216	349,335	
Share of Top 10		84%	64%	
Source: SPO				

The ten largest projects in *waste water* segment will be as in the below table. The largest project is by the Bank of Provinces for the development of sewerage networks of 79 small towns and districts. The largest independent project in wastewater is BUSKI's wastewater treatment plant and sewerage network project. The financing of the project was by BUSKI and majority of the expenses will be within 2009.

TOP TEN PUBLIC SECTOR WASTEWATER PROJECTS IN 2009, ('000 €)				
	Funding Organisation	2008	2009	Financial Source
79 sewerage network projects	Bank of Provinces	38,867	94,944	Own funds
Bursa, network & treatment	BUSKI	27,757	61,066	Own funds
Antalya treatment plant	Bank of Provinces	6,299	59,477	World Bank
MESKI network & treatment	MESKI	94,929	29,978	Own funds
SASKI network & treatment	SASKI	42,613	25,925	Own funds
13 Earthquake region projects	Bank of Provinces	38,238	21,230	Foreign finance
Denizli sewerage network	Bank of Provinces	1,155	19,189	World Bank
Eskisehir network & treatment	ESKI	22,794	17,250	Own funds
Zonguldak network & treatment	Zonguldak Mun.	2,102	16,184	Own funds
Mugla treatment plant	Bank of Provinces	5,426	15,589	Own funds
Top 10 total		280,180	360,832	
Waste water projects total		473,073	501,035	
Share of Top 10		59%	72%	

Source: SPO

The top five largest projects in *waste* segment will be as follows. All of the solid waste projects are financed by the EU and the responsible governmental body for the financing of these projects is the MoEF. The largest project is Kusadasi region project with €15 million to be spent in 2009.

TOP FIVE PUBLIC SECTOR WASTE PROJECTS IN 2009, ('000 €)				
	Funding Organisation	2008	2009	Financial Source
Kusadasi region solid waste	MoEF	13,172	15,152	EU
Canakkale region solid waste	MoEF	13,036	10,285	EU
Municipality of Istanbul, Eight sea cleaning vehicles	MoEF	0	7,428	EU
Amasya region solid waste	MoEF	0	4,284	EU
Municipality of Samsun, solid waste	MoEF	0	3,873	Foreign loan
Top 5 total		26,208	41,022	
Solid waste projects total		48,039	68,766	
Share of Top 5		55%	60%	

Source: SPO

In nature protection, there are various planning and research studies carried out by the MoEF. In air sector, there are projects of the Turkish Sugar Factories in progress.

A full list of the 2008 and 2009 public investment projects is available in Annex 2. Additionally, a selected list of the major tender results between January 2008 and April 2009 and the awarded companies are also listed in Annex 3.

2.6 ENVIRONMENTAL LEGISLATION & EXPECTED CHANGES

As underlined in the OECD 2008 “Environmental Performance Review” of Turkey, the Turkish environmental legal framework is now stronger and closer to the EU environmental *acquis communautaire*. Especially with the comprehensive legislative amendments of the 1983 “*Law on Environment*” in 2006, the legislative framework became more powerful and effective. This amendment included:

- Prominent participatory and precautionary approaches including the polluter-and user-pays principles,
- Opening up possibilities for greater use of economic instruments,
- Firm environmental liabilities,
- Improved public access to environmental information,
- Stricter requirements for municipalities to prepare detailed land use plans and plans for the construction of domestic solid waste treatment facilities, and
- Higher sanctions for non-compliance with environmental legislation

As of 2009, Turkey ratified the Kyoto Protocol but has not yet become party to the Espoo or Aarhus Conventions. Currently, the regulations concerning packaging waste are completely in compliance with the EU *acquis*. There are still some areas harmonisation and improvement as underlined in the EU Progress report of 2008. These can be summarized as follows:

- Procedures for environmental consulting/The public and trans-boundary consultations have to be developed and defined more precisely.
- The framework for emission trading has to be drafted and harmonised with the EU directive.
- In air sector, necessary adaptations have to be made on emissions of volatile organic compounds and on sulphur content of certain liquid fuels as well as on national emission limits.
- In waste management, Turkey needs a national waste management plan, to harmonise its regulations related with directives on landfills, and more progress on end-of-life vehicles and waste electrical and electronic equipment.
- In water management, the progress is limited. The framework for water management has to be organised on a river basin basis and the trans-boundary consultations have to be done on water issues.
- The progress in nature protection is limited. The regulatory framework for the establishment and management of zoos is missing. The list of potential Natura 2000 sites has not been finalized yet. The regulatory framework for the protection of birds and habitats is missing. There is need for a national biodiversity strategy.

- Although some regulatory improvement has taken place in industrial pollution control, the implementation of Seveso II Directive and Large Combustion Plants and Waste Incineration Directives remain very low.
- Although the legislation on dangerous chemicals has been amended, the implementation of the legislation is not sufficient.
- There no progress in genetically modified organisms, and in the field of noise.

The following list presents a complete list of the laws and regulations.

SELECTED ENVIRONMENTAL LAWS & REGULATIONS, 2008		
GENERAL	First enacted	Last ordinance
Law on Environment No. 2872	1983	2006
Law on Energy Efficiency	2007	
Law on Geothermal Energy	2007	
Law on Nuclear Energy	2007	
Law on the Use of Renewable Energy Resources for Electricity Production Purposes No. 5346	2005	
Law of Organic Agriculture	2004	
Law on Municipalities No. 5393	2004	
Penal Code	2004	2006
Law on Local Government Associations		
Law on Metropolitan Municipalities No. 5216	2004	2005
Regulation on the Basis and Procedures of the Implementation of the Law on the Right Access to Information No. 18132	2004	2005
Regulation on Environmental Inspection No. 24631/bis	2002	
Regulation on Soil Pollution Control	2001	2005
Regulation on Organic Agriculture	1994	
Regulation on Environmental Impact Assessment No. 25318	1993	2004
Law on the Organisation and Responsibilities of the Ministry of Environment and Forestry No. 4856	1991	2003
Law on Mining	1985	2004
Law on the Procedure of Administrative Justice No. 2577	1982	
Law on the Organisation and Responsibilities of the State Hydraulic Works	1953	
Law on Sea Ports	1925	
AIR		
Regulation on the Control of Air Pollution from Heating No. 25699	2005	
Regulation on Petrol and Diesel Fuel Quality No. 25489	2004	
Regulation on Informing Consumers on Fuel Economy and CO2 Emissions of New Passenger Cars No. 25530	2003	
Regulation on the Control of Exhaust Gas Emissions caused by Motor Vehicles	1993	
Regulation on Protection of Air Quality No. 19269	1986	
WASTE		
Regulation on End-of-Life Tyres	2006	
Regulation on Hazardous Waste Control No. 25755	2005	
Regulation on Medical Waste No. 25883	2005	
Regulation on Waste Vegetable Oil Control No. 25791	2005	
Regulation on Packaging and Packaging Waste Control No. 25538	2004	2007
Regulation on Waste Oil Control No. 25353	2004	
Regulation on Waste Batteries and Accumulators Control No. 25538	2004	2005
Regulation on the Recovery and Control of Ship Waste No. 25682	2004	
<i>Continues .../...</i>		

.../....		
	First enacted	Last ordinance
Regulation on the Control of Excavation Soil, Construction Waste and Wreckage No. 25406	2004	
Regulation on Solid Waste Control No. 20814	1991	2005
WATER		
Regulation on Bathing Water Quality No. 26048	2006	
Regulation on Urban Waste Water Treatment No. 26047	2006	
Regulation on the Control and Reduction of Water Pollution Caused by Discharge of Certain Dangerous Substances No. 26005	2005	
Regulation on the Quality Required of Surface Water Intended for the Abstraction of Drinking Water No. 25999	2005	
Regulation on Water Intended for Human Consumption No. 25730	2005	
Regulation on the Protection of Waters against Pollution Caused by Nitrates from Agricultural Sources No. 25377	2004	
Law on Fisheries No. 1830	1995	2006
Regulation on Fisheries No. 22223	1995	2006
Regulation on Water Pollution Control No. 25687	1988	2004
Law on Underground Waters No. 167	1960	
Law on Geothermal and Natural Mineral Waters	1926	2007
NATURE		
Regulation on Keeping, Breeding and Trade of Game and Wild Animals and the Products Obtained from Them No. 258472005	2005	
Regulation on Hunting and Wild Animals and Production Facilities and Stations and Rescuing Centres No. 25656	2004	
Law on Hunting No. 4915	2003	
Regulation on the Conservation of Wetlands No. 25818	2002	
Law on Reforestation and Soil Erosion Control	1995	
Law on National Parks No. 2873	1983	
Law on Preservation of Cultural and Natural Entities No. 2863	1983	
Law on Forestry No. 6831	1956	1986
INDUSTRIAL POLLUTION AND RISK MANAGEMENT		
Regulation on Control of Air Pollution from Industrial Plants No. 26236	2006	
Law on Organised Industrial Regions	2002	
CHEMICALS		
Regulation on the Working Principle and Procedures of Ethical Councils Concerning Animal Experiments No. 26220	2006	
Regulation on the Protection of Experimental Animals and on the Basic Principles of the Establishment, Operation and Inspection of Experimental Laboratories	2004	
Regulation on the Phase-Out of Ozone Depleting Substances No. 23766	1999	2006
Regulation on Dangerous Chemicals No. 21634	1993	2001
NOISE		
Regulation on Environmental Noise and Management No. 25862	2005	2008
<i>Source: OECD (2008)</i>		

2.7 OPPORTUNITIES FOR ITALIAN COMPANIES

The Turkish environment technologies and services market is largely untapped and offers a wealth of opportunities for Italian companies, especially for large-scale public and industrial projects that require advanced environmental technologies where local companies do not have the organisational capacity and for projects where foreign financing is necessary.

As detailed in Section 2.3, Turkey needs to spend a minimum of €58.5 billion between 2007 and 2023 for the EU environmental harmonization programme, and yearly €2.5 to €3.0 billion between 2009 and 2012 for the improvement of the environment. The majority of the funding will be through local administrations. For that reason, following the tenders of the 16 Greater City Municipalities as well as the projects of the Bank of Provinces is crucial for environment sector companies. Water and solid waste sectors will be the key investment areas in the future.

In the 1980s, Turkey started to use the turnkey method as a means of financing infrastructure investments including in environment. With the advent of this, well-financed foreign contractors and engineering companies obtained a clear advantage over their Turkish counterparts in winning public tenders. Projects won by foreign companies became captured markets for foreign consultants and equipment producers. EMIT SpA and Culligan Italiana cases (mentioned in Section 2.2.2) are excellent examples of this trend.

IBS suggests Italian companies establish a registered company or a joint venture and work closely with a local partner which could create an important advantage in marketing and cost minimisation. This is also regarded as an asset and appreciated by the Turkish end-user of consultant services for three reasons:

- Designs prepared abroad have to be adapted to local conditions incorporating local data;
- Project owners like to keep in touch with the consultants even after the project is over;
- A permanent office is useful for marketing purposes.

Consultancy firms should also establish strategic alliances with local consultancy companies, in order to further tap the market and/or approach the prime contractors, industrial investors and public agents, who are the main clients for consultancy services.

In terms of project development, Italian companies need to be more proactive according to the interviews IBS carried out with several engineering firms. Domestic engineering companies underlined that companies from Germany, France, and the Netherlands are more active, especially in projects funded by the EU and other international bodies.

As the market develops, there will be an increasing demand for high tech products. Many local firms in Turkey have already collaborated with foreign companies in an

effort to promote new products and services, including advanced biological treatment, membrane technology, bacterial treatment and electro-deionization.

Water, wastewater and solid waste treatment systems offer opportunities especially in three aspects:

- Although these systems primarily comprise customised systems design and installation by local firms, Turkey must still import the more advanced variety including air filtration and purifying machinery, blowers, diffusers, dust collectors, low and high capacity pumps, transportation-handling and transfer equipment and incinerators.
- Provision of operation and maintenance services to water, wastewater and solid waste facilities is an emerging market and local companies are interested in cooperating with foreign companies.
- Cooperation in specialised technologies such as treatment of chemical pollutions, heavy greases, solvents and refinery wastes is among areas where Turkish firms are interested in.

As the underground water is increasingly used up over time in the Aegean, East Anatolia and South East Anatolia regions, advanced purifying processes have become essential. In these regions, the ratio of arsenic in drinking water is very high. There will be new investments for arsenic treatment facilities after Izmir and Aksaray-Nigde-Nevsehir projects.

Recovery and recycling is also another untapped market segment offering broad opportunities. Currently, there is intense competition in but lack of advanced technologies in Turkey.

It is almost essential for companies to supply financing as well as technology and services, in particular when applying for state tenders. Firms that provide financial packages along with their bids have a better chance of securing business. Unlike in many other countries, municipalities in Turkey do not issue municipal bonds to fund construction projects and are still highly dependent on funds derived from national sources. Major infrastructure projects are funded either by international financial institutions or supplier credits. In that respect, German, Spanish, Japan companies and governments are more active compared with their Italian counterparts.

The sector companies underline that the Italian equipment and engineering companies have opportunities especially for large size infrastructure and industrial projects due the need for advanced technologies and engineering, because in such systems the quality of the solutions become more critical. In small size residential, tourism sector and industrial projects, due to their higher prices, US and EU originated (thus Italian originated) equipment have limited chances as compared with their Far Eastern competitors. For that reason, a key area of competition for Italian companies is large scale projects as well as projects that require advanced technologies and solutions.

Italian companies can also benefit by cooperating with Turkish contractors to develop projects in countries other than Turkey such as Russia, CIS and Middle East countries, where Turkish contractors have well rooted and wide ranging activities.

III KEY CONTACTS, JOURNALS & FAIRS

3.1 KEY SECTOR CONTACTS

Government Organisations

MINISTRY OF ENVIRONMENT & FORESTRY (MoEF)

Sogutozu Cad. No:14/E
Sogutozu 06560, Ankara
Tel: 0312 207 5050
Web page: www.cevreorman.gov.tr

MoEF – ENVIRONMENTAL PROTECTION AGENCY FOR SPECIAL AREAS

Alparslan Turkes Cad. 31. Sok. No:10
Bestepe 06510, Ankara
Tel: 0312 222 1234 Fax: 0312 222 2661
Web page: www.ockkb.gov.tr/TR/

MoEF – GENERAL DIRECTORATE OF ENVIRONMENTAL IMPACT ASSESSMENT & PLANNING

Sogutozu Cad. No:14/E Kat:17
Sogutozu 06560, Ankara
Tel: 0312 207 5000 Fax: 0312 207 6151
Web page: www.cedgm.gov.tr

MoEF – WASTE MANAGEMENT AGENCY

Sogutozu Cad. No:14/E
Sogutozu 06560, Ankara
Tel: 0312 207 5000 Fax: 0312 207 6151
Web page: www.atikyonetimi.cevreorman.gov.tr

BANK OF PROVINCES (ILLER BANKASI GENEL MUDURLUGU)

Ataturk Bulvari 21/A 06053 Opera, Ankara
Yeni Ziraat Mah. 14. Sok. No:14 Diskapi Ankara
Tel: 0312 508 7020 Fax: 0312 311 7217
Web-page: www.ilbank.gov.tr

STATE WATER WORKS (DSI - DEVLET SU ISLARI GENEL MUDURLUGU)

Ismet Inonu Bulvari,
Yucetepe, 06100, Ankara
Tel: 0312 417 8300 Fax: 0312 418 2498
Web page: www.dsi.gov.tr

STATE PLANNING ORGANIZATION (DEVLET PLANLAMA TESKILATI)

General Directorate of Social Planning

Municipalities' Investments Department

Necatibey Cad. No:108

Yucetepe 06100 - Ankara

Tel: 0312 294 5050

Web page: www.dpt.gov.tr

UNDERSECRETARIAT FOR FOREIGN TRADE

General Directorate of Imports

Ismet Inonu Bulvari

06510 Emek, Ankara

Tel: 0312 204 7500

Web page: www.dtm.gov.tr

UNDERSECRETARIAT FOR TREASURY

General Directorate of Foreign Economic Relations

Ismet Inonu Bulvari

06510 Emek, Ankara

Tel: 0312 204 6060

Web page: www.treasury.gov.tr

Non-Governmental Organisations

ASSOCIATION OF ACCUMULATOR & RECYCLING INDUSTRIALISTS (AKUDER)

Merter Meridyen Is Merkezi Ali Riza Gurcan Cad. Cirpi Yolu No:1 K:5 No:505

Tozkoparan, Istanbul

Tel: 0212 482 2340 Fax: 0212 482 2980

Web page: www.akuder.org.tr

AKUDER is acting in the field of accumulator recycling.

THE FOUNDATION FOR PROTECTION OF ENVIRONMENT & RECYCLING PACKAGING WASTES (CEVKO)

Cenap Sehabettin Sok. No:94

Kosuyolu, Istanbul

Tel: 0216 428 7890 Fax: 0216 428 7895

Web page: www.cevko.org.tr

CEVKO was established on November 1991 with the objective of playing a leader role in and contributing to the formation and coordination of a packaging waste recovery system in Turkey.

THE FOUNDATION FOR THE PROMOTION & PROTECTION OF ENVIRONMENT & CULTURAL HERITAGE (CEKUL)

Ekrem Tur Sok. No:8

Beyoglu 34435, Istanbul

Tel: 0212 249 6464 Fax: 0212 251 5445

Web page: www.cekulvakfi.org.tr

CEVKO was established on November 1991 with the objective of playing a leader role in and contributing to the formation and coordination of a packaging waste recovery system in Turkey.

CHAMBER OF ENVIRONMENTAL ENGINEERS (CMO)

Selanik Caddesi 19/11

06650 Kizilay, Ankara

Web page: www.cmo.org.tr

Tel: 0312 418 8071 Fax: 0312 419 8074

Chamber of Environment Engineers was being and incorporated trade association that intent to work and make suggestions on environmental area for common weal and country benefits.

TURKISH MARINE ENVIRONMENT (DENIZTEMİZ / TURMEPA)

Nakkastepe Aziz Bey Sok. No:1

Kuzguncuk 34674, Istanbul

Web page: www.turmepa.org.tr

Tel: 0216 310 9301 Fax: 0216 343 2177

Established in 1994, it is the first NGO in Turkey advocating for protection of marine environment.

ASSOCIATION FOR THE PROTECTION OF THE WILDLIFE (DHKD)

Halaskargazi Cad. Zafer Sok. No:1 Kat:2

Sisli 34363, Istanbul

Web page: www.dhkd.org

Tel: 0212 232 0266 Fax: 0212 231 5514

The association acts in nature protection and bio-diversity areas.

TURKISH NATIONAL COMMITTEE ON RESEARCH & AUDIT OF SOLID WASTES (KAKAD)

Bogazici University, Institute of Environmental Science

Bebek, Istanbul

Web page: www.kakad.boun.edu.tr

Tel: 0212 359 4476 Fax: 0212 257 5033

The aim of the Committee is to research and audit of solid waste issues, organizing symposiums, publishing scientific publication, auditing solid waste pollution in Turkey and cooperating private establishments.

REGIONAL ENVIRONMENTAL CENTRE FOR CENTRAL & EASTERN EUROPE (REC TURKEY – REGIONAL ENVIRONMENTAL CENTRE)

Ilkbahar Mah. 15. Cad. 296 Sok. No:8

Yildiz Cankaya 06550, Ankara

Web page: www.rec.org.tr

Tel: 0312 491 9530 Fax: 0312 491 9540

REC Turkey is Turkey office of an independent international organisation established in 1990 by Hungary, USA and the European Commission. The REC works various fields of sustainable development, bridging solutions and stakeholders on issues such as environmental policy, climate change, renewable energy, environmental information and waste management.

WATER CHARITABLE FOUNDATION (SU VAKFI)

Ataturk Bulvari No:148

Aksaray, Istanbul

Tel: 0212 522 3570 Fax: 0212 522 3690

Web page: www.suvakfi.org.tr

The Foundation acts on determination of historical fountain, analysis, due diligence and maintenance of architectural features. It also interested climate change issues.

ASSOCIATION OF PORTABLE BATTERY MANUFACTURERS & IMPORTERS

Turgutreis Bulvari Barboros Cad. Giyimkent Sitesi, C3 / B202, No 48

Atisalani Esenler, Istanbul

Web page: www.tap.org.tr

Tel: 0212 438 0825 Fax: 0212 438 1905

The association is working for collecting recycling and disposing of the waste batteries.

ENVIRONMENT FOUNDATION OF TURKEY (EFT)

Tunali Hilmi Caddesi 50/20

Kavaklidere, Ankara

Tel: 0312 425 5508 Fax: 0312 418 5118

Web page: www.cevre.org.tr

Established February 1978, EFT is working for creating public awareness to environmental issues.

THE TURKISH FOUNDATION FOR COMBATING SOIL EROSION, FOR REFORESTATION & PROTECTION OF NATURAL HABITAT (TEMA)

Cayir Cimen Sok. Emlak Kredi Bloklari A-2 Blok Kat:2 Daire:8

Levent 34330, Istanbul

Tel: 0212 283 7816 Fax: 0212 281 1132

Web page: www.tema.org.tr

Established September 1992 by two Turkish businessmen Hayrettin Karaca and Nihat Gokyigit, TEAM became a leading NGO attracting public awareness for environmental issues.

THE UNION OF CHAMBERS & THE COMMODITY EXCHANGES OF TURKEY (TOBB) QUALITY AND ENVIRONMENT DIVISION (TOBB QUALITY & ENVIRONMENT)

Ataturk Bulvari No:149 Bakanliklar Anakara

Tel: 0312 413 8340 Fax: 0312 425 1422

Web page: www.tobb.org.tr/organizasyon/sanayi/kalitecevre/dernekvakif/php

The foundation aims to transfer knowledge on environmental issues to industrialists.

TOBB STOCK EXCHANGE FOR WASTE RECYCLING (TOBB ATIK BORSASI)

2. Menekse Sok. No:29/4 Kizilay Anakara

Tel: 0312 413 8340 Fax: 0312 425 1422

Web page: www.atikborsasi.tobb.org.tr

Waste Stock Exchange is an intermediary organisation for recycling of industrial wastes.

ASSOCIATION FOR FOREIGN CAPITAL COORDINATION (YASED)

Barbaros Bulvari

Morbasan Sokak

Koza Is Merkezi B Blok Kat 1

80700 Besiktas, Istanbul

Tel: 0212 272 5094 Fax: 0212 274 6664

Web page: www.yased.org.tr

ASSOCIATION OF PRACTITIONERS OF ENVIRONMENTAL TECHNOLOGY (CEVRETED)

Irfan Bastug Caddesi, Yuva 3 Apt. D.10

Gayrettepe 80280 Istanbul

Tel/Fax: 0212 274 8681 Fax: 0212 272 2904

3.2 SECTOR JOURNALS

IBS identified seven sector magazines and journals. Especially Ekoloji Teknik and Su ve Cevre as well as journals of *Chamber of Environmental Engineers* are the effective ones in the sector.

Name: Ekoloji (International Journal of Environment)

Web-page: (www.ekoloji.com.tr)

Journal of Ekoloji has been published regularly since 1991. Ekoloji has, without a doubt, a distinctive place. It is the first and only scientific environmental journal in Turkey. With an editor board consisting of national and international academicians, it publishes the works of academicians. Juornal of Ekoloji is indexed by more than 45 international indexes.

Name: Ekoloji Magazin

(Turkish Popular Magazine in the Environmental Field)

Web-page: (www.ekolojimagazin.com)

In order to reach masses of people and establish awareness in Turkish society, The Foundation for Environmental Protection and Research (CEVKOR) has been publishing this popular journal since 2004.

Name: Ekoloji Teknik (Environment and Energy Sector Magazine)

Web-page: (www.ekolojiteknik.com)

Ekoloji Teknik contains an in-depth analysis of major news stories and provides professionals with the latest information in the environment and energy sector. It is published quarterly. Readers of the publication are top management, leading experts, industry buyers, policy makers, academics, up-and-coming young professionals and opinion formers within the environment and energy sectors.

Name: Su ve Cevre (Water & Environment Sector Magazine)

Web-page: (www.sucevre.com)

Doga Sectoral Publishing Company has been publishing Su ve Cevre since 2005. The sector magazine is published bi-monthly and an annual magazine in English was published every year. The publishing company has been publishing a sector catalogue since 2006.

Name: Cevre Bilim ve Teknoloji Dergisi (Environment, Science & Technology Journal)

Web-page: (www.cmo.org.tr)

Chamber of Environmental Engineers (CEE) has been publishing this semi academic journal quarterly.

Name: Cevre ve Muhendis (Environment & Engineer)

Web-page: (www.cmo.org.tr)

Chamber of Environmental Engineers (CEE) has been publishing this sector magazine monthly especially to communicate with its members.

Name: İklim Degisikligi ve Cevre Dergisi (Journal of Climate Change & Environment)

Web-page: (www.iklimdergisi.com)

Published three times a year by the Water Charitable Foundation of Turkey, the journal includes articles of academicians and sector engineers and experts. Mostly focussed on climate change issues.

3.2 MAJOR SECTOR FAIRS & SEMINARS

The major fair and conferences related with the sector which will be held within June 2010.

Name: **ICCI 2009**, International Energy & Environment Fair and Conference
Subjects: Energy and Environment
Products: Energy generation and environmental technologies (Fossil fuel systems, renewable energy systems, environment and recycling)
Place: WOW Kongre Merkezi
Organiser: Sektörel Fuarçılık Ltd. Şti.
Date: May.13 to 15, 2009
Web page: www.icci.com.tr

Name: **REW Recycling 2009**, (5th International Recycling Environmental Technology & Waste Management Trade Fair)
Subjects: Environment, recycling, waste management, water technologies, municipality, urban furnishing
Products: Solid Waste, Water and Waste Water, Sludge, Waste Gas, Energy, General Equipment, Urban Environmental Cleaning Vehicles and Equipment, Measurement and Control Technologies
Place: Tüyap Fuar ve Kongre Merkezi
Organiser: IFO İstanbul Fuar Hizmetleri A.Ş.
Date: June.18 to 21, 2009
Web page: www.rewistanbul.com

Name: **RENEX 2009**
Subjects: Environment, recycling, waste management, water technologies, municipality, urban furnishing
Products: Solar, Biomass, Cogeneration, Geothermal, Wind, Exchanger Systems, Water Counters, Filters, Ground Air, Heat Pumps, Fuel
Place: İstanbul Fuar Merkezi
Organiser: Hannover Messe Sodeks Fuarçılık A.Ş.
Date: November.5 to 8, 2009
Web page: www.dunyafuar.com.tr

Name: **WATECO 2009**, 4TH Water, Wastewater, Environmental Technologies, Infrastructure & Installation Fair
Subjects: Environment, recycling, waste management, water technologies, municipality, urban furnishing
Place: Tüyap Fuar ve Kongre Merkezi
Organiser: Tüyap
Date: December.17 to 20, 2009
Web page: www.tuyap.com.tr

Name: **CET10 (3rd Environmental Technologies & Renewable Energy Fair)**
Subjects: Environmental technologies and renewable energy

Products: Environmental health, treatment systems, Alternative and renewable energy systems, Recycling, Emission, Environmental consultancy etc.
Place: Kulturpark, Izmir
Organiser: Forum Fairs & Promotion Company
Date: June.3 to 6, 2010
Web page: www.cet09.com

ANNEXES

A1 EUROPEAN COMMISSION'S TURKEY 2008 PROGRESS REPORT¹⁶

The following section is extracted from the report presented by the European Commission to the European Parliament and The Council on November 5, 2008.

Chapter 27: Environment

In the field of **horizontal legislation**, some progress can be reported. The Environmental Impact Assessment (EIA) directive has been transposed to a large degree. However procedures for consulting the public and trans-boundary consultations are not fully aligned. Turkey has not yet signed the Kyoto Protocol and Turkey is not a party to the Espoo and Aarhus Conventions. The Emissions Trading Directive has not been transposed. A greenhouse gas emission trading scheme has not yet been established. Transposition of the Strategic Environmental Assessment (SEA) Directive is at an early stage. There has been no progress on transposition of the acquis on environmental liability, public participation and public access to environmental information. Nor has Turkey yet started negotiations on the EN 77 EN memorandum of understanding with on its participation in the Community civil protection financial instrument.

In the case of **air quality**, Turkey has made good progress in alignment with the air quality framework legislation and daughter directives. Progress has also been made on the sulphur content of liquid fuels in domestic heating systems. The administrative capacity for regional air quality has been improved by establishing a clean air centre in Marmara. No progress has been made on legislation related to the acquis on emissions of volatile organic compounds, on the sulphur content of certain liquid fuels or on national emission ceilings.

Some progress can be reported on alignment with the **waste management** acquis. Implementing legislation on polychlorinated biphenyls (PCB & PCT) and on the control of waste oils has been adopted. Furthermore, restriction of use of certain hazardous substances in electrical and electronic equipment and on restoration and management of extractive industry sites has been adopted. Alignment in this area is well advanced. However, Turkey does not have a national waste management plan. Progress on end-of-life vehicles and waste electrical and electronic equipment has been very limited. No progress has been made regarding the directives on landfill.

There has been little progress in the area of **water quality**. An amendment was made to the legislation on prevention of water pollution. However, the overall level of alignment remains low. The institutional framework for water management is not organised on a river basin basis. Trans-boundary consultations on water issues are at an early stage.

Limited progress can be reported on **nature protection**. Turkey has aligned with the acquis regarding establishment and management of zoos. However, the level of harmonisation and implementation remains very low. The continuing loss of habitats is a cause for concern. The list of potential Natura 2000 sites has not yet been compiled. A framework law on nature protection and implementing legislation on birds and habitats have not yet been adopted. A national biodiversity strategy and action plan have been prepared, but not yet adopted by the government.

¹⁶ Full text available at http://ec.europa.eu/enlargement/pdf/press_corner/key-documents/reports_nov_2008/turkey_progress_report_en.pdf

No progress can be reported regarding **industrial pollution control and risk management**. Turkey has aligned with some provisions of the Seveso II Directive and with the Large Combustion Plants and Waste Incineration Directives. However, overall transposition and implementation remain very low. Introduction of an integrated permit system is at an early stage.

There has been limited progress in the field of **chemicals**. The legislation on dangerous chemicals has been amended. Overall, the level of transposition remains low. The capacity for effective implementation is insufficient.

No progress can be reported on **genetically modified organisms**.

Progress has been made in the field of **noise**. Following adoption of the implementing legislation Turkey is approaching full alignment with the acquis in this area. However, preparation of noise maps and action plans is at an early stage.

Some further progress has been made in the area of **administrative capacity**. A substantial number of staff was recruited and trained by the Ministry of Environment and Forestry (MoEF). A new department for implementation of the environment programmes under IPA has been established in the Ministry. The Directorate-General for State Hydraulic EN 78 EN Works is now affiliated to the MoEF. However, no progress has been made on establishment of a national environment agency. Responsibilities, such as inspection activities and nature protection, are not clearly defined. Administrative capacity needs further strengthening, including coordination between the relevant authorities at all levels. Mainstreaming of environmental protection into other policy areas and ensuring that new investments comply with the environmental acquis are at an early stage. Some of the existing legislation, such as the Mining Law, which includes gold mining, and the tourism legislation, are causing major damage to natural areas.

Conclusion

Turkey has made progress in the area of air quality and good progress on strengthening the administrative capacity at central level. Some progress can be reported on waste, water and nature protection. However, the overall level of alignment remains low. Turkey has made no progress in the areas of industrial pollution and risk management and GMOs. Limited progress can be reported on chemicals. Delays in establishment of the EIA are hampering further improvements in implementation and enforcement.

A2 PUBLIC PROJECTS 2008-2009

PUBLIC ENVIRONMENTAL PROJECTS, 2008-2009, (€)								
	Total 2008	2009p	Own Funds		Credit		Loans	
			2008	2009p	2008	2009p	2008	2009p
TOTAL PUBLIC	2,302,683	929,453	2,166,803	692,270	614,926	68,039	124,321	223,937
<i>DRINKING WATER PROJECTS</i>	<i>1,691,216</i>	<i>349,335</i>	<i>1,647,856</i>	<i>281,890</i>	<i>605,884</i>	<i>59,030</i>	<i>40,843</i>	<i>63,207</i>
<i>State Hydraulic Works (DSI)</i>	<i>1,623,001</i>	<i>214,597</i>	<i>1,623,001</i>	<i>214,597</i>	<i>603,367</i>	<i>54,792</i>	<i>0</i>	<i>0</i>
Istanbul Buyuk Melen 2nd Stage	1,133,370	70,134	1,133,370	70,134	603,367	54,792		
Siirt "Urgent" drinking water	17,178	16,000	17,178	16,000				
Aydin/Ortaklar drinking water	51,280	13,911	51,280	13,911				
Izmir drinking water 2nd Stage	85,248	13,150	85,248	13,150				
Finalisation of other unfinished works	0	10,520	0	10,520				
Trabzon drinking water	93,794	8,767	93,794	8,767				
Project and planning works	23,872	7,452	23,872	7,452				
Cankiri drinking water	22,750	6,575	22,750	6,575				
Mugla /Bordrum peninsula drinking water	4,527	6,575	4,527	6,575				
Sirnak drinking water	18,788	6,575	18,788	6,575				
Kahramanmaras (Ayvali) drinking water project	76,190	5,383	76,190	5,383				
Karaman drinking water	28,814	5,260	28,814	5,260				
Mersin-Tarsus (Pamukluk) drinking water	0	5,250	0	5,250				
Afyonkarahisar drinking water project	34,161	4,462	34,161	4,462				
Adiyaman drinking water project	1,471	4,383	1,471	4,383				
Corum (Hatap) drinking water	22,311	3,858	22,311	3,858				
Zonguldak drinking water	2,944	3,287	2,944	3,287				
Batman drinking water (under GAP programme)	0	3,216	0	3,216				
Hatay B.Karacay drinking water	1	2,879	1	2,879				
Gemlik drinking water	0	2,625	0	2,625				
Iskenderun drinking water	0	2,625	0	2,625				
						

	Total		Own Funds		Credit		Loans	
	2008	2009p	2008	2009p	2008	2009p	2008	2009p
Yozgat (Musabeyli) drinking water	1,415	2,192	1,415	2,192				
Tekirdag drinking water	0	2,192	0	2,192				
Unye drinking water (under DOKAP programme)	0	1,812	0	1,812				
Kars drinking water (under DAP programme)	0	1,575	0	1,575				
Ordu drinking water (under DOKAP programme)	0	1,575	0	1,575				
Sinop drinking water	0	1,575	0	1,575				
Karabuk drinking water	0	787	0	787				
Ankara drinking water 2nd stage (Gerede)	4,886	1	4,886	1				
Bank of Provinces	47,382	125,353	4,904	59,790	1,635	4,238	40,843	61,324
37 projects (for Municipalities less than 3,000 pop.)	0	45,627	0	45,627	0	0	0	0
Mersin drinking water	4,950	20,612	0	0	0	0	4,950	20,612
Antalya drinking water	15,719	16,540	0	0	0	0	15,719	16,540
Denizli drinking water	1,260	8,522	0	0	0	0	1,260	8,522
Machinery and equipment for several projects	0	7,956	0	7,956	0	0	0	0
29 small size drinking water projects	3,067	5,236	3,067	5,236	0	0	0	0
Adapazari 4th drinking water	10,237	4,803	0	0	0	0	10,237	4,803
Izmir (Odemis) drinking water	1,635	4,238	0	0	1,635	4,238		
Elbistan drinking water	184	3,917	0	0	0	0	184	3,917
Kutahya drinking water	4,777	3,438	0	0	0	0	4,777	3,438
4 World Bank funding new projects	0	2,362	0	0	0	0	0	2,362
Bolu II drinking water	1,837	971	1,837	971	0	0	0	0
Mugla drinking water	2,038	874	0	0	0	0	2,038	874
Antalya (Ilca) drinking water	1,677	255	0	0	0	0	1,677	255
MoEF	0	4,020	0	2,138	0	0	0	1,882
Drinking water supply	0	2,003	0	2,003	0	0	0	0
IPA planning works	0	1,479	0	0	0	0	0	1,479
National water management plan	0	538	0	134	0	0	0	403
Municipalities	20,833	5,365	19,950	5,365	882	0	0	0
ESKI (Eskisehir), drinking water	20,833	5,365	19,950	5,365	882	0	0	0
Ministry of Defence	6,000	6,153	6,000	6,153	0	0	0	0
Military drinking water	6,000	6,153	6,000	6,153				

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	Total		Own Funds		Credit		Loans	
	2008	2009p	2008	2009p	2008	2009p	2008	2009p
WASTEWATER PROJECTS	473,073	501,035	404,546	365,223	0	0	68,527	135,811
Bank of Provinces	173,075	298,318	129,318	170,506	0	0	43,757	127,812
79 sewerage network projects	38,867	94,944	38,867	94,944	0	0	0	0
Other projects	0	62,436	0	59,549	0	0	0	2,887
Antalya (ASAT) treatment plant	6,299	59,477	0	0	0	0	6,299	59,477
13 Earthquake region projects	38,238	21,230	8,229	4,621	0	0	30,009	16,609
Denizli sewerage network	1,155	19,189	0	0	0	0	1,155	19,189
Mugla treatment plant	5,426	15,589	0	0	0	0	5,426	15,589
6 sewerage network projects	82,223	11,392	82,223	11,392	0	0	0	0
K.maras Elbistan treatment plants	184	7,737	0	0	0	0	184	7,737
Izmir Odemis treatment plant	236	5,912	0	0	0	0	236	5,912
Antalya Ilica sewerage network	447	412	0	0	0	0	447	412
MoEF	6,829	3,971	6,336	2,803	0	0	492	1,168
Other wastewater projects	0	2,801	0	2,801	0	0	0	0
Gocek 2nd Stage sewerage network	477	1,166	0	0	0	0	477	1,166
Mersin Atayurt-Arkum treatment	15	2	0	0	0	0	15	2
Mugla Akyaka treatment plant	6,336	2	6,336	2	0	0	0	0
Municipalities	293,169	198,746	268,892	191,915	0	0	24,278	6,832
BUSKI (Bursa), network & treatment	27,757	61,066	27,757	61,066	0	0	0	0
MESKI (Mersin), network & treatment	94,929	29,978	94,929	29,978	0	0	0	0
SASKI (Samsun), network & treatment	42,613	25,925	42,613	25,925	0	0	0	0
ESKI (Eskisehir), network & treatment	22,794	17,250	22,794	17,250	0	0	0	0
Zonguldak Municipality, network & treatment	2,102	16,184	2,102	16,184	0	0	0	0
Mugla (Fethiye) Municipality, network & treatment	0	12,752	0	12,752	0	0	0	0
Kirikkale Municipality, network & treatment	9,554	11,470	9,554	11,470	0	0	0	0
Batman Municipality, network & treatment	9,720	9,120	7,218	6,740	0	0	2,502	2,380
Nevsehir Municipality, network & treatment	1,333	4,441	333	1,110	0	0	1,000	3,331
Van Municipality, network & treatment	964	2,625	964	2,625	0	0	0	0
KOSKI (Konya), treatment	18,502	2,590	18,502	2,590	0	0	0	0
Sivas Municipality, network & treatment	30,190	1,893	30,190	1,893	0	0	0	0
Siirt Municipality, network & treatment	31,786	1,776	11,325	666	0	0	20,461	1,110
Tokat Municipality, network & treatment	611	1,666	611	1,666	0	0	0	0
Ordu Municipality, project planning	157	5	0	0	0	0	157	5
Tokat (Turhal) Municipality, project planning	157	5	0	0	0	0	157	5
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	Total		Own Funds		Credit		Loans	
	2008	2009p	2008	2009p	2008	2009p	2008	2009p
State Economic Enterprises (KIT)	63,024	5,382	63,024	5,382	0	0	0	0
Sugar factories, treatment plants	62,322	131	62,322	131	0	0	0	0
Eti Mining, treatment plants	563	788	563	788	0	0	0	0
MKEK, treatment plant	139	4,462	139	4,462	0	0	0	0
WASTE	48,039	68,766	24,046	34,839	9,042	9,008	14,951	24,919
Bank of Provinces	1,202	11,960	0	8,189	0	0	1,202	3,770
Un-completed projects	0	4,347	0	4,347	0	0	0	0
Solid waste management planning	0	3,843	0	3,843	0	0	0	0
Bergama solid waste	422	2,038	0	0	0	0	422	2,038
Gelibolu solid waste	780	1,732	0	0	0	0	780	1,732
MoEF(1)	3,769	2,894	3,769	2,894	0	0	0	0
Landfill rehabilitation	0	1,055	0	1,055	0	0	0	0
Landfills	0	1,050	0	1,050	0	0	0	0
Solid waste services	1,575	787	1,575	787	0	0	0	0
Mersin (Goksu) solid waste	2,194	1	2,194	1	0	0	0	0
GAP	566	849	566	849	0	0	0	0
Kilis landfill construction	566	849	566	849	0	0	0	0
MoEF (2)	42,502	53,064	19,711	22,907	9,042	9,008	13,749	21,149
Kusadasi region solid waste	13,172	15,152	6,394	7,356	0	0	6,778	7,796
Canakkale region solid waste	13,036	10,285	6,065	4,796	0	0	6,971	5,489
Municipality of Istanbul, eight sea cleaning vehicles	0	7,428	0	1,487	0	5,940	0	0
Amasya region solid waste	0	4,284	0	1,961	0	0	0	2,323
Bitlis region solid waste	0	3,873	0	1,731	0	0	0	2,142
Kutahya region solid waste	0	3,441	0	1,792	0	0	0	1,649
Municipality of Samsun, solid waste	15,780	2,708	6,738	1,531	9,042	1,177	0	0
IPA solid waste investment package	0	2,377	0	627	0	0	0	1,750
Municipality of Mersin, organized landfill	0	2,220	0	740	0	1,480	0	0
Municipality of Eskisehir, solid waste planning	0	394	0	188	0	205	0	0
Municipality of Eskisehir, Porsuk rehabilitation plan	0	394	0	188	0	205	0	0
East Black Sea solid waste management planning	0	297	0	297	0	0	0	0
Solid waste management planning stage 2	514	213	514	213	0	0	0	0
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	Total		Own Funds		Credit		Loans	
	2008	2009p	2008	2009p	2008	2009p	2008	2009p
<i>NATURE PROTECTION</i>	<i>3,088</i>	<i>7,037</i>	<i>3,088</i>	<i>7,037</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>MoEF</i>	<i>3,088</i>	<i>7,037</i>	<i>3,088</i>	<i>7,037</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
GAP Environment plans	525	1,995	525	1,995	0	0	0	0
Nature protection projects	2,563	5,042	2,563	5,042	0	0	0	0
<i>AIR SECTOR</i>	<i>87,267</i>	<i>3,281</i>	<i>87,267</i>	<i>3,281</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>State Economic Enterprises (KIT)</i>	<i>87,267</i>	<i>3,281</i>	<i>87,267</i>	<i>3,281</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Sugar Factories	1,127	787	1,127	787	0	0	0	0
Yenikoy TPP	86,140	2,494	86,140	2,494	0	0	0	0
P: programme								
Source: State Planning Organization (SPO)								

A3 SELECTED MAJOR PUBLIC TENDERS, 2008-2009

SELECTED MAJOR PUBLIC TENDERS IN ENVIRONMENTAL SECTOR, January 2008- April 2009

Project Name	Project Coverage	Main Contrator	Project Value (TL Mn)	Project Duration
Istanbul Greater City Municipality (ISKI)	Melen-Darlik pipeline connection	Kalyon İnsaat	116.7	2008-2009
Eskisehir Greater City Municipality (ESKI)	Wastewater treatment, rehabilitation & construction	Alke Insaat	44.6	2008-2010
Istanbul Greater City Municipality (ISKI)	Frizkoy wastewater tunnels	Oztas Insaat	34.9	2008-2011
Istanbul Greater City Municipality (ISKI)	Operation services for 107 treatment facilities	Kuzu Insaat	29.8	2008-2009
DSI	Adiyaman drinking water network construction	Cem-Sel Insaat	26.8	2008
DSI	Siirt drinking water network	Aykon Elektrik	21.9	2009-2010
Izmir Greater City Municipality (IZSU)	Goksu-Sarikiz arsenic treatment	Culligan Italiana Spa	20.4	2008-2009
Ankara (Municipality of Sereflikochisar)	Drinking water, wastewater treatment	Grafik Tahaaut	17.9	2007-2009
Sugar Factories	Wastewater treatment of four factories	Artas Muhendislik	17.4	2008-2010
Balikesir (Kucukkoy) (Bank of Provinces)	Drinking water, wastewater treatment	Arbiogaz	17.4	2009-2011
Antalya Greater City Municipality (ASAT)	Wastewater pump stations	Mass Aritma	15.3	2009-2010
Istanbul Greater City Municipality (ISKI)	Asian side, 2nd region, wastewater treatment	Kuzu Insaat	13.5	2008-2009
Samsun, Bafra Municipality	Rehabilitation of water treatment facility	MPE Muhendislik	12.0	2008-2009
Istanbul Greater City Municipality (ISKI)	Asian side, 4th region,micro-tunnel	Beton&Rohbrau	11.2	2008-2011
Izmir Greater City Municipality (IZSU)	Menemen wastewater treatment	Sif Musavirlik	9.5	2008-2009
Kocaeli Greater City Municipality (ISU)	Plajyolu Wastewater treatment facility	Hidrotek (Veolia)	8.9	2008-2009
Kutahya Municipality	Solid waste, landfill construction	Istac	8.5	
Izmir Greater City Municipality (IZSU)	Menemen Halkapinar arsenic treatment	Aritim Muhendislik	8.2	2008-2009
Osmaniye Municipality	Solid waste, construction	Cam Gaz	8.1	2009
Mersin Greater City Municipality (MESKI)	Drinking water, wastewater treatment	Esen Insaat	7.1	2009-2010
Izmir Greater City Municipality (IZSU)	Aliaga wastewater treatment, construction	Hidrotek (Veolia)	7.1	2009-2010
Mersin Greater City Municipality (MESKI)	Erdemli, drinking water, wastewater treatment	Esen Insaat	7.1	2009-2010
Kayseri (Municipality of Yahyali)	Wastewater treatment, network development	Hayasel Insaat	6.2	2009-2011
Ankara Greater City Municipality (ASKI)	Kirsehir Wastewater treatment	AKM Yapi	5.9	2008-2009
Eskisehir Greater City Municipality	Solid waste, construction	Goksin Insaat	5.9	2008-2009
Municipality of Sirnak	Landfill construction	Aksel Klima	5.9	2008-2010
DSI	Siirt (Urgent) drinking water, pumping station	Aykon Elektrik	5.8	2008-2009
ASKI	Pumping stations	Ozdoganlar Insaat	5.7	2008-2009

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Project Name	Project Coverage	Main Contrator	Project Value (TL Mn)	Project Duration
Izmir Greater City Municipality (IZSU)	Torbali wastewater treatment	Can Ozdemir Insaat	5.7	2008-2009
Izmir Greater City Municipality (IZSU)	Kemalpasa wastewater treatment	Delta Insaat	5.5	2008-2009
Ankara Greater City Municipality (ASKI)	Ayas-Sinanli Wastewater treatment facility	Ertugrul Insaat	5.5	2009-2010
Aksaray-Nigde-Nevsehir	Drinking water, arsenic treatment	Hidrotek (Veolia)	5.3	2009
Municipality of Siirt	Landfill construction	Histac Muhendislik	5.3	2008-2009
Izmir Greater City Municipality (IZSU)	Bayindir wastewater treatment	Ovgu Insaat	4.9	2008-2009
Izmir Greater City Municipality (IZSU)	Seferihisar wastewater treatment	Delta Insaat	4.9	2008-2009
Antalya Greater City Municipality (ASAT)	Operation services for Lara & Hurma treatment facilities	Envy Enerji ve Cevre		4.7
Bank of Provinces	Avsa drinking water, seawater desalination	Deniz Su	4.4	2008-2009
Izmir Greater City Municipality (IZSU)	Urla wastewater treatment	Sif Musavirlik	4.4	2008-2009
Izmir Greater City Municipality (IZSU)	Ayrancilar-Yazibasi wastewater treatment	Can Ozdemir Insaat	4.3	2008-2009
Yalova (Armutlu) (Bank of Provinces)	Drinking water, wastewater treatment	Mintas Muhendislik	3.6	2008-2010
Kayseri Greater City Municipality (KASKI)	Construction of 5 wastewater treatment facilities	Kuzenler Muhendislik	3.2	2008-2009
Nevsehir (Municipality of Derinkuyu)	Wastewater treatment, construction	Kaya erdem	2.9	2008-2010
İzmir, Municipality of Bergama (ISTAC tender)	Landfill construction	Kata Insaat	2.8	2008-2009
MoEF	Mersin (Goksu) landfill construction	Ak-Eli Insaat	2.8	2008
Adana Greater City Municipality (ASKI)	Water and wastewater treatment	Istanbul Cevre Aritma	2.1	2008
Trabzon (Uzungol) (Bank of Provinces)	Drinking water, wastewater treatment	Hakay Yapi	1.3	2008

Source: IBS research, SPO, Municipalities, Bank of Provinces, DSI