

# 5

## ENVIRONMENTAL – ECONOMIC INTERFACE\*

### Features

- Pollution, energy and resource intensities
- National development planning and programming
- Environmental assessment of projects
- Environmental expenditure and financing
- Institutional environmental framework
- Regulatory and economic instruments
- Monitoring and compliance assurance
- Natural disasters and technological accidents

\* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1999. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy.

## Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Turkey:

- establish a “*green tax commission*” to review and revise the full range of economic instrument of relevance for the environment (i.e. taxes, charges, trading, others); consider a comprehensive green tax reform, possibly in a revenue neutral perspective; review *motor vehicle related taxes*; introduce taxes on polluting products and inputs (e.g. detergents, batteries, pesticides, fertilisers, CFCs);
- reduce *environmentally harmful subsidies*, in particular in the agriculture and energy sectors, with appropriate measures to deal with competitiveness and distributive implications;
- expand *economic information* on the environment (e.g. environmental expenditure, environmentally-related taxes, resource prices, employment); develop *economic analysis* (e.g. cost-benefit analysis of environmental projects);
- undertake strategic *environmental assessment* concerning transport and agriculture policies;
- maintain a focus on *sustainable development* within the government, and the country more broadly, through an interministerial committee and associated advisory council that provide for broad participation by private sector institutions and the public.
- continue to *harmonise the national environmental legislation with the EU environmental acquis*, following the EU Integrated Environmental Approximation Strategy, with particular attention to framework Directives and EU emissions and quality standards;
- strengthen the *permitting system*: moving from media based permitting to integrated pollution prevention and control, distinguishing large and small/medium size installations; using periodic permit renewals to gradually introduce stricter emission standards; and promoting best available technology;
- strengthen the *enforcement system*, through: an autonomous environmental agency in charge of inspection at national and territorial levels, increased resources for inspections and compliance monitoring, and increased training for inspectors; integrate environmental concerns (i.e. pollution, natural resources, nature concerns) at all levels of *land-use planning*, and strengthen land-use plans enforcement;
- develop the use of economic instruments, seeking *an effective and efficient mix of instruments*, with due regard to social issues; promote the implementation of the *polluter pays and user pays principles*, with a progressive shift from public to private funding, and a time limit for environmental subsidy schemes;
- develop *public-private partnerships* and industry-driven environmental initiatives with appropriate involvement of the Turkish Business Associations;

- strengthen the *emergency preparedness and response* system (e.g. establishing a commission to support the implementation of legislation concerning natural and industrial disasters, extending institutional co-ordination, acquiring appropriate equipment, performing regular drills and simulations);
- increase the *capacity* of provincial and municipality authorities to prepare and implement environmental infrastructure projects, including those with EU funding; continue the reform of the Bank of Provinces to increase the efficiency in transfers of public funds to municipalities and in municipal investments.

## Conclusions

### *Integrating environmental concerns into economic decisions*

Within a strong national *economic and development planning* founded on National Development Plans (NDP), increasing integration of environmental concerns has been achieved in several sectors, thus providing some progress in the practice of sustainable development. High road fuel prices and taxes (among the highest among OECD countries) provided incentives to reduce the use of petrol and diesel fuel and to renew the motor vehicle fleet. Turkey's *energy intensity* improved as did its *resource intensity*. *Lignite*, which generates significant pollution when used for energy production, does not receive direct subsidies any more. The structure of *agriculture subsidies* has changed promoting more environmentally friendly practices. *Absolute decoupling* took place for municipal waste generation and the use of fertilisers. The regulatory framework for *environmental impact assessment* of projects has been strengthened and steps launched for the introduction of strategic environmental assessment of policies.

However, Turkey is facing a number of environmental challenges due to unsustainable production and consumption patterns. The overall *material intensity* of its economy is still among the highest in the OECD area, as are the *pollution intensities* (e.g. SO<sub>x</sub> and NO<sub>x</sub> emissions per unit of GDP). This partly reflects the structure of its economy (e.g. with the highest imports of scrap metal in the world and their conversion into exports of metal products to the middle-east, with high imports and production of cotton and high exports of cotton products to Europe). Efforts to speed up economic and social development do not always take environmental concerns into account, especially at *sub-national level*, where environmental priorities are not high. Environmentally harmful subsidies, especially in the energy

sector, continue to promote polluting activities. With rapid economic growth, a continued increase in motor vehicles ownership and traffic, as well as in municipal and industrial waste generation can be expected. Waste management will require significantly larger collection and treatment infrastructure. While Turkey's preparations for and immediate follow-up to the 2002 World Summit on Sustainable Development, were widely complimented, the efforts to integrate sustainability into sectoral policies has been implemented via a EU project and should be developed through further steps.

### *Strengthening the implementation of environmental policies*

In the review period, the *EU harmonisation process* has become the main driving force in a major national environmental reform. It translates in a large number of *new environmental legislation and regulations*. The 2006 "comprehensive amendment" of the 1983 Environmental Law, and the new Law on Municipalities contributed to the clarification of environmental responsibilities amongst the various levels of administration. *Enforcement capacities* have been strengthened by new regulations and the creation of a separate division in the Ministry responsible for co-ordination of enforcement efforts. Integration of environmental concerns in *land-use planning* is progressing, though challenges related to unregistered operations remain. Industry is being engaged in voluntary approaches, notably in cement and chemical sectors. Turkey is the OECD country which has the largest revenues from environmentally related taxes (i.e. energy and transport taxes): 4.8% of GDP and 25% of total tax revenue, although these taxes were not designed for environmental purposes. *Public-private partnerships* have been strengthened, including the establishment of Organised Industrial Zones that provide comprehensive environmental services to industry. Estimates of pollution abatement and control expenditure (PAC expenditure) have increased from 1.1% to 1.2% of GDP.

Despite progress in aligning with the EU environmental legislation, transposition is still waiting for several pieces of legislation concerning air, water and nature protection, and several standards are not consistent with EU limit values. *Allocation of environmental responsibilities* among government institutions could benefit from review and revision. Environmental concerns have been too often superseded by development interests in local decision-making. *Implementation and enforcement* remain challenging; a special autonomous environmental agency should be established to drive and conduct environmental inspections at national and territorial levels with appropriate resources, as well as training and monitoring support systems. The *permitting system* needs particular attention, as the current media based procedure is not sufficient, burdensome and needs regular renewal provisions. Despite the introduction of environmental charges, as well as

fuel and motor vehicles tax differentiation, the use of a variety of *economic instruments* for environmental purposes (including specific taxes, charges, emission trading systems) in Turkey should be considered to meet objectives of efficiency and financing, with due regard to social issues. Low landfill charges hamper the recycling industry. A number of unregistered installations, mostly small and medium size, operate without environmental management systems. Adoption of environmental management systems *in industry and public organisations* as well as development of public-private partnerships should be promoted. Turkey faces the challenge of mobilising substantial *financial resources* for environmental investment, especially to work towards its new environmental objectives. This will require engaging *private and public fundings* for environmental improvement, to match external resources provided by the new EU instruments for accession, and strengthening the *capacity of provincial and local authorities* to prepare detailed projects and implement them. This will also require moving progressively to the *full implementation of polluter pays and user pays principles*.



## 1. Progress Towards Sustainable Development

### 1.1 Sustainable development: decoupling results

#### *Economic development*

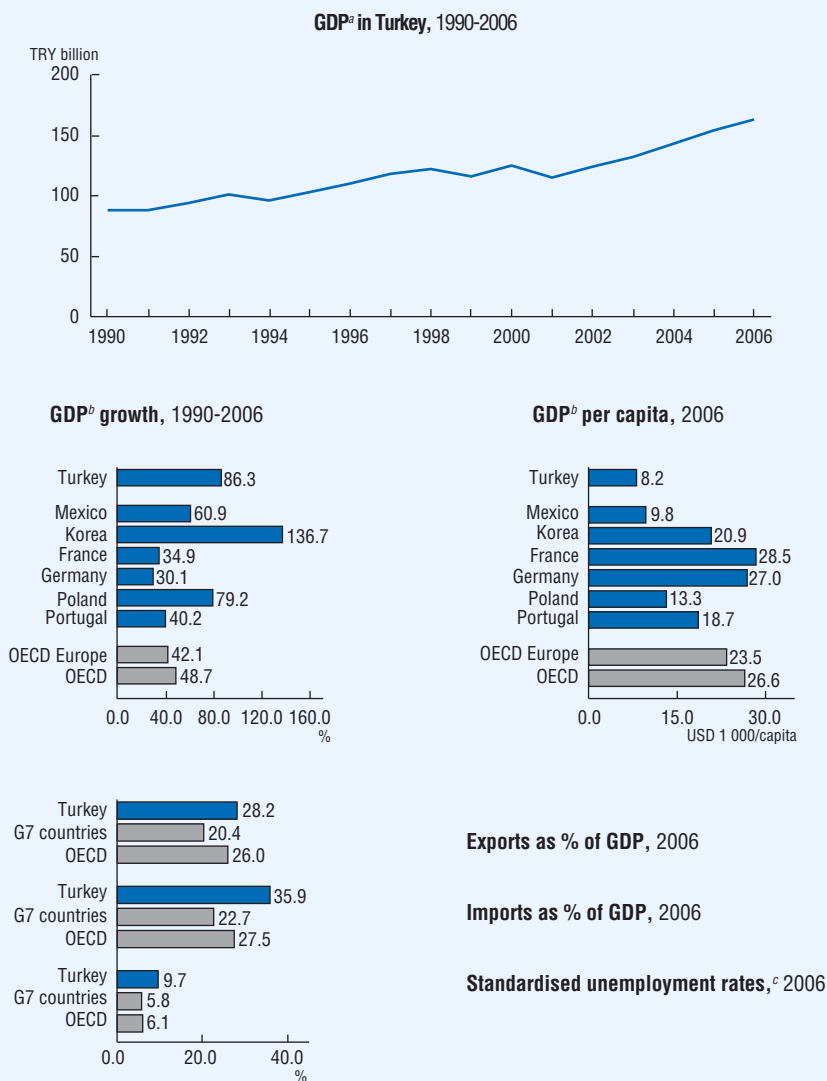
Following continuous growth of GDP in the 1990s (+40%), in 2000 the Turkish economy experienced the *most severe economic crisis* in the country's recent history.<sup>1</sup> In March 2001 a major stabilisation and structural reform programme was put in place, which stimulated economic activities and led to strong growth and large productivity gains (Figure 5.1).

Turkey's *economic recovery* has been impressive, with an average annual growth of 7.5% over 2002-05. Inflation has fallen sharply.<sup>2</sup> Reform has been supported by the convergence of economic policies towards EU benchmarks, following EU candidate status since 1999. Turkey has been among the OECD countries with the strongest economic growth in recent years (Box 5.1).

#### *Pollution intensities*

While  $SO_x$  and  $NO_x$  emissions increased overall by 28% and 66%, respectively, over the period 1990-2005, an absolute decoupling from GDP growth occurred for  $SO_x$  emissions and a relative decoupling for  $NO_x$  emissions between 2000 and 2005 (Table 5.1). However, corresponding emission intensities are among the highest in OECD country (Figure 2.1).

Figure 5.1 Economic structure and trends



a) GDP at 2000 prices.

b) GDP at 2000 prices and purchasing power parities.

c) % of civilian labour force; Turkey: commonly used definition.

Source: OECD (2007), OECD Economic Outlook No. 82.

### Box 5.1 Economic context

Turkey's GDP amounted to USD 603 billion in 2006 (at 2000 prices and PPP). The per capita GDP of USD 8 242 is the lowest in the OECD area. GDP per capita in the richer western regions (e.g. Marmara) is about three times higher than that in the eastern regions (e.g. East Anatolia).

The industrial and service sectors account for, respectively, 29% and 60% of the economy. Turkey has a *rapidly growing private sector*, yet the state still plays a major role in basic industry, banking, transport and communication. Small and medium-sized enterprises (SMEs) provide 61% of total employment, but contribute only 26.5% to GDP. The *informal sector* accounts for 31% of GDP and 51% of the labour force. After years of relatively low *foreign direct investment* (FDI) (less than USD 1 billion), Turkey attracted USD 8.5 billion in 2005.

Whereas *agriculture* accounts for about 11% of GDP, it continues to employ one-third of the Turkish workforce; in 2000-01 an important agricultural reform emphasised privatisation of State-owned organisations and direct income support for farmers, instead of more distorting (and fiscally costly) input and output subsidies.

Between 2000 and 2006 *industrial production* increased by 33%. The largest industrial sector is textiles and clothing (16.3% of industrial production, one-third of industrial employment), followed by oil refining (14.5%), food processing (10.6%) and chemicals (10.3%). Iron and steel (8.9%), automotive manufacturing (6.3%) and machinery (5.8%) together represent 21% of industrial production.

*Tourism* has continued to expand rapidly: between 2001 and 2005 the number of foreign visitors increased by 82%. Receipts from foreign visitors increased by 88.5% and those from domestic visitors by 57.5%. The tourism industry accounts directly for about 5% of GDP and 600 000 jobs, on average, and both directly and indirectly for 10.2% of GDP and 1.5 million jobs.

Turkey's main *trading partners* are the European Union (about 56% of exports and 40% of imports), the United States, Russia and Japan. It has taken advantage of a Customs Union with the European Union (signed in 1995) to increase its industrial production for exports and to benefit from EU foreign investment. In 2007 exports amounted to USD 107 billion, an increase of 25% over 2006. The largest share of goods exports were: automotive (20%), textiles and clothing (15%), iron and steel (10.8%), chemicals and pharmaceuticals (10%) and white goods (8.5%). Exports of textiles and clothing include large amounts of *cotton products*; cotton is imported (Turkey is the world's second largest importer) or produced in Turkey (the Aegean region, Cukurova, and increasingly South-eastern Anatolia). Turkey is the largest importer of *steel scrap* in the world, producing most of its steel using the electric arc furnace; it supplies steel products to the growing markets of the Middle East and the Persian gulf.

Table 5.1 Economic trends and environmental pressure

(% changes)

	1990-2006	1998-2006	2000-06
Selected economic trends			
GDP <sup>a</sup>	86	34	31
Population	30	12	8
GDP <sup>a</sup> /capita	43	20	21
Agricultural production	25	7	6
Industrial production <sup>b</sup>	89	36	33
Road freight traffic <sup>c</sup>	170	31	10
Passenger car traffic volume <sup>d</sup>	203	36	15
Selected environmental pressures			
Pollution			
CO <sub>2</sub> emissions from energy use <sup>e</sup>	70 <sup>g</sup>	20 <sup>g</sup>	8 <sup>g</sup>
SO <sub>x</sub> emissions	28 <sup>g</sup>	6 <sup>g</sup>	-9 <sup>g</sup>
NO <sub>x</sub> emissions	66 <sup>g</sup>	17 <sup>g</sup>	4 <sup>g</sup>
Energy			
Total primary energy supply	61 <sup>g</sup>	18 <sup>g</sup>	11 <sup>g</sup>
Total final consumption of energy	65 <sup>g</sup>	23 <sup>g</sup>	14 <sup>g</sup>
Resources			
Water abstractions	60 <sup>g</sup>	20 <sup>g</sup>	3 <sup>g</sup>
Municipal waste	41	-4	3
Nitrogenous fertiliser use	14 <sup>h</sup>	-2 <sup>h</sup>	7 <sup>h</sup>
Pesticide use <sup>f</sup>	30 <sup>g</sup>	32 <sup>g</sup>	32 <sup>g</sup>

a) At 2000 prices and PPPs.

b) Mining and quarrying, manufacturing, and production of electricity, gas and water.

c) Based on values expressed in tonne-kilometres.

d) Based on values expressed in vehicle-kilometres.

e) Sectoral approach; excluding marine and aviation bunkers.

f) Formulation weight.

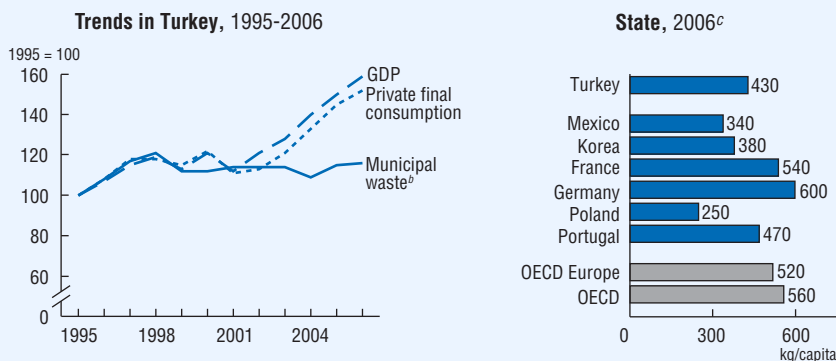
g) To 2005.

h) To 2004.

Source: OECD Environment Directorate; IEA-OECD.

CO<sub>2</sub> emissions from energy use have continued to grow (8% in 2000-05), albeit at a slower rate than GDP (24% over the same period). This slowdown was linked to the 2000 economic downturn, as an initial 15% decrease in CO<sub>2</sub> emissions was followed by an increase of 23%. Per unit of GDP, Turkish CO<sub>2</sub> emissions (0.39 tonnes/USD 1 000) are slightly above the OECD Europe average (0.33 tonnes/USD 1 000). Overall Turkey's CO<sub>2</sub> emissions per capita increased between 1990 and 2005 (by around 33%) while they decreased in OECD Europe (Figure 2.2).



Figure 5.2 Municipal waste generation<sup>a</sup>

a) In interpreting national figures, it should be borne in mind that survey methods and definitions of municipal waste may vary from one country to another. According to the definition used by the OECD, municipal waste is waste collected by or for municipalities and includes household, bulky and commercial waste and similar waste handled at the same facilities.

b) 2004: break in time series.

c) Or latest available year.

Source: OECD Environment Directorate.

Between 1990 and 2006 energy intensity (total energy supply per unit of GDP) fell continuously, with a decrease of 10% in the 2000-06 period (Table 5.1). In 2005 energy intensity was at 0.15 toe/USD 1 000, similar to the level in OECD Europe (Figure 2.4).

Passenger car traffic increased by 170% between 1990 and 2005 (Table 5.1). However, private car ownership (8 cars per 100 persons) is the lowest among OECD countries and a large increase in the number of motor vehicles in use and in road traffic is expected in the years to come (Figure 2.5).

### Resource intensities

Turkey's overall *material intensity*, expressed as domestic material consumption per unit of GDP, is the highest in the OECD area. It remained at about the same level during the 1990s, but declined significantly by 22% thereafter (TurkStat, 2005). While the basis of the fast-growing Turkish economy has progressively shifted from traditional agriculture towards industry and services, there have been recent decreases in intensity in regard to most mining products (including construction minerals, fossil fuels and metals), combined with a decline in intensity in regard to agricultural and forest products. Turkey's demand for *mineral materials* has greatly increased.

*Municipal waste generation* increased by 41% in 1990-2006, with a marked deceleration in 2000-06 (3% increase). In 2006 waste generation amounted to 430 kg per capita, below the OECD average (560 kg per capita) (Figure 5.2). The intensity of use of *nitrogenous fertilisers and pesticides* is among the lowest in any OECD country. *Water abstraction is high*: 17% of available resources, compared to the OECD average of 11.4% (TurkStat, 2005).

### *Assessment*

In the field of the environment, progress has been achieved since the 1999 review. Over the period 1998-2006, *absolute decoupling* took place for SO<sub>x</sub> emissions, municipal waste and fertiliser use. *Relative decoupling* was achieved for CO<sub>2</sub> and NO<sub>x</sub> emissions. However, these decoupling achievements should be further pursued, as Turkey's SO<sub>x</sub> and NO<sub>x</sub> emissions per unit of GDP are among the highest in the OECD area; also, CO<sub>2</sub> emissions have been increasing since 2002. Even if Turkey has considerably lowered the resource intensity of its economy in recent years, there is still room for improvement in resource productivity and in the efficiency of the extraction and processing sectors, especially in the mineral industry. With the rapid economic growth, a continued increase in motor vehicle ownership and traffic can be expected. Similarly, growing volumes of municipal and industrial waste are envisaged, requiring significantly larger waste collection and treatment infrastructures.

## **1.2 Sustainable development in practice: institutional integration**

### *National development planning and programming*

*National Development Plans* (NDPs) continue to be a strong feature of Turkey's governance, guiding the country's economic, social and sectoral development and public investment programmes. The State Planning Organisation (SPO) has an important integration role, as it prepares NDPs and determines investment priorities based on investment requirements. Plan targets are binding for the public sector and indicative for private enterprises. SPO also approves all public investment projects, as well as those proposed by municipalities for financing with domestic or foreign resources. SPO is subordinated to the Prime Minister's office and receives policy direction from the High Planning Council,<sup>3</sup> which is chaired by the Prime Minister and includes cabinet ministers. SPO has the power to require environmental considerations to be incorporated into investment proposals which are totally or partially financed from public funds. Plans are approved by the Turkish Grand National Assembly. They establish the framework for public investment programming.

The character of the 8th (2001-05) and 9th (2007-13) NDPs has shifted from a planning-based concept that formulated a development path for each sector towards a more *strategic approach* to development. For instance, they emphasise institutional and structural reform that allows more efficient functioning of the market, redefinition of the State's role in the economy towards regulatory functions, and increased predictability of government policies. Plans are based on an evaluation of progress in implementing previous plans' commitments.

While the 3rd NDP (1973-1977) included an environmental chapter for the first time, the sustainable development concept was adopted in the 6th NDP (1991-95) and embodied in the following plans. Turkey made progress in implementing the overall objective of the *8th NDP (2001-05)*, which was to create a framework conducive to improving the quality of life of society, continuous and stable growth, and economic transformation towards EU membership and greater global integration (SPO, 2001). Environmental considerations were explicitly mentioned as elements of sectoral policies, including industrial, transport, energy, agriculture, tourism, urban and rural infrastructure, research and development, and education. The 8th NDP included a separate environmental chapter with broad goals but no explicit quantitative targets. The plan referred to Turkey's National Environmental Action Plan, prepared in 1999, as a basis for co-ordinating sectoral policies in achieving sustainable development objectives.

Guided by NDPs, *annual economic development programmes and public investment programmes* are prepared under the supervision of SPO. Attainment of EU candidate status in 1999 and the opening of EU accession negotiations in 2005 gave further impetus to the process of reforming the regulatory framework, including the environmental one. Pre-Accession Economic Programmes (PEPs), prepared every year, set out the structural reform necessary to meet the criteria for EU membership.

Overall, strong and *integrated planning capacity* at the central level provides a powerful mechanism for sustainable development and intersectoral integration. The planning system includes strong commitments to internalise environmental considerations in sectoral policies and serves as a direct guide for the preparation of annual sectoral and public investment programmes. However, many decisions concerning development and the environment are taken at provincial and municipal levels. In the *9th NDP (2007-13)* protecting the environment and improving urban infrastructure are associated with the objective of increasing the competitiveness of the Turkish economy (SPO, 2006a),<sup>4</sup> recognising that better environmental performance is directly linked to greater access to export markets.

### *Sectoral institutional integration*

While SPO has the major national integration role, under the supervision of the Prime Minister's office and the High Planning Council, a number of *ministries* (Agriculture and Rural Affairs, Health, Culture and Tourism, Energy and Natural Resources, Industry and Trade) are involved in environmental policies and many have dedicated offices in charge of the environmental aspects of their policies and their implementation.

Environmental concerns are explicitly included *in sectoral policies and programmes* concerning, inter alia, agriculture, energy, transport, industry (e.g. iron and steel), tourism, and urban and rural development. There are many examples. The reform of *agricultural policy*, in particular the reform of subsidies, integrates environmental requirements. Special provisions and subsidies are provided for the development of agri-environmental measures. *Energy policy*, as set out in the 8th NDP, included provisions for minimising negative impacts on the environment, promoting energy efficiency and increasing the share of renewable energy (e.g. hydro) in energy consumption.<sup>5</sup> The comprehensive 2005 Transportation Master Plan Strategy emphasises reducing air pollution through the promotion of public transportation, transferring part of inter-city freight traffic to railways or sea routes, and improving road and railway infrastructure. Turkey's *Tourism Strategy to 2023* and the 9th NDP promote "Ecotourism Regions" to develop nature-based tourism. The 9th NDP also provides for sustainable management of *fisheries*. The 2006 *National Rural Development Strategy* calls for sustainable utilisation of resources, reducing disparities by raising income level and quality of life in the rural sector, and also protection and improvement of environmental and cultural assets (SPO, 2006b).

In this context, the *sustainable development* concept and related efforts have been largely driven by international events such as the World Summit on Sustainable Development (Box 5.2).

### *Integration at sub-national level*

Environmental policies are implemented at the *territorial level* with the efforts of provincial and municipal authorities. The governor of each province, appointed by the Ministry of Interior, is responsible for co-ordinating various efforts and ensuring that policies are implemented according to government policy guidelines.

The *Local Agenda 21* programme, launched in 1999, provided an opportunity for the enhancement of local democracy and for practical implementation of the concept of "good governance" (Chapter 6). The emerging model of city councils and other

participatory platforms helped to strengthen local and municipal policies and decisions. This programme also played an enabling and facilitating role in the recovery and reconstruction process following the eastern Marmara earthquake of 1999 (UNDP, 2004).

### *Environmental assessment of projects*

The *regulation on the environmental impact assessment* (EIA) of investment projects, adopted in 1993, was amended in 1997, 2002, 2003 and 2004. The revisions introduced new selection criteria to determine whether EIA is required.<sup>6</sup> The time it takes to obtain an EIA report was reduced to 33 days from the earlier six to seven months. The transparency of EIA procedures was increased. EIA regulations are being harmonised with the EU EIA Directives, except for issues related to EIA in a transboundary context (Innanen, 2004).<sup>7</sup> Mining projects are still not included for EIA consideration. The 1997 amendment required that consultants who carry out the EIA should be certified, but this provision was later removed.

## Box 5.2 Sustainable development

The writings and declarations of Turkish public figures, private sector representatives and the media over the review period reflect *a widespread appreciation of, and commitment to, sustainable development*. The concept first appeared as a national objective in Turkey's 6th National Development Plan (1991-95), was explicitly addressed in a comprehensive manner in the 7th NDP (1996-2000) and was cited again in the 8th NDP (2001-05).

In 2000 the Ministry of Environment, with support from UNDP, initiated a new flagship programme, the National Programme on Environment and Development (NPED), which contained a component on the preparation for and follow-up to the *World Summit on Sustainable Development in Johannesburg in 2002*.

Following guidelines set out in the 8th NPD, Turkish authorities mounted a broad effort to prepare a comprehensive review of Turkey's sustainable development challenges and options. The process involved broad participation by and dialogue among public, private and NGO stakeholders, who came together in roundtables, workshops and consultative events as well as via internet in an "e-group". This process is *still being widely praised for its success in raising awareness* about sustainable development, and as a model for engaging broad public participation in discussions of major environmental issues and events. It produced two highly regarded reports that Turkey submitted to the Johannesburg Summit: a "National Report on Sustainable Development" and a compilation of "Best Practices in Turkey". The latter included an examination of the application of information and technologies for sustainable development under a project funded by the EU-LIFE programme.<sup>a</sup>

### Box 5.2 Sustainable development (*cont.*)

A *National Commission on Sustainable Development* established under the State Planning Organisation with expert groups on energy, forestry, agriculture, and science and technology supported the Johannesburg Summit preparation and follow-up. With UNDP support, an assessment and "next steps" report was issued in 2003 (the "World Summit on Sustainable Development Plan of Implementation"), comparing approaches and intentions set out in a number of important Turkish documents (e.g. the "National Report to Johannesburg"; "National Agenda 21" and "National Programme for the Adoption of the EC Acquis"). The report did not, however, set priorities for follow-up activities.

In its 2004 *Country Evaluation of Turkey*, UNDP observed that the absence of future programme priorities in the 2003 "next steps" report, coupled with lack of funding and a restructuring of Turkey's environmental administration, had resulted in a diminution in public enthusiasm and activity regarding the pursuit of sustainable development after the Johannesburg Summit. At the moment, the country does not have a National Strategy on Sustainable Development, as called for in Johannesburg. On the other hand, the *concept has remained important* in Turkey, focusing attention, within and outside the central government, on the interaction of economic, social and environmental policies and the need to pursue sector integration throughout the planning and implementation process.

What is missing is a dedicated and focused effort on sustainable development by the central government which establishes responsibilities and priorities for ministries, recommends roles and actions for private sector institutions, and engages public participation and support. It would be useful, in this regard, to *establish a ministerial committee on sustainability, supported by a public advisory council*, to re-energize and focus the national effort, and to *ensure strong participation by business, academia and environmental NGOs*. Turkey's Business Council for Sustainable Development also has an important role to play. Among the building blocks for a renewed effort are Turkey's ongoing activities at the provincial level in forestry, energy, water and fisheries in support of the *Millennium Development Goals*, and the *Local Agenda 21* programme with its emphasis on municipal-level participatory mechanisms for decision-making.

a) EU-LIFE (Financial Instrument for the Environment) is an EU financial mechanism supporting environmental and nature conservation projects in the EU and candidate and neighbouring countries. Turkey participated in the Life-Third Country component, which focused on pollution, waste and biodiversity.

MoEF, through its General Directorate of EIA and Planning, is the *competent authority* responsible for assessments, ensuring that administrative and technical procedures are followed and that there are monitoring and inspecting projects before, during and after operation. MoEF also co-ordinates EIA matters with other

government agencies, particularly the Ministry of Health, Ministry of Agriculture and Rural Affairs and Ministry of Culture and Tourism, as well as provincial governors.<sup>8</sup>

Between 1997 and 2004 over 800 EIAs were completed, or an average of 100 EIAs per year. The vast majority of EIAs are undertaken in the more affluent western provinces (Coskun, 2005). Even though MoEF is responsible for implementation and centralises much of the decision-making, the *quality of EIA* procedures and reports varies. In practice, EIA authorisations are often used as an additional permit, added to the number required to develop investment projects. EIAs frequently lack follow-up. Public hearings are limited, and the capacities and expertise of stakeholders vary. Occasionally, EIAs are prepared after the completion of a project. There is considerable willingness to improve the EIA system's performance through: better streamlining with respect to environmental and non-environmental permits; better division of responsibilities between MoEF and provincial environment directorates; and enhanced training through the *EIA Training and Information Centre*<sup>9</sup> at MoEF, created in 2006.

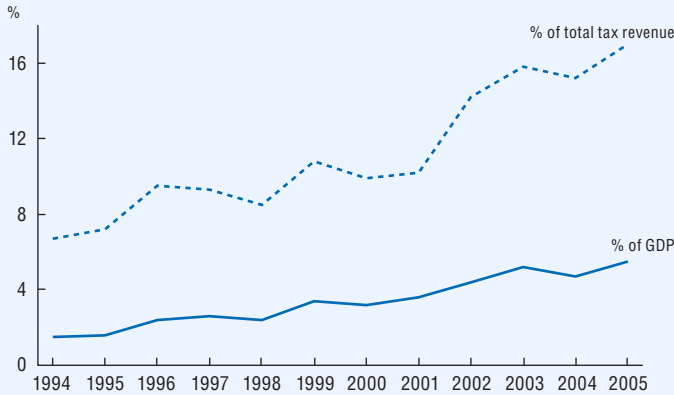
Legislation on *strategic impact assessment* (SEA) of government programmes and plans is in preparation. The draft text gives responsibility to MoEF for supervising the SEA process. The competent authority that commissions the SEA is required to submit the SEA report to MoEF and provide information concerning how SEA conclusions are used (Innanen, 2004).

### 1.3 Sustainable development in practice: market-based integration

A number of steps have been taken by the government in the post-2000 period to *reduce tax distortions, broaden the tax base and improve the efficiency of tax administration*. In June 2002 a special consumption tax was enacted that consolidated many different taxes on some consumption and luxury goods. In April 2003 another tax package on direct taxation was approved by Parliament. With this new law, the system of tax exemption on investments was restructured and simplified, special expenditure reductions were transformed into tax credit, and the system for deducting some expenditure from income tax was simplified and made easier to implement (ENVEST, 2004b).

#### *Environmentally related taxes*

*Environmentally related taxes* represented 15.2% of total tax revenue in 2004, the highest share in any OECD country (the OECD average is 7%) and 4.8% of GDP (the OECD average is 2.6%) (Figure 5.3). These shares had increased significantly from 7.2% of total tax revenue and 1.6% of GDP in 1995. The weight of fuel and motor vehicle taxes in environmentally related tax revenue is very high: 96.5%. The fuel tax itself represents 65% (OECD, 2007).

Figure 5.3 Environmentally related taxes<sup>a</sup> in total tax revenue and GDP

a) Includes transport and energy related taxes.

Source: OECD/EEA database on instruments used for environmental policy and natural resources management.

*Motor fuel taxes* (called “special consumption tax on fuels”) are excise taxes levied on motor vehicle fuels, fuel oil and natural gas. They are among the highest in OECD countries and are differentiated between unleaded gasoline and diesel, with a lower rate for diesel.<sup>10</sup> The consumption tax on gasoline and diesel was introduced in 2002 and its increase over the last five years is associated with a decrease in the use of motor fuels per unit of GDP (Figure 2.3). Given that many low-income households in Turkey do not own a car, this reform has touched middle-income and higher-income households. However, since the tax rate for diesel fuel with sulphur content below 0.05% (EUR 0.52/l) is higher than for fuel with a higher sulphur content (between 0.05 and 0.20%), the wrong incentive is given from an environmental perspective (OECD, 2007). A small tax reduction (2%) is applied to fuels (diesel and gasoline) containing a proportion of biofuel. A lower tax is applied to LPG compared with gasoline and other fuels. For example, in 2007 the LPG tax rate was EUR 0.37/l compared to EUR 0.85/l for low-octane unleaded gasoline. On average, in 2004 taxes represented 69.5 and 61.4% of unleaded gasoline and diesel prices respectively (IEA, 2005).

The special *consumption tax on motor vehicles* is a sub-category of the excise taxes paid on consumption goods such as alcohol, cigarettes and luxury goods. This tax on the purchase of new vehicles ranges between 0.5 and 84% of the vehicle’s net tax price. For automobiles, the tax rate varies according to engine capacity (in 2007, 37% for engines up to 1 600 cm<sup>3</sup>; 60% for those between 1 600 and 2 000 cm<sup>3</sup>; 84%



for those above 2 000 cm<sup>3</sup>). To accelerate the phase-out of old and polluting vehicles (more than 20 years old and not exceeding 1 600 cm<sup>3</sup>), a tax discount was introduced in 2003 and 2004 for the acquisition of a new vehicle (in the same category and with engine capacity not exceeding 1 600 cm<sup>3</sup>) while discarding a vehicle that was at least 20 years old.

The *motor vehicle tax* is paid annually and covers 152 categories of vehicles. While the rate increases with engine power, thus providing a positive signal with respect to the environment, there is a strong negative correlation with vehicle age which can be environmentally counterproductive, as emissions are usually greater in the case of older vehicles. However, changes to this provision are envisaged. To reduce illegal abandonment or scrapping of older vehicles, owners who dispose of vehicles through the appropriate provincial administration are exempted from past unpaid fines and motor vehicle tax.

#### *Environmentally harmful subsidies*

Various types of *financial assistance* are provided by the State to economic entities with an impact on the environment. Some support measures can be environmentally harmful, as they distort prices and resource allocation decisions as well as affecting the amount of goods and services produced and consumed in an economy.

The 1999 *reform of agricultural subsidies* resulted in an initial decrease in the Producer Support Estimate (PSE) by 2001, followed by an increase to 26% of gross farm receipts in 2003-05 (OECD, 2006c). At 3.5% of GDP, the PSE level in Turkey is the highest in any OECD country.

The *structure of agricultural subsidies* has changed towards more environmentally friendly agriculture. The share of input payments (e.g. subsidised prices of those pesticides and fertilisers most likely to have negative environmental effects) decreased from 30% in 1986-88 to less than 2% in 2003-05. There has also been a general shift from market price support to direct income support (DIS) payments since 2001,<sup>11</sup> in line with the “decoupling” objective of the EU Common Agricultural Policy. Nevertheless, low water and electricity prices as well as irrigation subsidies (e.g. electricity for irrigation pumps is 50-60% cheaper than for other uses) are granted to farmers.

Concerning *energy subsidies*, hard coal remains subsidised.<sup>12</sup> As current hard coal prices do not allow Turkish State-owned coal producers to recover costs, they receive the balance as a government subsidy, mainly to cover the cost of labour. The government considers that this subsidy is necessary to promote domestic hard coal production and to diversify energy supply, bearing in mind the objectives of security of supply and social

considerations in the mining regions. Total subsidies paid to coal producers amounted to USD 266 million in 2003 (about 0.05% of GDP). While there is not a large volume of hard coal production in Turkey, aid per tonne of coal equivalent has been relatively high compared with other OECD countries that subsidise coal production.

While Turkish *lignite* producers have not received direct subsidies since 1994, they have been able to cover their costs and make a profit.<sup>13</sup> Until now lignite power plants have had a guaranteed market, but this will disappear when the Turkish Electricity Generation Company (EUAS) is privatised as anticipated in the 2001 Electricity Market Law (IEA, 2005).

#### **1.4 Environmental expenditure and financing**

##### *Environmental expenditure*

*Pollution abatement and control (PAC) expenditure*<sup>14</sup> was estimated at 1.2% of GDP (0.9% public expenditure, 0.3% business expenditure) in 2006, an increase from 1.1% in 1997 (OECD, 2007); private (business) expenditure includes energy saving measures. Since 1997, detailed PAC data are available only for the public sector and thermal power plants; they show a slight increase in public expenditure, mainly due to increased expenditure at municipal level.

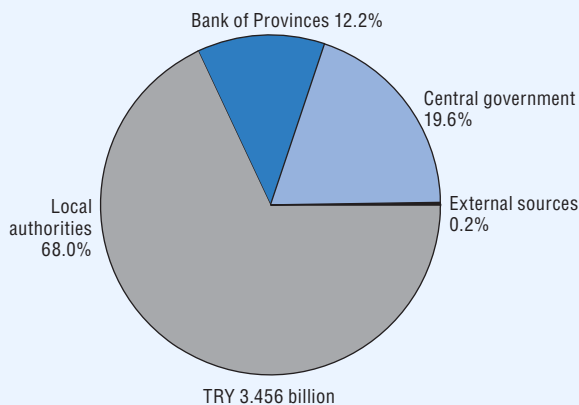
For a number of years *total public investment expenditure* has been around 5% of GDP, with the share allocated to environmental investment declining from 16% in 1999 to 7.5% in 2005.

##### *Financing environmental expenditure*

*Financing of public environmental investment* in 2005 came from four main sources: local authorities (68%), the central government (19.5%), the State-owned Bank of Provinces (İller Bank) (12%) and external sources (e.g. World Bank, EU, GEF and individual donor countries) (Figure 5.4). Municipal revenues (including environmental charges) play an important role in financing investment and environmentally related operating expenditure (Box 5.3).

During the review period, public financing of environmental projects was modified. Until 2002 a large part of public environmental investment was financed from 20 special funds. In 2002 all budgetary and extra-budgetary funds were closed down;<sup>15</sup> central government resources for the environment are now channelled through a single special revolving account in the Central Directorate of Accounting of MoEF (ENVEST, 2004b), besides direct transfers to municipalities (and provinces) and general transfers through the Bank of Provinces. The termination of these funds has significantly reduced allocations earmarked for environmental infrastructure. “Grants

Figure 5.4 Financing public environmental investment, 2005



Source: MoEF.

to municipalities” provided by the central government budget via the Bank of Provinces contribute to the transition (Box 5.4). As part of the post-crisis reform, the number of projects in the overall *public investment programme* was reduced from 5 458 (in 1999) to 3 555 (in 2004). Of the 3 555 projects, 238 provided environmental infrastructure (e.g. waste water treatment plants, sewerage, water supply and solid waste management).

### *Looking ahead*

It is estimated that complying with *EU environmental regulations* will require a total expenditure of EUR 58 billion between 2007 and 2023 (MoEF, 2006). Complying with EU water Directives will require investments accounting for 60% of the total. The central administration is expected to provide 13% of total funding, local administrations 37% (of which 12% by the Bank of Provinces), the private sector 26% and public enterprises 2%. External funding (mostly from the EU) is expected to contribute 22% of total expenditure.

Overall, Turkey faces the challenge of *mobilising financial resources* for environmental improvement, including EU environmental requirements. Some progress has already been made with investment plans for each of the most costly Directives. Further steps need to include i) strengthening the *capacity of provincial and local authorities* to prepare and implement detailed projects; ii) compiling and

### Box 5.3 Sources of municipal revenues

#### *Central government transfers*

Transfers from the central government to municipalities amount to about 2% of GDP. Close to 50% of total municipal revenues are transfers from the central government. These transfers take place through three mechanisms: the first two provide untied general budget support for the municipal administrations, while the third is earmarked for particular purposes. More specifically:

- 6% of national tax revenues is transferred to municipalities according to their population. This represents about 55% of central government transfers to municipalities;
- 4.1% of taxes collected within a province are allocated to a metropolitan municipality if there is one in the province. This represents about 30%. Upon receipt by the metropolitan municipal administration, the transfer is divided into three parts. The largest, 55% (of 30%), goes to the various district municipalities according to population, 35% (of 30%) is allocated to the metropolitan municipality, and the final 10% (of 30%) goes to the Water and Sewerage Administrations (SKIs).
- the remainder, about 15% of transfers, is allocated from the central government budget to a number of ministries and other agencies that in turn allocate funds for (specific) activities in the municipalities. This allocation was previously made through a number of extra-budgetary funds, most of which were eliminated in early 2002 to strengthen the central government budget.

Transfers from the central government to the provincial governments amount to about 0.3% of GDP or 1.12% of national tax revenues.

#### *Local taxes*

About 10% of total municipal revenues come from local taxes: property taxes, the “environment cleaning tax” and taxes on advertising, entertainment, telecommunications, electricity and gas consumption, and fire insurance. Non-metropolitan municipalities and metropolitan district municipalities collect all local taxes. However, metropolitan district municipalities are required to transfer 10% of the solid waste tax and 20% of the property tax to their metropolitan municipalities.

#### *Other revenues*

In addition, municipalities have other revenues representing 25% of total municipal revenues. These include fees for services provided by municipalities such as connection of residential units to municipal networks (e.g. roads, sewerage systems and water pipes). A further 15% of total municipal revenue comes from donations and aid, fines, income from municipal enterprises, borrowing and other sources. There are no legal restrictions on municipalities’ external borrowing. They may borrow on external markets, but only after meeting tight financial criteria and with a Treasury Guarantee.

### Box 5.4 The Bank of Provinces

The *Bank of Provinces (İller Bank)* is an institution affiliated to the Ministry of Public Works and Settlement. It was established as a municipalities bank (Belediyeler Bankası) in 1933, and municipalities have been its shareholders ever since. The Bank's main sources of revenue are: i) annual capital contributions from the local administrations; ii) central government transfer payments; and iii) operating income from commissions, transactions, and banking service revenues and dividends. Currently, the Bank of Provinces carries out three types of activities:

- it serves as a *transfer mechanism* for central government financial payments to municipalities and special provincial administrations. These transfers are generally for the purpose of unconditional budget support for territorial administrations. However, in some exceptional cases transfers may be earmarked for particular (current or investment expenditure) purposes. While transferring central government payments, the Bank has the right to offset transfers against debt service payables to the Bank and/or other agencies of the central government;
- the Bank provides both short-term and long-term *loans* for investments to the municipalities, usually smaller and medium-sized ones, and their utilities;
- on the demand of the municipalities, the Bank provides *technical assistance* to prepare investment projects. These projects include solid waste plants, drinking water treatment plants, water supply, sewerage networks and urban waste water treatment plants. The Bank can also help them develop urban development plans. This technical assistance is financed from the central government grants allocated to the municipalities;
- the Bank also *executes infrastructure projects* through contractors on behalf of the municipalities.

A *reform* of the Bank is underway to increase the efficiency of transferring public funds to municipalities, and to improve the quality and efficiency of municipal investments.

reviewing *public and private financing data* to adjust financing strategies, in light of external resources to be provided by the new EU instruments for accession; iii) the current reform of the *Bank of Provinces* to increase the efficiency of transferring public funds to municipalities and of municipal investments; iv) greater use of *private funding*, including public-private partnership arrangements and foreign direct investment. Finally, during the transition phase of the EU environmental approximation strategy, it will be essential to move progressively towards full application of the polluter- and user-pays principles.

## 2. Implementing Environmental Policy

### 2.1 Institutional framework

#### *Planning and environmental legislation*

In the early part of the review period, the *8th NDP and annual government programmes* (developed by SPO and sectoral ministries) led to priority environmental actions: strengthening the institutional framework for environmental management, upgrading and extending the environmental monitoring and information infrastructure, and establishing an environmental enforcement system (SPO, 2001). The economic crisis of 2000-01 delayed the implementation of some recommendations; progress was slower with the use of economic instruments, removal of environmentally harmful subsidies and actual environmental management (e.g. urban and rural environmental infrastructure, marine and coastal resources, environmental hazards), as well as with the integration of environmental concerns in sectoral policies. The 1999 *National Environmental Action Plan* (NEAP), which contained a number of short- to long-term objectives, was not formally approved, implemented and monitored.

After 2005 and the opening of membership negotiations between Turkey and the EU, efforts to strengthen environmental priorities were undertaken (Box 5.5). The *EU Integrated Environmental Approximation Strategy (2007-23)* (UÇES), prepared by MoEF and adopted by the High Planning Council (February 2007), identified measures to ensure harmonisation and compliance with a large part of the *EU environmental acquis communautaire*. The Strategy included some (but not all) targets for completion of transposition into Turkish legislation, as well as some estimated means (but not those for chemicals, GMOs or noise) of implementing and enforcing the *acquis*. The Strategy estimated that around EUR 60 billion<sup>16</sup> was needed to meet the investment and operational costs of complying with them before 2023 (MoEF, 2006).

This spurred the *updating of large parts of environmental legislation*: overall, 44 new pieces of legislation or major amendments were adopted on horizontal issues (e.g. access to information, environmental impact assessment, environmental inspection) and sectoral issues such as air pollution (e.g. VOC emissions, motor fuel quality, control of air pollution from industrial plants), waste (e.g. hazardous, medical and packaging waste, excavation and construction waste, waste oils, and used batteries and accumulators), water (e.g. drinking and bathing water, urban waste water treatment, nitrates) and chemicals (e.g. dangerous chemicals, phasing out of ODS) (Table 5.2).

### Box 5.5 EU-Turkish relations

#### *Membership negotiations*

Turkey signed the Association (Ankara) Agreement with the then European Economic Community in 1963. This agreement established an association relationship and envisaged the progressive establishment of a Customs Union which would bring the two sides closer together in economic and trade matters. Turkey was recognised as a *candidate state for EU membership* in 1999.

Turkey's accession negotiations started on 3 October 2005. The *screening of Turkish legislation vis-à-vis* the EU *acquis communautaire* was conducted between October 2005 and October 2006. Examination of the Environment Chapter was completed in June 2006.

Between 2005 and 2007, negotiations on six chapters were opened and provisionally completed in one chapter. The negotiations are conducted in accordance with the *Negotiating Framework* adopted by the EU member States, which expresses that these negotiations are based on Article 49 of the Treaty on European Union and that the shared objective of the negotiations is accession. These negotiations are an open-ended process.

#### *EU financial assistance*

Following the 1999 Helsinki European Council, a *pre-accession orientation* was introduced to the EU financial assistance programmes for Turkey. Initially, assistance focused on structural adjustment: EUR 209 million in 2000 and EUR 214 million in 2001 were allocated for Turkey.

In December 2001, the EU Council adopted the "*Framework Regulation for Financial Assistance to Turkey*" with allocations of EUR 126 million in 2002, EUR 144 million in 2003, EUR 236 million in 2004, EUR 277 million in 2005 and EUR 450 million in 2006. Expected average annual allocation for Turkey for the period 2007-10 increases from EUR 497 million in 2007 to EUR 653.7 million in 2010.

Present priorities are to support the reform process, cross-border co-operation and partnerships with the EU Member States. As from 2007, financial assistance is provided through the *Instrument for Pre-Accession (IPA)*, which channels pre-accession assistance to all candidate and potential candidate countries. IPA is divided into five components: institution building, cross-border co-operation, regional development, human resources development and rural development. The novelty of the IPA is that it introduces financial support in new areas (e.g. environment, transport, regional competitiveness, human resource development) managed on the same principles as structural funds.

Table 5.2 Selected environmental laws and regulations

	First enacted	Last ordinance
<b>GENERAL</b>		
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	
<b>AIR</b>		
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 CO <sub>2</sub> 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	
<b>WASTE</b>		
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	
Regulation on the Control of Excavation Soil, Construction Waste and Wreckage No. 25406	2004	
Regulation on Solid Waste Control No. 20814	1991	2005



Table 5.2 Selected environmental laws and regulations (*cont.*)

	First enacted	Last ordinance
<b>WATER</b>		
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
<b>NATURE</b>		
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
<b>INDUSTRIAL POLLUTION AND RISK MANAGEMENT</b>		
Regulation on Control of Air Pollution from Industrial Plants No. 26236	2006	
Law on Organised Industrial Regions	2002	
<b>CHEMICALS</b>		
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
<b>NOISE</b>		
Regulation on Environmental Noise and Management No. 25862	2005	2008

Source: OECD, Environment Directorate.

The legislative changes culminated in a *comprehensive 2006 amendment to the 1983 Law on Environment*. This amendment included the polluter- and user-pays principles, as well as the participatory and precautionary approaches, opening up possibilities for greater use of economic instruments, environmental liability and enhanced public access to environmental information. The amendment specified stricter requirements for municipalities to prepare detailed land use plans and plans for the construction of domestic solid waste treatment facilities. It also introduced higher sanctions for non-compliance with environmental legislation.

Overall, the Turkish environmental legal framework is now *stronger and closer to the EU environmental acquis communautaire*. For example, the regulations concerning packaging waste are fully in compliance with the EU acquis. However, *in some areas transposition is still lacking*, for instance concerning surface and ground water quality, air quality and integrated industrial pollution control, risk management, chemicals management, waste (e.g. landfill), nature and biodiversity protection (e.g. the Birds and Habitats Directives). Particular attention needs to be paid to the transposition of EU standards (European Commission, 2007). There is also a need for a full assessment of the administrative capacity and financial resources required, as well as a detailed plan for further regulatory adjustments.

#### *National environmental administration*

In line with the recommendations of the 1999 OECD review, *environmental institutional capacity* has been strengthened. The Ministry of Environment and the Ministry of Forestry were merged in 2003 to become the Ministry of Environment and Forestry (MoEF).<sup>17</sup> This restructuring was accompanied by the recruitment of additional environmental staff (around 500 between 2003 and 2007) and by additional environmental financial resources. MoEF has 1 200 full-time employees (e.g. 193 dealing with EIA, 475 with inspections) at national level and some additional 4 000 (including some 20% of forest guards) work for the 81 Provincial Directorates. Following government restructuring after the September 2007 elections, MoEF includes the *General Directorate of State Hydraulic Works* (DSI), previously under the Ministry of Energy and Natural Resources, with 27 000 staff<sup>18</sup> in Ankara and in 25 Regional Directorates (DSI, 2007).

*Other sectoral ministries* have authority over certain elements of environmental policy. For example, the Ministry of Agriculture and Rural Affairs is responsible for plant and animal protection in rural areas and for aquatic products; the Ministry of Energy and Natural Resources makes policies related to energy efficiency; the Ministry of Industry and Trade has authority for improving the environmental performance of enterprises and innovation technologies; the Ministry of Public Works and Settlement prepares land use plans for coastal zones; the Ministry of Health has

functions and responsibilities regarding the protection of environmental health; and the Ministry of Culture and Tourism has the authority to protect cultural values and use of coastal zones.

The 2006 amendment to the Law on Environment called for re-establishing the *Supreme Council of Environment* (SCE), which in the past had aimed to ensure the integration of environmental concerns into sectoral policies. Environmental disputes among administrative bodies could also be settled in the Council. The SCE is expected to consist of high-level officials of relevant ministries. Depending on the agenda, representatives of chambers of professions, NGOs, local authorities, universities and scientific institutions would also participate.

*Environmental research* is supported by non-executive scientific institutions. For instance, the Chemistry and Environment Institute at the Marmara Research Center, which is part of the Scientific and Technological Research Council of Turkey (TUBITAK), works on a range of issues including water and waste water, marine waters, solid waste and soils, and air quality. The Institute has received ISO 9 001 and 14 000 accreditation and acquired certified equipment for testing some 200 parameters.

#### *Territorial environmental administrations*

At *provincial level*, the central government is represented by nominated governors (Vali). Branch offices of government bodies have extensive executive and oversight roles. MoEF is present with 81 Provincial Directorates of Environment and Forestry (PDEFs), which prepare regional land use and nature protection plans, issue permits (land use, construction, environmental, hunting), lead inspection activities and manage the provision of environmental services. The Bank of Provinces (Box 5.4) plays an important role at territorial level as the principal lender to local government for infrastructure development.

Within the framework of policies set by national and provincial authorities, *municipalities* carry out responsibilities for planning, provision and control of services to the population (including those related to solid waste, water, sewerage and transport) as well as the preparation and adoption of land use plans (i.e. provincial and municipal).<sup>19</sup> Municipalities come together in associations to provide waste collection, water and sewerage services. These are provided directly through semi-autonomous companies or through concessions (Chapter 3). The municipalities are also responsible for managing sites of historical or natural importance.

Although municipal and village councils are run by elected representatives, they operate within the limits established by central authorities,<sup>20</sup> mainly to ensure *co-ordination*, uniformity of public services and compliance with the law. These limits,

however, may prevent the application of flexible and less costly solutions. For example, authorisation procedures may become complicated and extensive if various agencies (and often even each department within an agency) establish their own supervisory requirements. The provincial Local Environmental Committees, which bring together representatives of the provincial offices of various ministries, mayors and business representatives, are expected to contribute to the identification of environmental problems and negotiate solutions, but their role has not been significant so far.

Recent policies aim to disengage the State from carrying out many functions and to devolve management authority to the local level. The 9th NDP states that the government would withdraw from the production of goods and services and strengthen its policy-making, regulatory and supervisory functions (SPO, 2006). Further *devolution* of management responsibilities according to the subsidiarity principle should allow better use of the potential of elected authorities and more flexible and cost-effective solutions. Devolution should be accompanied by the provision of adequate means, including funding, to fulfil policy objectives and support procedures for reporting to the public and to higher authorities on policy implementation.

## 2.2 Regulatory instruments

### *Reforming environmental permitting for industrial operations*

Steps are being taken to simplify and rationalise *permitting processes*. The 2003 amendment to the regulation on “unhealthy establishments” clarified responsibilities between MoEF and the Ministry of Health related to the environmental and health dimension of permits. A further aim is to regroup permitting procedures for all media,<sup>21</sup> with a limited time frame for authorities to issue a package of permits. For large enterprises, this would be in line with the EU IPPC Directive. For small enterprises, it would be managed by binding rules for specific sectors. New procedures would be introduced parallel with new limit values and standards required by EU legislation. The *permitting reform* envisages the establishment of a Turkish IPPC Centre. This Centre is expected, inter alia, to gather and disseminate information about integrated permitting and to provide training to permit writers and permitting authorities.

In practice, the present permitting procedures are often perceived as burdensome by the regulated community. Some estimates suggest that 60% of installations may operate *without appropriate environmental permits*; a significant number of enterprises operate with temporary permits only (IMPEL, 2005).

*Progress in enforcement and compliance assurance*

In the past, enforcement of environmental legislation did not attract sufficient attention and there was only a basic framework for environmental inspections, lacking capacities, impacts and transparency. The *2002 Regulation on Environmental Inspection* was an important step towards enhancing environmental compliance assurance in order to respond to non-compliance and create a deterrent effect. Today MoEF is responsible for emissions control, and the Ministry of Health (which historically undertook many environmental management functions) for sanitary and epidemiological inspections. The Ministry of Labour and Social Security oversees indoor workers' health and safety.

The establishment of a *Directorate for Inspections in MoEF* in 2002 introduced the separation of inspections for compliance from permit writing. It also introduced a more comprehensive approach to compliance assurance: the Directorate is now responsible for co-ordination of enforcement efforts (e.g. preparation of guidelines on inspections, approval of the annual programme of inspections prepared by the Provincial Directorates, training); its *inspectors* conduct "combined inspections" (inspection of a single installation for compliance with all relevant environmental legislation) while those of the Provincial Inspection Departments of PDEFs carry out media-based inspections of all facilities in their province. Since the Provincial Inspection Departments are formally subordinate to the governor's office (and not the central inspectorate of MoEF), enforcement officers may face pressure to balance economic and environmental protection goals.

*Local police forces* (jandarma) may be involved in environmental inspection in rural areas. They have the right to inspect permits and to notify the Provincial Directorates in cases of non-compliance. They also take part in responding to emergency situations involving industrial accidents. They play a role in the prosecution of cases identified by DSI where illegal abstractions or exceedance of limits are recorded.

Concerning *nature conservation*, inspections are carried out by the nature protection staff of the Provincial Directorates, as there is no dedicated unit at the national or provincial levels. The national and provincial staff of the Special Protected Areas Institution also has inspection responsibilities within their area of expertise. Forest areas are controlled by MoEF's General Directorate for Forestry, which has a guard service attached to the Provincial Directorates.

Additional *human resources* have been provided for enforcement purposes. In 2006 there were 280 inspectors in the various departments of MoEF, including 17 in the Department for Inspections. There were also 850 inspectors in the

Provincial Directorates. The forestry services staff makes up about 20% of total PDEF staff. However, given the size of the country and the number of installations subject to inspection, it is estimated that 200 to 300 additional inspectors should be employed to meet requirements (IMPEL, 2005). Enlargement of the enforcement staff should be accompanied by the establishment of an integrity system for inspectors, regular training and evaluation of their performance.

While there were general provisions for environmental *non-compliance sanctions* in the 1983 Law on Environment, the 2002 Regulation on Environmental Inspection introduced more detailed definitions of environmental non-compliance cases, increased the level of fines, and differentiated them according to the nature and seriousness of the environmental crime. The 2006 comprehensive amendment to the Law on Environment introduced a more specific provision in the Turkish Penal Code related to breaching environmental regulations.<sup>22</sup> The amendment also introduced *compliance promotion* provisions (e.g. the possibility of applying a discount of up to 50% to the tariff for electricity used in treatment plants).

In 2005 MoEF and the provincial authorities carried out 25 combined inspections, while the provincial authorities carried out over 30 000 media-specific inspections. The inspectors can impose administrative sanctions: in 2005 total *fines* for non-compliance reached EUR 15 million and the *closure* of 280 installations was ordered. However, the general trend is to provide a written *enforcement warning* to the facility. To date, no complete data on inspections have been collected and published. From 2007, Provincial Directorates have an obligation to prepare *reports on inspection activities* and submit them to MoEF with the aim of receiving guidance on enforcement measures.

### *Other permits and licences*

MoEF issues other types of permits and licences, including *approvals of fuels* for use in energy production (coal, oil and gas). Approvals are based on tests for standard parameters carried out by laboratories authorised by the National Reference Laboratory. In the case of coal, for example, calorific value, humidity, ash, sulphur and volatile content are evaluated before the permit is issued. MoEF issues permits for the disposal of appropriately treated and certified *sewage sludge* on agricultural or forest land. Such permits, renewed every year, are subject to approval by the relevant local authority.

MoEF also gives licenses to firms that collect, separate and recycle *waste* on behalf of other firms subject to the deposit-refund quota system. Several types of *water management* permits are issued. For example, abstraction rights are issued by

DSI after allocations are made for use of surface water, including for hydropower, irrigation and municipal use in urban areas.

Provincial and municipal authorities prepare *urban development plans* within their jurisdictions. Detailed land use plans, and subsequently *building permits*, are under the responsibility of municipal authorities.<sup>23</sup> Start-up and operating permits are issued upon inspection by the respective administrations (municipalities, special provincial administrations, or the management body of an Organised Industrial Zone). These have replaced the previous Ministry of Health “unhealthy establishments” permits. There is also a requirement for operation permits upon completion of construction. These are issued by the respective administrations under urban planning legislation (IMPEL, 2005).

### *Environmental monitoring*

Several steps have been taken over the review period to increase the coverage and policy relevance of the *environmental monitoring and reporting system*. For example, in 2006 MoEF assigned the principal role in *air quality monitoring* to the General Directorate of the State Meteorological Service<sup>24</sup> for collecting and collating information on air emissions and quality. The air monitoring network has expanded, benefiting from the efforts of Provincial Directorates and universities. All the provinces now have at least one automatic measurement station for SO<sub>2</sub> and PM<sub>10</sub>, part of the national Air Quality Monitoring Network. In addition, mobile air quality monitoring vehicles have been introduced and a national reference laboratory (under MoEF) is being accredited with support of the Marmara Research Centre.

During most of the review period, responsibility for *water monitoring* was shared among several institutions: DSI and its 1 200 measurement stations across Turkey; MoEF and its Provincial Directorates; and the Ministry of Agriculture and Rural Affairs, responsible for monitoring nitrate pollution in freshwater and groundwater. The inclusion of DSI in the MoEF structure (in 2007) provides opportunities for efficiency gains in monitoring water quantity and quality. *Ad hoc* environmental information is also gathered by universities and research institutions as part of their research projects.

However, the overall system is fragmented and needs further improvement, including to support standard establishments and accreditation and to support some policy decisions concerning industrial zones or coastal tourism areas (with the notable exception of Organised Industrial Zones, where emissions and discharges are monitored by their management bodies). The establishment of a *Department for Environmental Inventory at MoEF*, responsible for co-ordinating monitoring efforts, goes in the right direction.

The *laboratory network* includes public and private laboratories. A national reference laboratory (associated with MoEF and supported by TUBITAK's Chemistry and Environment Institute) is in the process of accreditation and development. The Institute, which appears to have well developed capacities in the air, water (seawater and freshwater), soils and waste sectors, also leads intercalibration activities in the field. Universities and private laboratories exist in many parts of the country. All Organised Industrial Zones have their own laboratories.

At the sub-national level, Provincial Directorates of Environment and Forestry produce periodic *state of the environment reports* according to standard formats provided by MoEF. All data related to water quality, waste water and waste generation, air quality, greenhouse gas emissions and environmental expenditure are collected by the Turkish Statistical Institute (TurkStat), which published nation-wide environmental statistics compendium in 2004 and 2006. In 2007 MoEF published a comprehensive state of the environment report covering all environmental media and presenting sectoral pressures on the environment (Chapter 6).

### 2.3 *Economic instruments*

Turkey is the OECD country with the largest revenues from environmentally related taxes, both when measured as a per cent of GDP or as a per cent of total tax revenue (Section 1.3). Petrol taxes are the highest in the world. However, the Turkish environmental policies overall are based on regulations, with limited use of other economic instruments, such as *user charges and pollution fees*. All charges principally serve revenue raising purposes. The 2006 amendment to the 1983 Law on Environment (Article 3) states, however, that "... to encourage the protection of the environment and the prevention and elimination of environmental pollution (...), economic instruments and incentives, such as emissions and pollution charges, and market-based mechanisms such as carbon trading shall be used".

Concerning *waste management*, charges on solid waste generation are collected by municipalities mainly to contribute to covering the costs of municipal waste collection and disposal.<sup>25</sup> Commercial and industrial sources pay a fixed annual charge based on the type and size of the facility, while households pay a fixed lump sum together with the water bill.<sup>26</sup> The environmental effectiveness of the charge is questionable, as it is not linked to the actual amount of waste generated and covers only a portion (about 15%) of the collection and disposal costs (ENVEST, 2004). The tariff structure is distorted, as industrial plants pay a lower rate than facilities such as schools. The charge rates should be revised, aiming at covering the full cost of disposal and providing an incentive effect to reduce waste generation.



The *deposit-refund system* is also used in waste management. The Regulation on the Management of Solid Waste requires packaging waste (paper, metal, plastic and glass) to be collected after disposal and recycled according to annual quotas. MoEF licenses firms that collect, separate and recycle waste on behalf of other firms that are subject to the quota system. These firms are responsible for keeping records of all the packaging material processed in their plants and have to submit this information to the Ministry periodically. The deposits are returned to those who bring empty containers back to the retailers or wholesalers of the product.

A *charge for hazardous waste treatment* (including treatment of clinical and industrial waste) has been designed to finance the operations of the only dedicated hazardous waste disposal facility (the Izaydas plant located in Izmit).<sup>27</sup> The charge is based on the volume and type of waste delivered to the facility. The rates cover the full operating costs. The capital costs of the plant have been covered by public funding. The effectiveness of the charge is limited, as it is imposed on the small proportion of hazardous waste that is actually delivered for treatment.

Concerning *water management*, a charge on water use and connection to sewers is designed to contribute to cover water supply and waste water disposal costs. Rates are fixed by municipalities; until the revision of the Law on Environment in 2006, a requirement that the level of the waste water charge should not be higher than 50% of the payment for drinking water supply severely undermined the financial and economic rationale of the system. This limitation has been eliminated, and the amended law calls for establishing rates that reflect the marginal social costs. Fees are also applied in the case of waste water discharges by industries unable to operate their own waste water treatment plants for certain periods.<sup>28</sup> The fee provides an incentive for industries to build and operate treatment plants and to reduce pollution.

Concerning *air management*, 20% of the regular inspection cost for motor vehicles feeds MoEF's revolving fund (budget line). There are also tolls (according to vehicle size and the distance travelled) for the country's main highways and a fee (according to vehicle size) paid for crossing either of the two bridges connecting Asia and Europe in Istanbul. Other economic instruments are applied in regard to *noise*<sup>29</sup> and *hunting*. The implementation of tradable emission quotas is currently not foreseen.

*Environmentally related financial assistance* is available in the form of exemptions from import duties and from the value added tax for purchases of environmental equipment and for environmental R&D and investment. Financial assistance is also available in the form of interest support (with a maximum of TRY 300 000) for investment credits and discounts on energy tariffs (up to 50%) for

pollution treatment and abatement facilities. Although the amount of these subsidies seems limited, they are not consistent with the polluter-pays principle, especially as no time limits are assigned to the subsidy schemes.

#### 2.4 *Private sector initiatives*

Private sector initiatives to improve *environmental management* and reduce environmental impacts have been increasing. The number of enterprises certified for ISO 14 000 grew rapidly, from 91 in 2000 to over 1 400 in 2006; this was especially relevant in the case of those exporting to EU markets.<sup>30</sup> The Turkish Accreditation Agency and the Turkish Institute for Standards (TIS) have been working on the development of industry standards to address waste generation and management problems, as well as air and water pollution. In total 512 standards on the environment (out of which 131 are national and 381 internationally adopted) are in force.<sup>31</sup> TIS provides training to industry and experts and carries out environmental audits. Up to 2007, TIS provided 465 experts with “EMS Auditor/Lead Auditor” training. Technical studies to establish EMAS<sup>32</sup> are being initiated. Eco-labelling is not yet developed, though pioneering work has been done in the textile and leather industries.

*Voluntary approaches*, initiated and co-ordinated by the Turkish Business Association, have continued in the cement, chemical and automobile industries. Initiatives focus on meeting high environmental standards. Cleaner production initiatives have been applied through the joint efforts of universities and enterprises in the textile, olive oil production, dairy, leather and electroplating sectors. Most initiatives have focused on small and medium-sized enterprises (SMEs) with the greatest potential for water and energy savings. Some assessments concerning olive oil production have led to 95% reductions in waste water generation. Firms in the chemical industry have been implementing the Responsible Care programme and cleaner production training programmes, particularly in SMEs.

*Organised Industrial Zones (OIZs)* play an important role in industrial development. They provide many services (e.g. infrastructure, security services, legal advice) to enterprises located within a limited geographical area.<sup>33</sup> At the end of 2007, 107 OIZs had been established, covering a total of over 22 000 ha. Many OIZs (such as the one in Gebze, near Kocaeli) were established with the aim of reducing pollution caused by dispersed industrialisation around urban areas. The management of OIZs assists enterprises in their contacts with the environmental administration, arranging environmental permits and meeting other requirements. OIZs also provide environmental infrastructure, including water supply, waste water collection and treatment, waste disposal and emergency response. In addition, they

play an important role in strengthening environmental management in enterprises. Even though their operations focus on firms with foreign capital, sharing the OIZs' experience should be of value across Turkey, particularly for SMEs.

## 2.5 *Natural disasters and technological accidents*

Turkey is prone to *natural disasters* such as earthquakes, floods, landslides, avalanches and forest fires. *Earthquakes* are the most serious threat, as most of the country is located along active geological fault lines: the North Anatolia fault, corresponding to the southern shore of the Black Sea, and a variety of faults in the western Aegean region and in south-eastern and eastern Anatolia. 92% of the country's territory is prone to earthquakes and 95% of the population lives in these areas. Over the last 25 years, more than 25 000 people have died and nearly 100 000 buildings have been damaged beyond repair as a result of earthquakes (Table 5.3). One of the most disastrous earthquakes in recent history struck north-western Turkey on 17 August 1999, with estimated damages of USD 13 billion (Bibbee, *et al.*, 2000) (Box 5.6). Measured in terms of direct economic costs, natural disasters have, on average, accounted for 1% of GDP per year, with earthquakes representing 0.8% of GDP. Landslides account for over 25% of Turkey's natural disasters; events and floods for over 10%. Other disasters include rock slides (8.2%) and avalanches (1.2%).

Turkey also has a recent history of *technological accidents*. In 1999, the Eastern Marmara earthquake caused the release to the atmosphere of 200 metric tonnes of hazardous anhydrous ammonia,<sup>34</sup> an explosion of tanks containing 6 400 tonnes of toxic acrylonitril, a spill of 50 tonnes of diesel fuel into Izmit Bay due to damaged fuel-loading equipment, and a fire involving 700 000 tonnes of oil stored at the TUPRAS oil refinery. It took several days to bring the fire under control, and large quantities of toxic gases were released, while the Marmara Sea was affected by a sizeable oil spill (Steinberg, 2001; Perkins, 2002). In 2004, a fire broke out in the naphthalene tanks at the ATAS refinery in Mersin. There were no casualties, but the fire lasted for several days and caused significant air pollution. Sea operations have also resulted in accidents. For example, in July 2002 a large LPG tanker caught fire and exploded during pumping operations at Izmit. This triggered the explosion of nine other tanks at the facility, and 300 tonnes of LPG burned. Traffic through the Turkish Straits remains very high, entailing substantial risks despite remarkable preventive efforts (Chapter 7).

Co-ordination of *responses to emergencies* is vested in the General Directorate of Emergency Management (TEMAD) within the Prime Minister's office, which is supported by the General Directorate of Disaster Affairs (GDDA) of the Ministry of

Table 5.3 Major earthquakes, 1982-2005

Date	Place	Magnitude	Deaths	Buildings damaged
27.03.1982	Bulanik	5.2	..	1 000
30.10.1983	Horasan	6.8	1 155	3 241
18.09.1984	Balkaya	5.9	3	187
05.05.1986	Sürgü	5.8	8	824
06.06.1986	Sürgü	5.6	1	1 174
07.12.1992	Akyaka	6.9	4	546
13.03.1992	Erzincan	6.8	653	6 702
01.10.1995	Dinar	5.9	94	4 909
05.12.1995	Pülümür	5.6	..	..
14.08.1996	Mecitözü	5.4	145	707
22.01.1997	Hatay	5.5	1	1 841
27.06.1998	Ceyhan	5.9	145	10 675
17.08.1999	Izmit/Marmara	7.4	17 127	50 000
12.11.1999	Duzce	7.3	798	20 503
06.06.2000	Orta-Çerkeş	5.8	12	2 456
15.12.2000	Bolvadin-Afyon	5.6	6	250
03.02.2002	Afyon/Sultandagi	6.0	2 500	4 401
27.01.2003	Tunceli Pülümür	5.8	250	100
01.05.2003	Bingöl	6.4	1 000	7 800
25.03.2004	Askale-Erzurum	5.1	10	1 212
02.07.2004	Eastern Turkey	5.1	18	531
25.01.2005	Mere-Hakkâri	5.4	3	83
20.10.2005	Seferihisar	5.9	..	100

Source: UNEP (2007), MoEF (2007).

Public Works and Settlement. GDDA develops natural disaster response policies and provides training for personnel involved in disaster management through the European Disaster Training Center in Istanbul. The General Directorate of Civil Defense (GDGD), which is part of the Ministry of Interior, the Turkish Red Crescent Society (TRCS)<sup>35</sup> and the armed forces play major roles in rescue and relief operations. The first line of response to technological accidents is provided by the security and firefighting services at the affected installations. The Undersecretary of Maritime Affairs is responsible for marine environmental protection operations and MoEF is responsible for coastal environmental protection (Peynircioglu, 2002).

Following the adoption of laws on natural disaster management in 2003, MoEF was charged with the preparation of emergency plans and management of chemical and major industrial accidents. Information on establishments where there is a risk of

### Box 5.6 The 1999 eastern Marmara earthquakes

#### *The earthquakes and their impacts*

On 17 August and 12 November 1999, two earthquakes struck the Marmara and Bolu regions of Turkey, causing material damage and human casualties. The *August event* (7.4 magnitude with an epicentre near the town of Gölcük in Kocaeli province) lasted for 48 seconds, killing over 17 000 people, injuring 24 000 and leaving approximately half a million homeless. Between 50 000 and 120 000 houses were damaged beyond repair and another 50 000 were heavily damaged (57% of the overall housing infrastructure). The death toll increased in winter because of the poor conditions of shelters for survivors. The earthquake was heavily felt in the industrialised areas around the Marmara Sea, which account for one-third of Turkey's overall output: 58 industrial facilities in the Kocaeli region alone suffered moderate to heavy damage, and many facilities reported releases of hazardous substances. The *November event* (7.3 magnitude, epicenter Düzce) resulted in 798 deaths, 4 948 injuries and 20 000 collapsed or heavily damaged housing units.

#### *Post-earthquake reconstruction efforts*

Immediately after the earthquakes, the government provided *emergency assistance* to those whose homes had been damaged in the form of tents, temporary residences and rubble clean-up. During recovery and rehabilitation, the government also provided funds to help homeowners to purchase *new residences*. Temporary residences were constructed by the Ministry of Public Works and Settlement and the General Directorate of Disaster Affairs, or using donations by foreign agencies and others. Over time, new permanent residences have been built for the owners of severely and moderately damaged residences with the support of long-term low-interest loans.

The *post-earthquake rehabilitation programme* introduced measures to reduce potential losses from natural disasters by: improving the emergency response system; increasing the earthquake resistance of new buildings; adopting and enforcing land use plans and building codes; and setting up a compulsory disaster insurance scheme. The programme also increases public awareness of earthquakes, preparedness measures by businesses, and support programmes for small businesses. In addition, the Turkish Emergency Management Directorate (TAY) has been created and the Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP) initiated with the assistance of the World Bank.

#### *Land use planning*

The 1985 regional land use plan for the eastern Marmara area underlined the potential negative impacts of seismic risks on industrial and residential development. Prior to this plan in 1982, the Bank of Provinces had prepared a geological report on

**Box 5.6 The 1999 eastern Marmara earthquakes (cont.)**

these risks in the area, highlighting the lessons learned from the 1967 earthquake. It suggested areas most suitable for settlement and industrial development. In practice, however, the *planning principles were often ignored*: multi-storey buildings covered much of the city, except in a few traditional neighbourhoods. Industrial plants were located in areas vulnerable to earthquakes. After the earthquake, the majority of collapsed buildings were multi-storey, whereas low structures (of one or two storeys) were undamaged.

Following the reconstruction efforts, the *new land use planning* process was initiated for the cities of the eastern Marmara region, taking into account geological conditions. The plan for the new earthquake-safe housing areas of Adapazar was prepared, with its implementation to be monitored to prevent non-compliance with the safety principles. The plan selected suitable sites for new residential development to the north of the city, and building codes have been revised. Detached houses of only up to three storeys have been constructed, and housing plots are separated from each other by wide streets and include vast green areas.

major accident hazards is collected by the Emergency Preparedness Commission. The 2006 comprehensive amendment of the Law on Environment makes the preparation of *emergency plans* to control and decrease the negative effects of industrial accidents compulsory. These plans are co-ordinated with the Local Emergency Plan for Major Industrial Accidents, prepared by provincial governments. Information on establishments where there is a risk of major accident hazards is collected by the Local Emergency Case Preparation Committees. A form in Turkish has been developed in compliance with the “OECD Industrial Accidents Notification/Reporting Form” and has been available on the website of MoEF. After a major industrial accident, this form is filled in and sent to MoEF by Provincial Directorates. The 2006 amendment also requires facilities with potential environmental risks that may affect third parties to be insured to cover *financial liabilities*. In cases where industrial operations are evaluated as posing a threat to public health in case of an accident, MoEF can deny an operational permit or close the facilities temporarily or permanently.

Turkey is in the process of harmonising its legislation with the *EU Seveso II Directive*.<sup>36</sup> A regulation on control of major industrial accident hazards has been drafted and is currently under discussion with stakeholders. In addition, a communiqué (on public information, safety reports/emergency plans and notification)

has been prepared and an information system for industry developed. MoEF has been designated a competent authority, sharing responsibility for implementation of the Directive with the Ministry of Labour and Social Security. The full implementation of the Seveso II Directive will require approximately EUR 131 million in public funding and EUR 167 million in private funding (EC, 2007).

Even though industrial operators are required to compile and regularly update a wealth of technical information concerning hazardous materials (consistent with the Seveso guidelines), *emergency preparedness and response* could still be improved. Information about accidents may not be readily available to all first-line response forces.<sup>37</sup> There are no established procedures to identify the principal command at on-site emergency response operations. While the overall authority and responsibility lie with the governor of the affected region, it is not clear to whom this authority is delegated during response to specific accidents that involve different actors. There may be an over-reliance on the capacity of the personnel of industrial installations to manage large-scale accidents, and on the role the army can play in such situations (UNEP, 2007). The establishment of an expert commission to support the implementation of natural and industrial accident legislation could help to address the major problems, including institutional co-ordination, preparation of guidelines and availability of appropriate equipment. The entire emergency system would also benefit from regular drills and simulations.

## Notes

1. In the 1990s Turkey's economy suffered from "boom-and-bust" cycles, with banking and economic crises in 1994, 1999 and 2000. The consequences of the 2000 crisis were severe: devaluation of the currency by some 50% on a single day, a jump in nominal interest rates to 100%, the virtual collapse of the banking system and the bankruptcy of a number of enterprises. At the end of 2001 GDP had declined by nearly 8%, inflation was about 70% and the net public debt to GDP ratio exceeded 90%.
2. While inflation fell steadily, from 85% in 1998 to 29.7% in 2002, the economic reform brought it down to single digit level in 2004 for the first time in three decades. It dropped to 7.7% in 2005, but climbed back to 9.8% in 2006.
3. SPO serves as the secretariat of the High Planning Council.
4. The other key objectives include i) increasing employment, ii) strengthening human development and social solidarity, iii) ensuring regional development and iv) increasing quality and effectiveness in public services.
5. The Ministry of Energy and Natural Resources includes renewable energy resources among the priorities of energy policies, particularly in energy production. It is estimated that the hydrologic energy potential economically available is 130 000 GWh annually, but that only 35% of this potential can be utilised.
6. EIA procedures are guided by lists of activities included in annexes to the latest EIA regulation. Projects listed in Annex I require a full EIA regardless of circumstances. For projects listed in Annex II MoEF decides on a case-by-case basis whether an EIA is required, based on several "selection and elimination" criteria stipulated in Annex IV, which includes requirements for descriptions of the site itself, the nature of the project, the potential impacts on the environment and the potential alternatives. Annex V, a listing of areas classified as "sensitive" in Turkey, must also be taken into account in the screening process. Preparing such descriptions is referred to as a preliminary EIA report ("pre-EIA").
7. Annexes I and II of the recently introduced EIA regulation reflect Annexes I and II of Directive 97/11/EC, but the regulation does not envisage consulting neighbouring countries if the proposed project may have transboundary impacts. In addition, Turkey has not signed the UNECE Espoo Convention.
8. MoEF is responsible for procedures concerning all Annex I projects, and may delegate responsibility for the Annex II process to the provincial environment directorate where the Ministry deems it has the professional competence to deal with applications. Until 2007, such delegation had been granted to 30 of the 81 provinces.
9. The Centre provides relevant information to stakeholders, facilitates communication and coordinates research activities on EIA methodologies. Supporting documents, such as the EIA manual and guidelines, have been developed to standardise EIA procedures and to provide guidance on EIA procedures and reporting. For example, three sectoral guidelines for carrying out EIAs related to highways, hazardous waste and harbours have been prepared.
10. Leaded gasoline was banned on 1 January 2004.
11. The DIS programme has made annual payments of around USD 90/ha to all farmers on the basis of their cultivated area.



12. While the selling price of hard coal to iron and steel producers was USD 100 per tonne and was USD 39-40 per tonne for power generation, the production cost of hard coal was USD 187 per tonne. Prices are renegotiated every year with major users.
13. The production cost of lignite is currently about USD 20 per tonne. The average selling price is about USD 28; the price of lignite sold for power generation is lower, at USD 23 per tonne.
14. According to OECD/Eurostat definitions (OECD, 2007c), pollution abatement and control (PAC) expenditure includes activities aimed directly at the prevention, reduction and elimination of pollution (e.g. waste, water, air, noise, R&D, administration). Environmental protection expenditure (EPE) includes PAC and the protection of biodiversity and landscape. Both PAC and EPE include public and private expenditure.
15. The only exceptions were: the Price Support and Stabilisation Fund, Savings Deposit Insurance Fund, Defence Fund, Privatisation Fund, Social Solidarity Fund, and Promotion and Publicity Fund.
16. This did not cover costs in the areas of chemicals, GMOs or noise. Investment and operational costs in these areas are being developed.
17. The Ministry's three General Directorates, covering media-specific issues (DG for Environmental Management), horizontal policies (DG for EIA and Planning) and natural environment issues (DG for Nature Protection and National Parks) play a role in the practical implementation of environmental legislation. In addition, autonomous institutions are supervised by the Minister of Environment and Forestry: i) the Special Environmental Protection Institution, responsible for planning and development control in 14 special protection zones under the Mediterranean Action Plan of the Barcelona Convention; ii) the State Meteorological Service; and iii) the General Directorate for Forest Management, responsible for the protection, development and sustainable utilisation of forests. The General Directorate of State Hydraulic Works (DSI) was incorporated in the MoEF structure in 2007.
18. Out of 27 659 DSI personnel in 2006, 1 505 were administrative, 4 512 technical, 21 378 manual workers and 264 other.
19. There are 3 225 municipalities in Turkey, of which 16 are (larger) metropolitan municipalities. The municipalities' elected councils manage a range of services (some compulsory and some at the discretion of the council). The 16 metropolitan municipalities have two-tier authorities, including a council with elected representatives and nominated representatives of the lower-tier (ordinary) municipalities and villages they cover. Some 35 000 elected village councils have responsibility for the provision of services to settlements with a population of up to 2 000.
20. This relation is stated in the present Constitution, Article 127, paragraph 5: "The central administration has the power of administrative trusteeship over the local governments."
21. Currently, separate permits are required for releases of pollutants to air, surface water or sewerage, waste disposal and noise. Separate permits are also required for construction of industrial facilities starting their operations and after an operational trial period. For example, installations emitting air pollutants are subject to preliminary and full permits. Preliminary permits have limited time validity and are issued prior to operation, based on design characteristics and expected emissions. Full permits are granted after a trial period of operation.
22. For example, a new provision allowed criminal sanctions of up to two years of imprisonment for deliberately discharging wastes or garbage to soil, water or air with damage to the environment.

23. However, the land use/site development permit in the Organised Industrial Zone or special tourism zone is obtained from the respective management bodies.
24. An autonomous structure subordinated to MoEF.
25. 10% of the revenue from these charges is earmarked for MoEF.
26. The so-called “environment cleaning tax” rates are fixed independently by each municipality.
27. There are plans, however, to build up to six new hazardous waste treatment facilities.
28. The so-called “pollution prevention charge” applies to all industries, whether or not they discharge to the sewerage network.
29. An aircraft noise charge is calculated as 0.5% of the passenger ticket price, and at a predetermined rate per tonne of freight.
30. For example, the Izmir KOSGEB Eco-textile Laboratory was certified to ensure that Turkish textile industry products were compatible with international environmental standards.
31. The TIS established national committees that follow international and regional standardisation activities (namely ISO/TC and CEN/TC).
32. Regulation 2001/761/EC.
33. There is at least one OIZ in each Turkish province. The OIZs operate according to legislation from the year 2000, under the Ministry of Industry and Trade. The Council of Ministers appoints the legal entity that manages the OIZs.
34. The release was deliberate, in order to avoid the explosion of an over-pressurized tank after the loss of refrigeration capabilities.
35. TRCS has the capacity to address 250 000 people's needs in emergencies by providing temporary shelter and food.
36. 1996/82/EC.
37. For example, firefighters may not have consistent access to information on a hazardous installation affected by an emergency due to unclear procedures for activation of crisis centres.

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## Signs

The following signs are used in Figures and Tables:

.. : not available

– : nil or negligible

. : decimal point

\* : indicates that not all countries are included.

## Country Aggregates

OECD Europe: All European member countries of the OECD (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey and United Kingdom).

OECD: The countries of OECD Europe plus Australia, Canada, Japan, the Republic of Korea, Mexico, New Zealand and the United States.

Country aggregates may include Secretariat estimates.

## Currency

Monetary unit: New Turkish Lira (TRY)

1998: TRY 0.260 = USD 1

2007: TRY 1.305 = USD 1

2007: TRY 1.789 = EUR 1

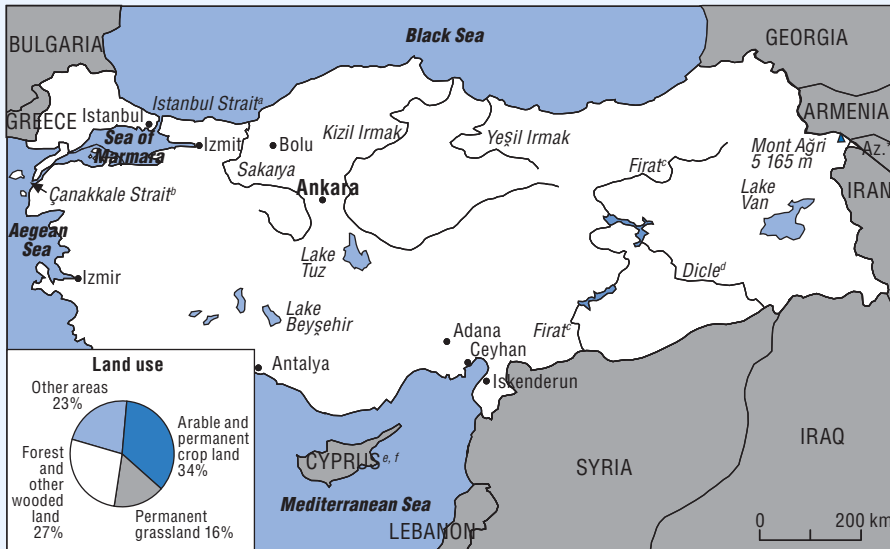
## Cut-off Date

This report is based on information available up to 31 May 2008.

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Map of Turkey



\* Azerbaijan.

a) Bosphorus.

b) Dardanelles.

c) Euphrates.

d) Tigris.

e) Footnote by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

f) Footnote by all the European Union member States of the OECD and the European Commission: The Republic of Cyprus is recognized by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: OECD.



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