Please cite this paper as:

OECD (2008), "Eco-Innovation Policies in Turkey", Environment Directorate, OECD.

Country profiles on policies to support environment-friendly innovation

Eco-Innovation Policies in Turkey

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FOREWORD

The report is part of a series of country profiles on eco-innovation policies developed for eight non-EU OECD members: Australia, Canada, Japan, Korea, Mexico, New Zealand, Turkey and the US. Country profiles are based on extensive desk research and on field missions in selected countries (Canada, Japan, Korea, the US). Country experts have commented earlier drafts of their country profile.

This series complements the eco-innovation roadmaps developed by EU member countries under the Environmental Technology Action Plan. It provides an empirical basis for further investigation on policies to support eco-innovation.

A short introduction presents the background for this series of country profiles, including the methodology, and a brief overview of some of the instruments identified.

The country profiles were drafted by Xavier Leflaive, under the supervision of Brendan Gillespie. Carla Bertuzzi has provided data and information on measurement issues and has drafted selected sections. IEEP was commissioned for the initial desk research and preliminary identification of policy issues. Country experts have provided most valuable inputs, in terms of time, information and policy relevance: Warren Hughes (Department of the Environment, Water, Heritage and the Arts, Australia), Javier A. Gracia-Garza (Environment Canada), Graham Campbell (Natural Resources Canada), Tim Karlsson (Industry Canada), Noriko Kishimoto (Ministry of the Environment, Japan), Kyu-Shik Park (Ministry of Environment, Republic of Korea), Carlos Muñoz Villarreal (Ministry of Environment and Natural Resources, Mexico), Vera Power and Alison Stringer (Ministry for the Environment, New Zealand), David Widawsky (USEPA), Sebahattin Dokmeci (Ministry of Environment and Forestry, Turkey).

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INTRODUCTION

Background

This report is part of the OECD work programme on eco-innovation policies.

The ambition of this report is to provide an empirical inventory of policies in place in Turkey to promote eco-innovation. Considering that European countries had developed roadmaps for eco-innovation policies in the context of the European Commission Environmental Technology Action Plan (ETAP), the secretariat prepared an inventory of eco-innovation policies in eight non-EU OECD countries (Australia, Canada, Japan, Korea, Mexico, New Zealand, Turkey and the US). A similar project for China is published separately.

The objective of this work is to complement the knowledge base on eco-innovation policies in OECD countries and to provide empirical material for additional research on policy issues related to eco-innovation. The outline of each country profile is similar to that of ETAP roadmap, to facilitate comparison.

The work was implemented in coordination with country delegations, which have identified experts in each country who could provide additional information and review initial drafts of the country profile of their country.

A consultant (IEEP, Brussels, Belgium) has been commissioned to collect all information publicly available in English on eco-innovation policies in each of the eight non-EU OECD members. Field missions have been organised by the country experts in four countries (Canada, Japan, Korea, the US). During these missions, the secretariat met with the agencies identified and selected by the country expert. Draft country profiles have been developed on the basis of desk research and field missions. They have been reviewed by national experts and revised accordingly. All country profiles present information which was up-to-date at the end of 2007. In most cases, more recent information has been taken into account.

Policy instruments to support eco-innovation

The country profiles confirm that eco-innovation policies deploy a variety of instruments. They have to adjust to the features of the domestic economy, in particular the knowledge base, the size of domestic markets, and the *vigueur* of the venture capital industry.

In most non-EU OECD countries, public research and development (R&D) remains a major orientation. The US and Japan typically allocate significant public finance to environment-related R&D. However, three trends have emerged: i) some countries are concerned by the competition and trade issues related to such support; ii) public resources are increasingly channelled via Departments not directly in charge of environment policies (Energy, Agriculture, Transport), making inter-agency cooperation even more necessary; iii) the role of research organisations is being redefined, to intensify

linkages with the private sector and stimulate the development of marketable outputs; incubators in the US, or the National Institute of Advanced Industrial Science and Technology's (AIST) Technology Licensing Office in Japan illustrate innovative arrangements in this area.

Attracting private funds to finance environmental R&D is another major policy orientation. The main issue is to reduce risks for private investors investing in environmental R&D projects, while making sure that public money is used effectively and does not crowd out private initiatives. A variety of funds have been established to reduce risks to private investors (e.g. Sustainable Technology Development Canada-SDTC in Canada), or incubators (e.g. The Clean Energy Alliance in the US, Environmental Technology Business Incubator in Korea). Measures are taken to stimulate the venture capital industry and to provide incentives for environment-related projects; e.g. this is the role of the Environmental Venture Fund in Korea.

Environment-related performance standards are being set with the aim of stimulating innovation in goods and services. Such standards are pursued in particular in the field of energy and resource efficiency. However, standards may provide disincentives and can only have a lasting positive effect on innovation if they are timely revised. Schemes such as the Top Runner programme in Japan aim to address this challenge.

Market-based instruments are burgeoning in non-EU OECD Countries. A number of new projects and initiatives have been identified at national or local level. One interesting case is the all-encompassing Emission Trading Scheme envisioned in New Zealand, where equitable sharing of responsibility across sectors and stakeholders is based on the principle of equity across sectors.

There is some evidence that, besides environmental policy instruments and regulation, soft instruments such as voluntary commitments, eco-audits and eco-labels play a role as determinants of innovative behaviour in firms. Voluntary initiatives can become mandatory over time (cf. Stand-by Korea). Industry initiatives abound and, in particular contexts, can change the relationship between the administration in charge of environment policies and the business sector. This is illustrated by Performance Tracks in the US, where the US Environmental Protection Agency (USEPA) and firms enrolled in the programme construct a collaborative relationship. This typifies what can be seen as a new phase in environmental policies which sets out to promote broader sustainability, rather than address one single environmental issue. In that perspective, governments rely less on regulatory tools and endeavour to work with industries, in sectors which use materials and/or energy.

In line with the OECD Council Recommendation on Improving the Environmental Performance of Public Procurement [C(2002)3], green procurement initiatives are burgeoning at local and national levels. Guidelines are supported by websites, green products databases, and *pro forma* requests for tenders. The Green Purchasing Network is an international network active in this area.

Some initiatives set out to promote technologies and products developed by one country. Others try to alleviate barriers to the deployment of environment-friendly technologies and products; shared definitions, standards and labels contribute to a level playing field for the creation and diffusion of environment-friendly technologies, products and life-styles. Such efforts are still plagued by institutional problems related to intellectual property rights and international monetary transfers. Typically, the capacity of a national agency to (financially) support one country's side of a multinational joint venture depends on how countries will share the intellectual property rights. Few cooperation projects reach developing countries (with the exception of East Asia, and China in particular).

COUNTRY PROFILE OF TURKEY

Introduction and country definitions of eco-innovation

Definitions related to eco-innovation used in the country

No definition of eco-innovation has been found.

Institutions playing a major role on eco innovation

Supreme Council for Science and Technology (BTYK)

The Supreme Council of Science and Technology was set up in 2003 and became fully operational in 2004. It was established to determine, direct and co-ordinate research and development policies in the field of science and technology towards the targets of economic development, social progress and national security. Among its tasks, the Council is responsible for assisting the Government in identifying long-term science and technology policies, determining R&D targets related to science and technology, identifying priority R&D areas and preparing related plans and programmes[1].

Scientific and Technological Research Council of Turkey (TUBITAK)

TUBITAK was established in 1963 to organize, coordinate and encourage basic and applied research, especially in natural sciences. The Council funds research carried out by public research organisations and the private sector, and conducts research through its own research institutes. Furthermore, TUBITAK develops national science and technology policies and proposes them to the Supreme Council of Science and Technology for approval[2]. TUBITAK is the governmental institution managing the highest share of resources to finance research and innovation projects, including initiatives related to environment.

http://www.tubitak.gov.tr/home.do;jsessionid=21362B531560A7E2EA55DE9C921CB2A3?ot=10&lang=en

Ministry of Energy and Natural Resources (MENR) (http://www.enerji.gov.tr/)

The MENR is responsible for the formulation of national energy policies and the supervision of their implementation[3].

1 http://cordis.europa.eu/erawatch/index.cfm?fuseaction=org.document&uuid=7D87CB5D-C15F-4146-A9D50E13997288C4

2 http://cordis.europa.eu/erawatch/index.cfm?fuseaction=org.document&uuid=7D87CB2E-9020-CDD4-359E187364837434

3 http://www.turkishweekly.net/comments.php?id=2513

Electrical Power Resources Survey and Development Administration (EIE)

(http://www.eie.gov.tr/english/index-e.html)

EIE was founded in 1935 and is bound to the Ministry of Energy and Natural Resources. Among its tasks, EIE is in charge of researching new and renewable energy sources, undertaking surveys and studies on energy efficiency and raising awareness on energy conservation. EIE is also responsible for the implementation and coordination of the energy efficiency programmes, and is the National Energy Conservation Centre (NECC).

Policy documents related to eco-innovation

This section provides information about a selection of relevant documents.

Vision 2023

The National Research and Technology Foresight Programme (Vision 2023 Programme) was elaborated in 2002 under the coordination of TÜBITAK. The Programme covers the period 2003-2023 and aims to: build long-term science and technology objectives; determine strategic technologies and priority areas for R&D; formulate science and technology policies for the next 20 years; and create public awareness of the importance of science and technology.

Energy and natural resources are some of the areas included in the Programme. The following priority topics for energy are mentioned: clean coal technologies; fuel cells for transport, stationary and portable applications; wind energy technologies; hydrogen combustion technologies; electricity production from solar energy; energy storage technologies; hydropower plants (mini and micro); nuclear energy; control technologies for power systems; energy conservation technologies in industry; reduction of energy consumption; and using renewable energies in buildings[4].

http://forlearn.jrc.es/guide/6_examples/turkey2023.htm and
http://www.tubitak.gov.tr/home.do?ot=5&rt=3&sid=0&cid=3332

State Planning Organization: Ninth Five Year Development Plan (2007-2013)

The plan analyses the state of play and the future objectives for Turkey in the area of competitiveness, employment, human development, development and effectiveness in public services. Among its key development objectives the plan includes, under the 'increasing competitiveness' axis: improving the energy and transportation infrastructures; protecting the environment and improving the urban infrastructure; improving R&D and innovation (including on hydrogen and fuel battery technologies); and improving efficiency of the agriculture structure

http://ekutup.dpt.gov.tr/plan/ix/9developmentplan.pdf

Policies, Initiatives and instruments – a national inventory

This chapter summarises the main initiatives undertaken in Turkey to foster environmental innovation, according to the information available in English in governmental and other official web sites. Currencies are in Turkish Lira, in US Dollar or in EU Euro.

4 IEA, 2005

Research and Development

Most R&D initiatives on science and technology are funded and/or co-ordinated by TUBITAK (see http://www.tubitak.gov.tr/home.do?ot=1&sid=991&pid=547). Environmental technologies and initiatives can hence be funded through this channel, although funds are often not explicitly targeted to eco-innovation in particular.

Funds and initiatives that are most directly related to environmental technology R&D include:

- Coal Bed Methane Mitigation Research;
- Working groups on energy technologies;
- Support Programme for Scientific and Technological Research Projects;
- Pilot projects on alternative transport fuels; or
- Initiatives taken by the Ministry of Environment and Forestry.

Coal Bed Methane Mitigation Research

The General Directorate of the Turkish Hard Coal Enterprises (TKK) of the Turkish Government tendered a project of Research and Processing of Coal Bed Methane to identify best technologies in mitigating methane emissions during coal extraction and subsequent energy production[5].

Working groups on energy technologies

Under the co-ordination of TUBITAK, working groups have been established to define technological options linked to energy efficiency and renewable energy. One of the major objectives of all the working groups is to assess available energy solutions and determine possible deployment strategies for new and renewable energy sources. As a result of these studies, a strategy will be prepared and submitted to the Prime Minister's High Council of Science and Technology for approval[6].

Support Programme for Scientific and Technological Research Projects

This programme started in 1994 and is managed by TUBITAK. It is built to support research generating new information, doing scientific interpretation or solving technological problems, and projects having advanced technology applications. Its aim is to increase the national competitive capacity in international market within the framework of prioritized areas. Co-operation between the research community and the private sector is encouraged. 'Environment' is among the 12 research themes. The overall budget (for all themes) was €121 million for the period 2004 to 2006[7]. This also includes a variety of instruments to support R&D, with an emphasis on partnerships, international networks and incentives for technology suppliers.

5 http://www.iea.org/textbase/pm/?mode=cc&id=2455&action=detail

6 http://www.iea.org/textbase/pm/?mode=cc&id=729&action=detail

7 http://cordis.europa.eu/erawatch/index.cfm?fuseaction=prog.document&UUID=7D87B748-D847-0DDE-1ED2DE38E3C5ED96&hwd=

Pilot projects on alternative transport fuels

Two demonstration projects are under way by the Istanbul Technical University (ITU) and Marmara University on the use of compressed natural gas (CNG) in public buses. The ITU project demonstrates the use of hybrid vehicles and the Marmara University project the conversion of engines for the use of natural gas[8].

Research under the Ministry of Environment and Forestry

The Ministry has a Research and Development Department. This Department supervises the activity of laboratories. For instance, eleven Forestry Research Institues established in the various regions of Turkey, carry out research and development studies both on regional and national level. Research projects cover all kinds of forestry and address environmental subjects according to needs and demands of the Ministry. Some of the most important ones include:

- Within the context of climate change, studies on tree/shrub species that are resistant to drought/freze and salinity,
- The employability of treatment sludge at forestation activities,
- Forestation which are suitable for new conditions occuring near thermal power plants,
- Studies on fast growing species, for the purpose of supplying the demand of wood to decrease pressures on natural forests.

Performance Targets

Performance targets initiatives include:

- Energy Efficiency Law - No. 5627
- Labelling of Household Electrical Appliances
- Energy Efficiency in Public Buildings and Street Lighting
- Regulation on Heat Insulation in Buildings
- Labelling of Passenger Car Fuel Economy and CO2 Emissions
- Industrial Air Pollution Control Regulation
- Gasoline and Diesel Oil quality Regulation

Energy Efficiency Law - No. 5627

The Energy Efficiency Law, adopted in 2007, set forth measures for energy efficiency in energy generation, transmission, distribution and consumption phases at industrial establishments, buildings, power generation plants, transmission and distribution networks and transport. The law also aims to

8 IEA, 2005

raise energy awareness in the general public, and to promote and increase the use of renewable energy sources.

(http://www.eie.gov.tr/english/announcements/EV_kanunu/EnVer_kanunu_tercume_revize2707.doc)

Labelling of Household Electrical Appliances

Since February 2003, the Ministry of Industry and Trade requires the energy labelling of refrigerators, washing machines, dryers, dishwashers, electric ovens and lamps[9].

www.sanayi.gov.tr

Energy Efficiency in Public Buildings and Street Lighting

In 2000, the Turkish government developed plans that impose savings in power use in government buildings and cut-down on street lighting[10].

Regulation on Heat Insulation in Buildings

Turkey adopted mandatory standards for heat insulation in new buildings in 1985. In 2000 the Regulation on Heat Insulation in Buildings set more stringent limits for annual heating energy requirements of buildings – differentiated according to climatic zones. While, according to the previous standards, buildings heating required about 200-250 kWh/m^2, the new standards[11] were expected to bring down heating energy requirements to 100-150 kWh/m^2. This regulation also obliges new buildings to possess an energy certificate that shows their energy consumption per square metre and cubic metre. At the end of 2005, the Turkish Parliament approved amendment to the Regulation to align it with EU Directive 2002/91/EC on the minimum energy efficiency of buildings[12].

Labelling of Passenger Car Fuel Economy and CO2 Emissions

In December 2003 the Turkish government approved regulations for passenger cars on the basis of EU Directive 1999/94/EC on the mandatory labelling of vehicle fuel economy and CO2 emissions. From January 2008 on, the Turkish standards require passenger vehicles to display labels classifying cars by their comparative fuel efficiency and carbon dioxide emissions per kilometre. To further help consumers choose climate-friendly vehicles, a free consumer guide to fuel economy and CO2 emissions[13] is available.

Industrial Air Pollution Control Regulation

Standards exist for the emissions of NO_X, SO_2, CO and particulate matter (PM) from combustion plants. PM and CO standards have been lowered compared to 1986 levels. According to Air Quality Protection Regulation of 1986, PM limit concentrations are 150 mg/m3 for new facilities and 250

9 http://www.iea.org/textbase/pm/?mode=cc&id=977&action=detail

10 http://www.iea.org/textbase/pm/?mode=cc&id=515&action=detail

11 http://www.iea.org/textbase/pm/?mode=cc&action=detail&id=593

12 http://www.iea.org/textbase/pm/?mode=cc&id=2458&action=detail

13 http://www.iea.org/textbase/pm/?mode=weo&id=2454&action=detail

mg/m3 for old facilities. In 2006 regulation, the limit value for PM is 100 mg/m3 for both old and new facilities (for combustion plants, rated thermal input ≥ 50 MW). In order to comply with the regulation, lignite-fired power plants are being equipped with flue gas desulphurisation (FGD) technology. Electrostatic precipitators (ESP) are also being installed to reduce PM emissions.

The regulation also sets penalties for non compliance with emission standards and gives the Ministry of Environment and Forestry responsibility for plant authorisation and enforcement[14].

Gasoline and Diesel Oil Quality Regulation

The regulation, passed in June 2004, aims at harmonising the Turkish gasoline and diesel oil standards with EU standards as set in Directive 2003/17/EC. A transitional period is allowed between 2007 and 2009 – shorter than the one allowed by the EU Directive, which started in 2005[15].

Mobilisation of Financing

This section refers to financial instruments that do not promote specific phases of technology development, but finance environmental innovation in general – e.g. funds which finance technology from cradle to grave. In some cases environmental innovation is not the main objective of the initiative, but is part of wider projects. Such financing initiatives include:

- Energy-Environment in Turkey;
- World Bank Renewable Energy Project.

Energy-Environment in Turkey

Within the framework of the Project 'Energy-Environment in Turkey', studies analysing alternative scenarios for the reduction of GHG emissions originated from activities taken in co-ordination with the World Bank in 2000. The project involved the Ministry of Energy and Natural Resources, the Electricity Generation Corporation and the Turkish Electricity Transmission Corporation. First, the 'base case' scenario for current projections for energy demand and supply has been studied and CO2 emissions were estimated. Others scenarios involving various alternatives, such as increasing energy efficiency, improving fuel quality, application of advanced technologies, transmission and distribution losses, etc., are being analysed[16].

World Bank Renewable Energy Project

In 2004, the World Bank approved a US $202 million (about €163[17]) Renewable Energy Loan for Turkey, closing in 2010. A term lending facility has been established and is operated by two Turkish financial intermediaries - the private Turkish Industrial Development Bank (TSKB) and the public Turkish Development Bank (TKB) - which make loans to qualified private sponsors of renewable energy generation projects. In order to support the implementation of the Project, Ministry of Energy and Natural Resources (MENR), General Directorate of State Hydraulic Works (DSI) and General Directorate of Electric Power Resources (EIE) are also meant to undertake various institutional

14 IEA, 2005

15 IEA, 2005

16 http://www.iea.org/textbase/pm/?mode=cc&id=798&action=detail

17 Average exchange rate in 2004: 1US$ = 0.805 EUR

development activities. The main objective of the project is to increase privately owned and operated power generation from renewable sources such as hydro and wind. See:

http://web.worldbank.org/external/projects/main?pagePK=104231&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P072480

Market-based Instruments and State Aid

Market based instruments supporting eco-innovation in Turkey include:

- Electricity Market Licensing Regulation;
- Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy.

Electricity Market Licensing Regulation

The Electricity Market Licensing Regulation of the Electricity Market Law (No. 4628) promotes the use of renewable energy by requiring the legal entities applying for licences for construction of renewable energy facilities to pay only 1% of the total licence fee. In addition, renewable-based generation facilities are exempt from paying the annual licence fees for the first eight years from completion. The Turkish Electricity Transmission Company (TEIAS) and/or distribution companies are also required to give priority status to the connection to facilities based on renewables[18].

Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy

Enacted in 2005, this law (No. 5346) aims to expand renewable energy resources (RES) for generating electricity, reduce greenhouse gas emissions, protect the environment and develop the manufacturing sector for renewable-energy related products. RES certified electrical energy can be purchased by legal entities holding retail sale license on the basis of bilateral agreements[19]. The law provides transitional arrangements (until 2011) for more competitive prices for electricity generated from plants that have a renewable energy resource certificate, and other incentives for investments in renewables (determined by the Council of Ministers). Furthermore the law gives the Council of Ministers the authority to increase the price applicable to renewable energy resources by a maximum 20% at the beginning of each year. The renewable energy law is a first step towards implementation of the *acquis* on renewables. However, the law does not set a target for electricity generated from renewable sources by 2010[20]. See:

http://www.eie.gov.tr/english/announcements/YEK_kanunu/LawonRenewableEnergyReources.pdf

In addition, the Energy Efficiency Law, passed in 2007, establishes renewable electricity purchase obligations. Renewable electricity purchase price ranges between 0.05 and 0.055 €/kWh[21].

18 http://www.iea.org/textbase/pm/?mode=cc&id=1650&action=detail

19 http://www.iea.org/textbase/pm/?mode=re&id=2475&action=detail

20 European Commission (2005b)

21 http://www.iea.org/textbase/pm/?mode=re&id=2457&action=detail

Procurement

No policy on green procurement has been implemented yet. According to the European Commission Screening Report on Turkey, the integration of environment considerations in procurements is foreseen, in light the EU Acquis requirements[22].

Awareness raising and training

Awareness raising and training initiatives include:

- Industrial energy manager courses;
- EIE/NECC awareness raising initiatives.

Industrial energy manager courses

Industrial energy manager courses began in 1997, with the support of the Japan International Cooperation Agency (JICA). Among other things, this project involved technical assistance on industrial energy efficiency, equipment donations, the establishment of an Energy Efficiency Training Centre, building a model plant and improving the energy manager courses. The US$ 2.1 million model plant was opened in October 2001. A course on energy efficiency management has been organized by EİE and JICA in the context of the "Third Country Training Program" and took place in November 2007.

See: http://www.eie.gov.tr/english/announcements/GI-20070917.doc

EIE/NECC awareness raising initiatives

The EIE/NECC has a number of activities for raising awareness on energy efficiency in industry. These include operating a training bus, providing free publications, preparing technical manuals for energy managers, organisation of national and international conferences, seminars and workshops, and granting energy conservation awards to companies[23]. A public awareness project on energy efficiency in buildings was programmed in 2005[24] and had a total budget of € 1.07 million[25].

Acting Globally

In addition to the ones already mentioned, a number of initiatives benefit from international support. These include:

- Turkey-United States Economic Partnership Commission Action Plan;
- Energy Conservation in Industry;
- Energy Efficiency in Buildings in Erzurum;

22 European Commission, 2005 (Chapter 5 – Public procurement)

23 IEA,2005

24http://ec.europa.eu/enlargement/fiche_projet/document/PF%202005%2003.08%20Energy%20Efficiency.pdf

25 European Commission, 2007: EU Energy Policy and Turkey. MEMO/07/219

- Environmental Improvement Projects;
- IEA Implementing Agreements;
- Other funds for energy efficiency;
- EU 6th Framework programme;
- UNFCCC and carbon transactions.

Turkey-United States Economic Partnership Commission Action Plan

In the context of the Turkey-United States Economic Partnership Commission Action Plan, the U.S. Department of Energy will work with the Turkish Ministry of Energy and Natural Resources to co-sponsor and co-host a workshop on clean coal technologies, or energy efficient/earthquake resistant housing technologies[26].

Energy Efficiency in Buildings in Erzurum

GTZ, the German organisation for technical assistance, provided technical assistance to the project on 'Energy Efficiency in Buildings in Erzurum'. The project, implemented in 2002–2005, had the following components: capacity building of EIE/NECC and Erzurum municipality, energy managers training, other target group trainings, demonstration projects; and legislative review concerning the building sector at both national and local level[27].

Environmental Improvement Projects

The project, by the German cooperation bank KfW (Kreditanstalt für Wiederaufbau), started in 2003 and provided SMEs with funds for energy saving investments with due consideration to the environmental performance of industrial companies[28].

IEA Implementing Agreements

Turkey participates in a number of Implementing Agreements in the context of the IEA Framework for International Technology Co-operation, such as: Energy conservation in buildings and community systems programme (ECBCS), Energy conservation through energy storage, Energy technology systems analysis programme (ETSAP), Hydrogen, and Photovoltaic power systems[29].

Other funds for energy efficiency

Various international organisations and donors, such as the United Nations Industrial Development Organization (UNIDO), the World Bank, the EU, the GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit) and the Japan International Cooperation Agency (JICA) have provided

26 http://turkey.usembassy.gov/news_052507.html

27 http://ec.europa.eu/enlargement/fiche_projet/document/TR%200303.06%20Improvement%20of%20energy%20efficiency.pdf

28 http://ec.europa.eu/enlargement/fiche_projet/document/TR%200303.06%20Improvement%20of%20energy%20efficiency.pdf

29 IEA, 2005

financing for energy efficiency projects and programmes in Turkey. These activities were mostly technical in nature and focused on energy audits, staff training and energy efficiency policy development[30].

UNFCCC and carbon transactions

As a member of the OECD, Turkey was included among the Annex I and II countries when the UNFCCC was adopted in 1992. In 2001 Turkey was removed from the list of Annex II countries, but remained on Annex I - with an accompanying footnote specifying that Turkey enjoys favourable conditions. Furthermore, Turkey was not given a quantified emissions reduction target in the Kyoto Protocol, as it was not a party of the UNFCCC by the time the protocol was adopted in 1997. Turkey enacted the UNFCCC in 2004, but has not yet signed the Kyoto Protocol; hence it is not eligible for CDM and JI. Turkey though can undertake carbon transactions with other countries. The first transaction took place in 2006, when a German company purchased Verified Emission Reductions (VERs) certificates from a Turkish wind power plant project[31].

Country Synthesis

Trends in R&D expenditure in Turkey

Historically Turkey has made limited investments, as a percentage of GDP, in research and development (including environmental innovation). More emphasis though was put on R&D after 2005, as more ambitious objectives for investment were set - although lower than the EU Lisbon target. Security of energy supply was identified by the government as one of the main objective for the national R&D activities. A number of initiatives hence are targeted on renewable sources and energy efficiency.

The Gross Expenditure on Research and Development (GERD) as a percentage of GDP was 0.72 in 2001, 0.66 in 2002[32] and 0.67 in 2004[33].

In 2005 Turkey decided to gradually increase the GERD as a percentage of GDP to 2 per cent in 2010, to increase private expenditure on R&D as a percentage of GERD from 28.7% (2002) to 50% and to raise the number of full-time equivalent researcher from around 24,000 up to 40,000, all within the same period of time[34]. The 2 per cent objective though is still below the EU Lisbon target of 3 per cent GERD/GDP. According to the OECD data, the share of GERD financed by industry is decreasing, from 41 to 38%.

Due to this increased commitment in R&D, the research funds during the 2000-07 period increased significantly, from €106 million in 2000 to €761 million in 2007. The total amount of funds allocated for 2005, 2006 and 2007 is €2249 million as opposed to €1077 million set aside for five

30 IEA,2005

31 http://www.3c-company.com/en/press-events/press-releases/press-release/news/2006/07/10/first-turkish-carbon-transaction-between-bilgin-energy-and-3c-climate-change-consulting.html

32 OECD, 2007: Country statistical profiles 2007 http://stats.oecd.org/wbos/viewhtml.aspx?queryname=334&querytype=view&lang=en

33 European Commission, 2006

34 European Commission, 2005 (Chapter 5 Science and research)

years between 2000 and 2004[35]. The figures also indicate a sharp increase in TÜBITAK's industrial research and development support (€54 million in 2004, up from €25 million in 2000). The number of bilateral agreements on cooperation in science and technology, with a total of 60 countries, reached 100[36].

Lessons learnt

Turkey is in the process of becoming a candidate to the EU, and hence in the position to transpose and implement the EU *acquis*. This leads to a significant amount of uptake of environmental technologies and systems (although not necessarily 'innovative' compared to EU standards), as Turkey needs to put in place or renovate environmental infrastructures – like water and waste water systems, waste facilities - transport infrastructures, etc. Potential EU accession is one of the most important drivers for the uptake of these innovations in Turkey.

The Supreme Council for Science and Technology (BTYK) and Scientific and Technological Research Council of Turkey (TUBITAK) are key institutions to set long term strategies, co-ordinate and carry on research and development initiatives in science and technology.

A number of initiatives set energy efficiency standards, especially in buildings. Many initiatives are also focused on water resources, both for electricity production (small and large hydro) and for resource use efficiency (e.g. irrigation), water being a scarce resource in Turkey. Turkey has a large potential for renewable sources (especially hydro, solar, geothermal).

Many initiatives on environmental innovation enjoy the support of other industrialised countries (like Japan and Germany) through technology transfer, training and international conferences. Also, the potential candidature to enter the EU gave Turkey access to EU pre-accession funds. Some infrastructural projects have also benefited from World Bank loans.

35 http://cordis.europa.eu/erawatch/index.cfm?fuseaction=ri.content&topicID=329&countryCode=TR&parentID=50

36 European Commission, 2005b

Appendices

Summary table

Actions	Initiatives
Research and Development	Coal Bed Methane Mitigation Research Working groups on energy technologies Support Programme for Scientific and Technological Research Projects
Performance Targets	Energy Efficiency Law - No. 5627 Labelling of Household Electrical Appliances Energy Efficiency in Public Buildings and Street Lighting Regulation on Heat Insulation in Buildings Labelling of Passenger Car Fuel Economy and CO2 Emissions Industrial Air Pollution Control Regulation Gasoline and Diesel Oil quality Regulation
Mobilisation of Financing	Greater Southeastern Anatolia Project (GAP) Turkey Emergency Flood Earthquake Rehabilitation (TEFER) Energy-Environment in Turkey World Bank Renewable Energy Project
Market-based Instruments and State Aid	Electricity Market Licensing Regulation Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy
Awareness Rising and Training	Industrial energy manager courses with JICA EIE/NECC awareness raising initiatives
Acting Globally	Regional Environmental Center (REC) Turkey initiatives Turkey-United States Economic Partnership Commission Action Plan Industrial energy manager courses – with JICA (ch. 2.6) Energy Conservation in Industry Energy Efficiency in Buildings in Erzurum Environmental Improvement Projects IEA Implementing Agreements Other funds for energy efficiency EU 6th Framework programme UNFCCC and carbon transactions
Other initiatives	Road Transport Law no 4925 Pilot projects on alternative transport fuels

Reference and data sources

The sources of information and contact details related to this report are listed below.

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European Commission: Standard Summary Project Fiche - Project number: TR 05 03.08 (http://ec.europa.eu/enlargement/fiche_projet/document/PF%202005%2003.08%20Energy%20Efficiency.pdf)

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http://www.oecd.org/dataoecd/9/56/35297981.pdf