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Republic of Turkey:
**Institutional Review of
Energy Efficiency**



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Republic of Turkey: **Institutional Review of Energy Efficiency**

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Acronyms and Abbreviations

ADEME	Agence de l'Environnement et de la Maîtrise de l'Energie (French Environment and Energy Management Agency)
BEE	Bureau of Energy Efficiency (India)
CDM	clean development mechanism
CO ₂	carbon dioxide
dena	Deutsche Energie-Agentur GmbH (the German Energy Agency)
DOE	designated operational entity
DSM	demand-side management
EE	energy efficiency
EECB	Energy Efficiency Coordination Board
EED	Energy Efficiency Department
EIE	General Directorate of the Electric Power Resources Survey and Development Administration
EMRA	Energy Market Regulatory Authority
ESCO	energy service company
ESMAP	Energy Sector Management Assistance Program
ESP	energy service provider
ESPC	energy saving performance contracting
EST	Energy Saving Trust (United Kingdom)
EU	European Union
GDI	General Directorate of Industry
GDEA	General Directorate of Energy Affairs
GDEE	General Directorate for Energy Efficiency (proposed option)
GDP	gross domestic product
GDRE	General Directorate for Renewable Energy (within MENR)
GHG	greenhouse gas
HOA	homeowner association
IEA	International Energy Agency
IFI	international financial institution
ISA	independent statutory agency
KEMCO	Korea Energy Management Corporation
KOSGEB	Small and Medium Enterprise Development Organization (Turkey)
M&E	monitoring and evaluation
M&V	measurement and verification
MRV	measurements, reporting and verification
MENR	Ministry of Energy and Natural Resources
MoD	Ministry of Development
MoEc	Ministry of Economy
MoEd	Ministry of Education
MoEU	Ministry of Environment and Urbanization
MoSIT	Ministry of Science, Industry and Technology
NEEA	National Energy Efficiency Agency (South Africa)
NEEAP	National Energy Efficiency Action Plan



PPP	public-private partnership
RE	renewable energy
SEAD	Super-energy-efficient appliance deployment
SME	small and medium enterprise
TA	technical assistance
TMOBB	Turkish Union of Chambers of Engineers and Architects
TOBB	Turkish Union of Chambers and Commodity Markets
toe	(metric) ton of oil equivalent
TSE	Turkish Standards Institute
TTGV	Technology Development Foundation of Turkey
Tubitak	Turkish Scientific and Technological Research Institution
TurkStat	Turkish Statistical Institute
U.K.	United Kingdom
UMT	Union of Municipalities of Turkey
U.S.	United States



Executive Summary

Introduction

If Turkey is to continue its trajectory of economic growth in a sustainable manner, energy efficiency (EE) will be of critical importance. Recognizing this, the government of Turkey now considers EE a key component of both its energy strategy and its National Climate Change Strategy and Action Plan.

Over the past 5-10 years, Turkey has made considerable advances in establishing a strong policy and legal framework, creating a robust institutional set-up, and developing programs to support EE implementation. From an institutional standpoint, since 1981 the General Directorate of the Electric Power Resources Survey and Development Administration (EIE) had been mandated with EE policy making, implementation and promotion; in 2007 an Energy Efficiency Coordination Board (EECB) was established under the 2007 EE Law to coordinate various EE policies, programs and related efforts. Finally, in November 2011 EIE was converted into the General Directorate for Renewable Energy (GDRE) and absorbed into the Ministry of Energy and Natural Resources (MENR).

Objectives and Approach

In 2013, in consultation with the Turkish government, the World Bank conducted an EE institutional review with the objective of improving Turkey's ability to manage EE policies and programs, thus helping it meet its stated national EE targets. The review involved a detailed assessment of the current institutional set-up, including the roles and responsibilities for EE in Turkey along with a comparison with international experience and best practices. This is the review's final report, and as such it contains a final set of institutional options and recommendations.

Assessment of Functions and Responsibilities

The report team based its assessment of Turkey's institutional roles and functions on two things: a review of existing laws and documents and a set of interviews with public and private sector stakeholders. The result was then analyzed across four major areas—policy, data and information, incentives and technical assistance, and monitoring and evaluation—to identify current responsibilities, gaps in relation to international best practices, and *perceived* overlaps and gaps across the main energy-using sectors: industry, banks, public, residential and commercial. A Functions and Responsibilities Matrix was then developed.

Summary of Major Findings

The Functions and Responsibilities Matrix shows clearly where the institutional set-up is sufficient, where enhancements are needed, and what functions remain to be developed and assigned. The key findings are as follows:

By Functional Area

Policy Framework

- The policy framework related to EE is reasonably strong and is based on international good practice. The EE Law and subsequent regulations cover all key energy-using sectors, with relatively clear institutional mandates, roles and responsibilities, targets and implementation mechanisms, incentives and penalties, and pricing.



- With the closure of EIE, the EE Law needs to be revised and updated, with responsibilities formally assigned to EIE reassigned to specific ministry departments and institutions, including GDRE. Ministerial roles related to supporting programs are less clear, which has created some institutional overlaps/competition in EE programming.
- Additionally, some secondary legislation is still needed to complete the planned policy framework and to focus greater attention on the systematic enforcement of existing policies and regulations.

Data and Information

- In general, the institutional roles for data collection and information dissemination are in place. GDRE has primary responsibility for collecting energy consumption information for large users, and for developing and maintaining databases for such information. However, there is a need to strengthen GDRE's ability in such areas as reporting enforcement, data cleaning and analysis, and development of benchmarking and sectoral analysis functions.
- There is also a need to develop systems to collect information on implementation experiences—case studies, financing modalities, sample contracting schemes, and so on—in order to replicate successes and develop programs to further support financing and implementation.
- Information campaigns have been successfully implemented but appear to have lapsed at times.

Incentives and Implementation Support

- A number of incentive schemes and technical assistance (TA) programs have been developed and are operational, but not all program planning and implementation functions—such as market studies, program design, implementation plans, monitoring and reporting, evaluation, and program redesign—have been formalized.
- Although most incentive schemes target larger industrial consumers, funds have not always been fully utilized. There are no incentive programs specifically targeting public facilities, commercial buildings, or the residential sector, or for new mechanisms such as energy service companies (ESCOs).
- While there are a number of TA initiatives across the institutions, most appear to be ad hoc in nature, funded by donors, and prone to phasing out after a few years. There are no functional EE information centers, websites, or other means of providing comprehensive technical, financial, and implementation information to end users.

Monitoring and Evaluation

- The monitoring and evaluation (M&E) functions have yet to be fully developed and operational. Some M&E functions are planned, or have been assigned in policies, but no formal evaluation reports were identified.
- Targets do exist at the national level, but limited analysis has been done on the reasonableness of the targets, implementation costs, sources of financing, and so on. There are no sector or subsector targets to determine the relative priority or energy savings potential across them. Nor does there appear to be an adopted methodology for determining how progress towards the national targets would be measured and at what intervals it would be reported.
- At the program and project levels, there are no clear evaluation and measurement and verification (M&V) methodologies or plans to determine their impacts or efficacy. Such evaluation plans can help identify program objectives and goals, then develop indicators and methods to determine if and when the program has met them.



By Market Segment

Industrial Sector

- Large industries have clear policy mandates under the EE Law and are able to access commercial financing through typical corporate lending. However, there is a lack of systematic subsector data analysis and benchmarking which would allow the government to identify high and low performers. Enforcement of industrial EE mandates, including assessment of the quality of compliance, needs to be strengthened.
- SMEs have moderate access to financing. There is a need to develop additional financing and delivery models for EE to help SMEs that have less access to traditional commercial credit, such as simple vendor leasing and ESCO schemes, to accelerate EE investments.

Public Sector

- Public agencies have some policy mandates and TA programs, but there is no national level program to provide regulatory incentives, policy adjustments, financing and TA to fully serve this sector. Policy adjustments are needed to modify existing policies and regulations that create procedural barriers for public entities to implement EE improvements (such as public budgeting, procurement and borrowing). Enforcement of EE mandates for public entities also needs to be strengthened.
- A key gap is access to financing for both central and municipal entities. International experience suggests that a dedicated, quasi-public financing scheme may be needed for public sector EE projects until municipal credit markets are further developed.
- There is a need for improved subsector data analysis and benchmarking that would allow identification of high and low performers across a range of subsectors—such as public buildings, street lighting, municipal water pumping, and public transportation. Street lighting was specifically highlighted by several interviewees as an area where clarity on ownership and operations was needed.





Table ES-1: Advantages and Limitations of the Institutional Models

Institutional Model	Advantages	Limitations
Broad-based National Energy Agency	Greater credibility with stakeholders	EE may get low priority
	Larger resource availability	Slower bureaucratic decisions
	Greater clout in obtaining funds	Difficulty in retaining staff
Government Agency focused on sustainable energy, EE, RE	Focus consistent with EE	Smaller size provides less clout
	Common goals, functions, etc.	EE may get less emphasis due to lower capital intensity/visibility
	Easier to attract dedicated staff	
Government Agency focused on EE	EE focus creates strong culture/motivation	Agency part of a larger organization
	More flexibility in program design	May face difficulties in obtaining adequate resources
	Possible leveraging of other resources	
Independent Statutory Agency	Independence facilitates decisions/operations	Agency may not be viewed as mainstreamed
	Can obtain external advice/funding	Less direct access to public funding
	Greater flexibility in decision-making	May require new legislation
Independent Corporation focused on EE	Can access private sector talent and technical capacity	Agency may not be viewed as mainstreamed
	Flexibility in decision-making/operations	Less direct access to public funding
	Ability to access external funding	Potential competition with public agencies
Public-private Partnership focused on EE	Access to private sector inputs/funding	Potential conflicts between public and private sector interests and perspectives
	Flexibility in decision-making/operations	Less direct access to public funding
Non-governmental organization focused on EE	Greater credibility with some stakeholders	Some stakeholders may find NGOs less credible or accountable
	Flexibility in decision-making/operations	
	Access to private sector inputs/funding	Less direct access to public funding

Source: Prepared by authors based on ESMAP 2008.

Residential Sector

- The government has relatively strong programs for efficient appliances, through national standards and labeling, public awareness campaigns, and a developed retail credit market. Better public data is needed, however, to track market shares of efficient appliances and development of programs for low-income consumers.
- Renovation of homes to reduce heating and cooling use is less developed, particularly for multifamily apartment buildings. While some building material standards exist, there is a need to develop programs to work with existing apartment management cooperatives and homeowner associations (HOAs) to help retrofit their buildings by improving access to appropriate financing, introducing incentives, and providing TA.

International Review of Institutional Structures and Good Practices

The international review examined dozens of country and agency set-ups and experiences in order to identify good practices and institutional options. The earlier research by the World Bank had identified seven basic institutional models for EE; these are summarized in Table ES-1, along with the main advantages and drawbacks of each.



Key Success Factors

Global experience has identified a number of key success factors and core competencies for an EE agency as follows:

- **Independence, autonomy and flexibility** in decision making, and adequate resources, including staff and funding
- **Dedicated** to EE, **visible** to all stakeholders, and **accountable** for its actions and results
- Earmarked, long-term **funding source** to ensure stable and predictable funding levels
- Capable of **engaging, working and influencing** a wide range of stakeholders, including public/private organizations with EE responsibilities, regulators, utilities, and banks.
- Capacity to **leverage private-sector participation** in EE implementation and cooperate with EE equipment and service providers
- Credible systems for **monitoring and evaluation** its programs and activities
- Strong **management and leadership** and **high caliber staff**, with **proper performance incentives** to achieve institutional goals

In addition, five case studies, representing EE agencies with different institutional frameworks, were selected for detailed assessment. These included France's environment and energy management agency (ADEME), India's Bureau of Energy Efficiency (BEE), the German Energy Agency (dena), the United Kingdom's Energy Saving Trust, and the Korea Energy Management Corporation (KEMCO). The case studies information was used to document how each agency has addressed some of the important gaps identified in the Functions and Responsibilities Matrix.

How Does Turkey Compare with International Good Practices?

1. The EE entity should be independent, autonomous and flexible.
With all EE function under MENR (largely within GDRE), the EE department's independence and autonomy are low and subject to ministerial bureaucracy; staff may be subject to rotation or reassignment.
2. The entity should be dedicated to EE, visible to stakeholders and accountable for results.
GDRE is dedicated to both EE and RE; EE lost visibility by not having EE in its organizational name. Its evaluation functions remain underdeveloped, preventing GDRE from reporting impacts on its programs and assessing their cost-effectiveness and overall efficacy.
3. The entity should be able to engage, collaborate with, and influence a wide range of stakeholders.
While some outreach efforts exist, primarily with industry, there is a need for increased dialogue with banks and consumer groups. EE programs lack periodic feedback mechanisms that would allow revision on the basis of experiences and changing market conditions.
4. The entity should have strong program design, implementation and evaluation functions.
Although GDRE and other agencies have several ongoing programs, most do not appear to be based on systematic analyses, have program plans with clear objective statements, or be conducting ongoing monitoring using indicators and evaluations.
5. The entity should have good management/staff with incentives for good performance.
Since EIE was absorbed within MENR, GDRE's ability to showcase its successes has been limited. Ministerial management and staff in general are difficult to remove for reasons of poor performance, and limited incentives exist for outstanding staff achievement.

**Table ES-2: Assessment of EE Governance in Turkey**

Function	Responsibilities	Situation in Turkey
Planning	<ul style="list-style-type: none"> • Are policies/strategies based on publicly available market assessments and analytical reports? • Are institutions accountable for meeting targets, enforcing policies and assessing compliance? • Are methodologies in place to measure progress towards objectives and targets? 	<ul style="list-style-type: none"> • Not always • Partially • No
People	<ul style="list-style-type: none"> • Is there an agency dedicated to EE, with sufficient staff/resources? • Is there a board or supervisory committee with broad representation? • Can the agency freely hire staff, fire people based on poor performance, pay reasonable salaries, and offer long-term employment? 	<ul style="list-style-type: none"> • Yes • Mostly yes • No
Programming	<ul style="list-style-type: none"> • Do programs have clear goals, plans and targets? • Are there requirements for periodic evaluations and adjustments? • Are results reported regularly and publicly available? 	<ul style="list-style-type: none"> • No • No • Sometimes
Political support	<ul style="list-style-type: none"> • Is EE part of broader economic development strategy? • Are programs plans and results reporting at Ministers level? • Is funding for EE stable and predictable? 	<ul style="list-style-type: none"> • Yes • Yes • Mostly yes
Private sector	<ul style="list-style-type: none"> • Are private sector consultations part of policy and program formulation? • Have they been consulted in evaluations? • Is private sector expertise/capital being sufficiently leveraged? 	<ul style="list-style-type: none"> • Yes • Not enough • Not enough

Source: Authors

The institutional review also assessed EE governance—planning, people, programs, political support, and private sector engagement—in Turkey. Table ES-2 summarizes how the current institutional set-up in Turkey fares relative to these five key elements.

Key Institutional Principles for Turkey

While Turkey has done a commendable job in establishing a sound policy framework and creating a strong set of programs and institutions to support EE, additional enhancements are now needed to help elevate its national EE program to the next level of maturity and complexity. Some main principles that should inform institutional arrangements are as follows:

1. Turkey should consider **introducing a visible and independent EE entity**.
2. This EE entity would operate best with a **management board with broad representation**.
3. The **EE entity would serve as the primary implementing arm** of the government for EE.
4. The **EE entity would develop and maintain all program functions**—from market analysis to program formulation to implementation and evaluation, with public program plans and evaluation reports.
5. The **management team should be subject to periodic agency performance reviews by the board**, and have flexibility to hire and fire staff and reward good performance.
6. This new EE entity should make efforts to urgently **address currently underserved markets, such as the public and residential sectors**.



Table ES-3: Institutional Options for Turkey

Option	Description	International Examples
1	Dedicated general directorate for EE within MENR (“GDEE”)	<ul style="list-style-type: none"> Vietnam EE Dept. in Ministry of Industry & Trade
2	Independent EE agency reporting to MENR, with public sector board members	<ul style="list-style-type: none"> India BEE under Ministry of Power Russia REA under Ministry of Energy Thailand DEDE under Ministry of Energy Mexico CONUEE under Ministry of Energy
3	Independent EE agency reporting to multiple ministries (e.g., MENR, MoSIT, MoEU) with public-private board	<ul style="list-style-type: none"> France ADEME Austrian Energy Agency
4	Government-owned enterprise for EE with public board	<ul style="list-style-type: none"> Korea, Rep.: KEMCO South Africa: NEEA Finland: Motiva Norway: ENOVA Spain: IDAE
5	Independent statutory authority with public-private board	<ul style="list-style-type: none"> U.K. EST Energy Conservation Center of Japan Ireland Sustainable Energy Authority Sri Lanka Sustainable Energy Authority
6	Public-private partnership for EE, with public and private shareholders and board members	<ul style="list-style-type: none"> Germany dena Polish National Conservation Agency
7	Small administrative agency with all programming functions outsourced to private sector for implementation under performance-based contracts	<ul style="list-style-type: none"> U.S. state EE utilities South Africa Eskom standard offer program

Source: Authors

Institutional Options for Turkey

Based on the assessments conducted during this project, the following models were identified as potential options for Turkey (Table ES-3). It should be emphasized that the options presented are proposed as a potential restructuring of GDRE and not the creation of a completely new entity.

Institutional Recommendations for Turkey

In terms of specific institutional models, it is recommended that the government either establish an **independent statutory authority** or a **PPP** to serve as its future EE agency. Both options would provide sufficiently strong independence with suitable private sector input and influence. The primary role of the new EE agency would be to serve as the implementing arm of the government for EE programs.

The entity would initially be staffed with GDRE employees and possibly supplemented with program staff from MoSIT and MoEU. Staffing would evolve over time, based on program needs, skills mix, staff performance, funding, etc. In terms of programming, each existing EE program would need to be approved by the board, with a program implementation plan prepared along with a clear strategy, and would be made public once approved. Strategies and plans would be developed for each of the main sectors—industry, public, residential within the first six months of operation.



The board itself would be chaired by MENR and have broad representation, including all government agencies with EE responsibilities. Representatives from select industrial associations, banks, consumer groups, academia, and civil society should also be considered. The board will have primary responsibility for oversight of the EE agency, including appointment and renewal of the management team, strategic documents, approval of annual budgets and work plans, approval of all new program plans, review of progress and evaluation reports, and other tasks to reasonably ensure effective operation of the EE agency.

Because the board will make most of the program-level decisions, the EECB could be transformed into a higher-level EE Policy Committee, possibly chaired by the Prime Ministry, which focuses on issues such as inter-ministerial coordination, policy formulation and updates, and review of regulatory enforcement. This Committee could also make recommendations to the EE agency's board in terms of new programming, public information needs on new regulations, and so forth.

The government recently issued detailed action plans for many of the 10th Development Plan's focal areas, including EE. The government is calling for *"[GDRE] to be transformed into a stronger structure that will also steer and coordinate energy efficiency activities of other agencies and organizations as well."* While such enhancements will be needed to strengthen the GDRE's institutional capacity, additional efforts may be needed to achieve parallel enhancements to governance, independence and accountability. Thus, implementing appropriate revisions to the structure of GDRE should be given a high priority to ensure that planned capacity enhancements will have the greatest impact and can be sustained.

It is recognized, of course, that the selection of a specific model is a political decision. Nevertheless, the government is encouraged to select an option as early as possible and initiate a transition plan, as extended deliberations would likely create further uncertainty, potentially harming EE program performance. Once a decision is made, refinement of the institutional design, along with the development of more detailed transition and business plans, would then be necessary. The World Bank and donor community would stand ready to provide support in such an endeavor.





1. Introduction

Background

In line with its accession to the European Union (EU), Turkey must honor its global commitments for climate change mitigation and environmental sustainability. At the same time, it must sustain its economic growth. Energy efficiency (EE) will be critical in both respects.

Turkey imports 72 percent of its energy,¹ which in 2013 accounted for US\$56 billion, or 7 percent of its GDP. Current projections suggest that continued growth in electricity demand will deplete the power reserve margins within the next five years. Turkey's energy intensity (i.e., energy consumption per unit of GDP) is relatively low—0.11 toe/US\$1000 (2005 purchasing power parity) compared with the EU figure of 0.12 in 2011).² However, it rose by 6.5 percent from 2005 to 2011, whereas in EU countries it declined by 8.4 percent over the same period. As energy use per capita rises (1.52 toe as compared with 3.29 toe in the EU), its energy intensity is expected to continue to grow.

Recent World Bank and other assessments have identified substantial potential for EE gains across all sectors.³ In Turkey's industrial sector, for example, where some industries consume two to three times the energy of their peers in OECD countries, estimates indicate potential savings of 25 percent. The similarly inefficient building sector could save about 30 percent. Realizing EE gains of this magnitude is feasible and would substantially improve Turkey's competitiveness.

Further, total greenhouse gas (GHG) emissions in Turkey increased by more than 130 percent from 1990 to 2012, presenting a major environmental challenge.⁴ The government recognizes this and considers EE a key component of its energy security strategy as reflected in the 2011 document *Turkey's National Climate Change Adaptation Strategy and Action Plan*.⁵

In 2011 the World Bank conducted a market assessment and initial policy/institutional review of EE in Turkey (World Bank 2011a) and found that:

- The overall EE policy framework had been significantly enhanced in recent years.
- Although policies, technical capacity, and information gathering were fairly strong functions, critical gaps remained in each area.
- There were a number of systemic issues related to the institutional set-up and market development to fully mobilize commercial financing for EE.
- There was a need for a strong, dedicated institution focused on EE to ensure that the EE market realizes its potential. This would require:
 - Completing necessary secondary legislation;
 - Establishing national level programs in all sectors;
 - Matching financing, expertise, and information with demand for EE services; and
 - Developing new financing and implementation models for EE delivery – such as promotion of energy service companies (ESCOs) and energy saving performance contracts (ESPCs).

1 European Environment Agency (See <http://www.eea.europa.eu/resource-efficiency>).

2 International Energy Agency, Energy Statistics website (www.iea.org).

3 See, for example, World Bank 2011a and 2011c.

4 TurkStat Bulletin, April 7, 2014 (<http://www.tuik.gov.tr/PreHaberBultenleri.do?id=16174>).

5 <http://www.dsi.gov.tr/docs/iklim-degisikligi/turkeys-national-climate-change-adaptation-strategy-and-action-plan.pdf>.



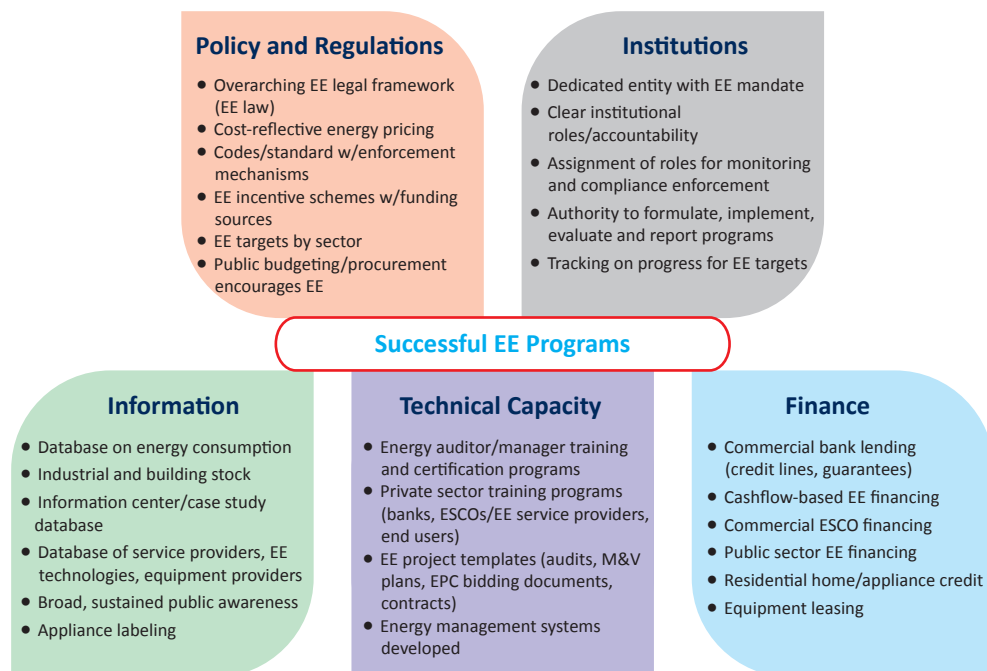
From an institutional standpoint, since 1981 the General Directorate of the Electric Power Resources Survey and Development Administration (EIE) had been mandated with EE policy making, implementation and promotion; in 2007 an Energy Efficiency Coordination Board (EECB) was established under the 2007 EE Law to coordinate various EE policies, programs and related efforts. Finally, in November 2011 a decision was made to close EIE and integrate its staff and functions into the General Directorate for Renewable Energy (GDRE) within the Ministry of Energy and Natural Resources (MENR).

In 2013 the World Bank presented its assessment of Turkey's overall EE program, based on its framework for successful EE programs (Figure 1-1).⁶

The World Bank recommended a number of key actions with respect to policy and regulations, information, technical capacity, and finance, as follows:

- Policy and regulation
 - Conduct a policy gaps analysis and complete necessary legislative updates and secondary regulations
- Information
 - Introduce a one-stop shop for clients seeking to implement EE projects
 - Develop and maintain an energy database and establish benchmarking functions
 - Issue regular sectoral energy performance reports

Figure 1-1: Framework for Successful EE Programs



Source: World Bank 2013.

⁶ "Workshop on Clean Technology Fund Impact Assessment and Energy Efficiency Policy," Ankara, May 30, 2013.



- Technical capacity
 - Redesign the ESCO certification scheme to focus more on building demand and enabling services rather than seeking to regulate the market or promote only certain business models
 - Revise and create model EE project documents—from sample ESPCs and ESCO bidding documents to measurement and verification (M&V) protocols
- Finance
 - Institutionalize commercial bank lending for EE
 - Foster new financing schemes (cash flow–based, ESCO, leasing)
 - Introduce sustainable public sector, including municipal, EE financing schemes
 - Support development and scale-up of residential EE credit schemes

With respect to institutional structure, the World Bank recommended three key areas:

1. Reform the GDRE so that it becomes a dedicated, accountable and visible EE entity with primary responsibility for EE program implementation
2. Develop clear functions for market analysis, program design, implementation, evaluation, monitoring, etc., all of which feed back into program redesign to improve implementation effectiveness
3. Enhance consultations with the private sector

Considering the importance of EE to the nation, the government decided that it was necessary to examine options for developing a new institutional framework to maximize implementation effectiveness and ensure the sustainability of EE policies and programs.

Objectives

Based on the above recommendations, an EE institutional review⁷ was undertaken in consultation with the Turkish government. The principal objective was to improve the government's ability to manage EE policies and programs and thus contribute to meeting national EE targets. Specifically, the review was designed to:

- Build on the global experience documented in *An Analytical Compendium of Institutional Frameworks for Energy Efficiency Implementation* (ESMAP 2008) and similar reports;⁸
- Develop case studies of five selected EE agencies representing different institutional structures;
- Conduct an assessment of the current Turkish EE institutional set-up;
- Survey the private sector (banks, ESCOs, equipment suppliers, etc.) and government agencies on policy issues, market challenges, barriers, and workable solutions to effectively implement EE;
- Explore sustainable financing mechanisms for EE markets currently not served or underserved by traditional financing institutions; and
- Identify institutional options for strengthening the government's capacity to implement EE policies and programs.

⁷ For the purposes of this review, EE was limited to demand-side EE only, since supply-side EE regulation and implementation is already underway with the regulatory agency, EMRA, and the utility sector. EE in transportation in the review was limited to vehicle standards, as other measures such as integrated land-use planning and modal shifts to public transportation are typically done through municipal planning and not EE agencies.

⁸ These reports include IEA 2010 and World Bank 2011b.



Methodology and Approach

The review consisted of the following tasks:

1. Review and document the current policy and institutional framework.
2. Conduct interviews with government and private sector stakeholders to obtain their views on the effectiveness of existing institutional arrangements, weaknesses and limitations, and options to remedy them.
3. Document the current functions and responsibilities of various government agencies, analyze the current set-ups, and identify key gaps by sector and functional area.
4. Review international experience with EE institutional set-ups, building upon previous studies and reports, with emphasis on countries that have been successful in delivering large-scale EE programs; then identify a range of institutional models and define their key characteristics, strengths and limitations.
5. Summarize international good practices, conduct case studies of five EE agencies representing different institutional frameworks, assess how these have addressed some of the gaps identified in the Turkish institutional set-up, and identify a portfolio of institutional options to address these gaps and deficiencies.
6. Conduct a stakeholder workshop to present the institutional gaps and deficiencies, summarize international experiences, present options and propose recommendations, and invite practitioners from the case study countries to share their experiences.
7. Define a set of recommendations and institutional options that Turkey should consider for a revised EE institutional framework.

Report Structure

Section 2 of this report summarizes the existing institutional framework for EE in Turkey. It comprises an update of existing legislative, regulatory, and policy initiatives as well as an overview of the major agencies having some responsibilities for EE.

Section 3 summarizes the results of the stakeholder interviews. It describes the process used to conduct the interviews, the development of the functions and responsibilities matrix, key findings of the interviews, and the identified gaps and deficiencies.

Section 4 presents the results of the review of international experience with institutional frameworks for EE. It summarizes prior research by international agencies and presents case studies of five EE institutional models selected in this project to represent a range of models: the French environment and energy management agency (ADEME), India's Bureau of Energy Efficiency (BEE), the German Energy Agency (dena), the U.K.'s Energy Saving Trust, and the Korea Energy Management Corporation (KEMCO).

Section 5 presents the main institutional challenges with the current institutional set-up in Turkey and identifies potential institutional options and key attributes for a successful EE program. It also provides recommendations and a summary of next steps.

The Appendixes provide the interview guides and summaries of the five case studies.



2. Existing Institutional Framework

Introduction

This section summarizes the existing institutional framework for EE in Turkey, including:

- Key legislative, regulatory and policy initiatives related to EE
- Identification of key responsible agencies and their roles
 - Ministry of Energy and Natural Resources (MENR) and its General Directorate for Renewable Energy (GDRE)
 - Ministry of Environment and Urbanization (MoEU)
 - Ministry of Science, Industry and Trade (MoSIT)
 - Other government agencies

Key Legislative, Regulatory and Policy Initiatives

The most important piece of legislation is the Energy Efficiency Law (Law No. 5627) enacted in May 2007.⁹ This Law, implemented by MENR, has been complemented by dozens of regulations and communiqués.

A second important piece of legislation is the Law related to the Preparation and Implementation of Technical Legislation of Products (Law No. 4703), enacted in June 2001.¹⁰ This Law, managed by MoSIT, relates to EE since it governs household appliance labeling. In 2010, the Regulation on the Eco Design of Energy Related Products¹¹ was adopted in accordance with EU Directive 2009/125/EC and 11 other directives released later. In 2011, the Regulation on Indication by Labeling and Standard Product Information of the consumption of energy and other resources by energy related products¹² was adopted according to EU Directive 2010/30/EU and four later directives related to products.

In 2008 the Regulation on Energy Performance in Buildings, under MoEU, was adopted. Among other things, it requires each new building to have an energy certificate specifying its energy performance level.

In 2012 the High Planning Council approved the Energy Efficiency Strategy Paper,¹³ which calls for energy intensity reduction of at least 10 percent for each subsector within 10 years, based on 2011 consumption levels.

The Energy Efficiency Development Program is included in Section 1.14 of the 10th Development Plan (2014–18),¹⁴ which was approved in 2013. This Program includes performance indicators such as (a) a reduction in primary energy intensity from 0.265 toe/US\$1000 in 2011 to 0.246 in 2018 and (b) a 10 percent reduction in the energy usage of government buildings by 2018 compared to 2012.¹⁵ In November 2014 the government issued an Action Plan for the Program for Improving Energy Efficiency under its 10th Development Plan that calls for, among other things, improving the administrative and institutional capacity for EE.

Figure 2-1 shows the major legislation related to EE.

⁹ Law No 5627, dated April 18, 2007, published in Official Gazette 26510 of 02.05.2007.

¹⁰ Law No 4703, dated June 29, 2001, published in Official Gazette 24459 of 11.07.2001.

¹¹ Published in Official Gazette 27722 of 07.10.2010.

¹² Decision No: 2011/2257, dated 02.09.2011, published in Official Gazette 28130 of 02.12.2011.

¹³ Energy Efficiency Strategy Paper, 2012-2023.

¹⁴ 10th Development Plan, published in Official Gazette 28699 of 06.07.2013.

¹⁵ The government's energy intensity figures differ from the IEA figures given in Section 1 because IEA converts GDP figures, which are denominated in international dollars, using purchasing power parity rates based on the 2005 International Comparison Program (ICP) round. This method makes it possible to compare the output of economies and the welfare of their inhabitants in real terms.

**Figure 2-1: Major EE-Related Legislation**

Source: Authors

Major Agencies with EE Responsibilities

The Ministry of Energy and Natural Resources (MENR)

MENR was first established in 1963 by Presidential order and subsequently codified by Law 3154, enacted in 1985. MENR's legal mandate is

*to help define targets and policies related to energy and natural resources in a way that serves and guarantees the defense of the country, security, welfare, and strengthening of our national economy; and to ensure that energy and natural resources are researched, developed, generated and consumed in a way that is compatible with said targets and policies.*¹⁶

The General Directorate of Energy Affairs (GDEA) is the main policy body within MENR and is responsible for coordinating and supporting energy policy to ensure energy security, including natural gas, renewable energy (RE), and EE.

General Directorate of Renewable Energy (GDRE)

From its creation in 1981 until its closure in 2011, the General Directorate of the Electrical Power Resources Survey and Development Administration (EIE), an agency under MENR's administration, was responsible for researching and promoting EE and RE. EIE's main mission was to promote rational energy use and increase the demand for EE through concerted, integrated collaboration with related institutions. EIE carried out EE studies in end-user sectors, conducted energy audits in energy-intensive industries, and organized and conducted training, public awareness campaigns, and studies on policy and legislation.

¹⁶ MENR website (www.enerji.gov.tr).

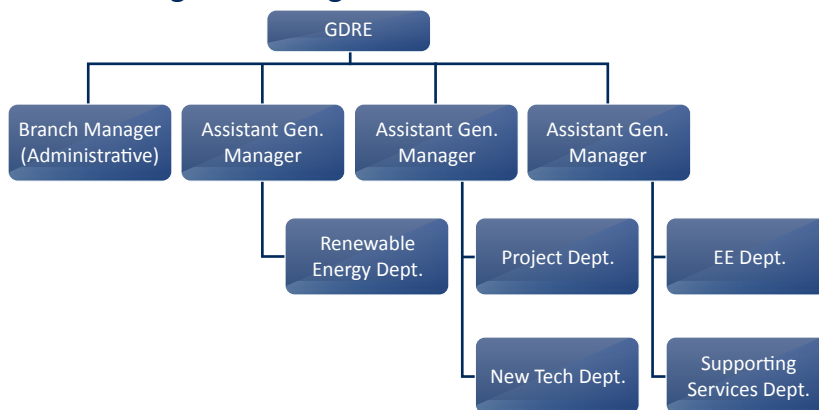


In November 2011 the government issued a decree¹⁷ closing EIE and creating a new general directorate within MENR: the General Directorate for Renewable Energy (GDRE). Since the EE Law refers to EIE rather than GDRE, the latter's legal functions in terms of energy efficiency are limited; however, the Minister of Energy and Natural Resources has assigned EE functions to GDRE through a Ministerial Decision. The EIE's former EE functions are now contained within the EE Department, one of five GDRE departments (Figure 2-2). GDRE maintains overall responsibility for the EE Law, monitoring of compliance with various legal end-user obligations, collection and analysis of energy consumption data, and implementing incentive and information and other supporting programs.

MoSIT – Climate Change and Energy Efficiency Branch

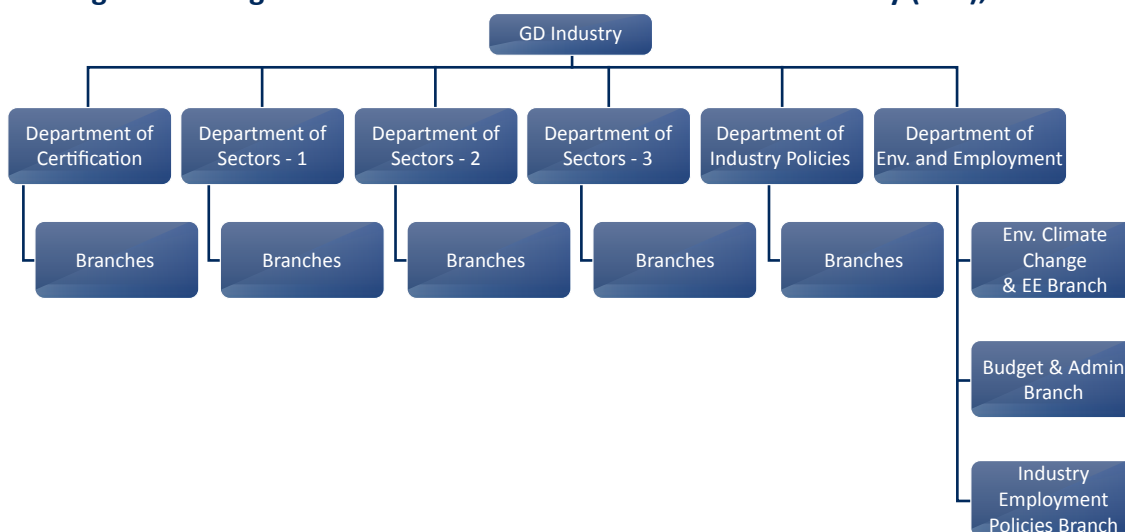
The EE Law also assigns responsibilities related to the industrial sector and manufacturing to the Ministry of Industry and Commerce, now the Ministry of Science, Industry and Technology (MoSIT). The organization chart of MoSIT is provided in Figure 2-3.

Figure 2-2: Organization Chart - GDRE



Source: Prepared by authors based on information from GDRE (see www.eie.gov.tr/organizasyon.aspx).

Figure 2-3: Organization Chart - General Directorate of Industry (GDI), MoSIT



Source: Prepared by authors based on information from MoSIT (see <http://sgm.sanayi.gov.tr/OrganizationChart.aspx?lng=tr>).

¹⁷ Decision no: KHK/663, published in Official Gazette 28103 of 02.11.2011.



MoSIT prepares sectoral strategy papers which refer to EE but typically do not include policy elements within them. Under this Ministry, the Environment, Climate Change, and Energy Efficiency Branch under the General Directorate of Industry (GDI), is responsible for the impacts of industrial policy on the environment, EE and climate change. GDI develops and implements secondary legislation on industrial energy use and equipment manufacturing (including eco-design and eco-labeling of appliances), develops and enforces technical standards for common industrial equipment, and coordinates testing protocols and verification of product compliance with the Turkish Standards Institute (TSE). Under Article 10.9 of the EE Law, MoSIT is assigned to enforce industry standards for consumer products.

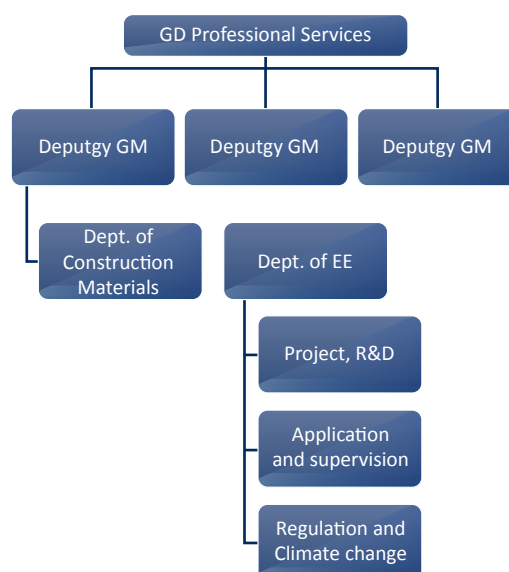
TSE currently operates a testing facility for electrical appliances such as refrigerators, lights, electric ovens, and televisions, and has plans to upgrade its laboratory testing capabilities to include additional appliances such as air conditioners and white goods. No facilities exist in the country for testing industrial equipment, such as electric motors.

MoEU – Energy Efficiency Department

The EE Law and Regulation on Energy Performance in Buildings also assigns certain responsibilities to the Ministry of Public Works and Settlement, now the Ministry of Environment and Urbanization (MoEU). The organization chart of the Directorate of Professional Services is provided in Figure 2-4.

The Energy Efficiency Department (EED), under the General Directorate of Professional Services, has been delegated responsibility for implementing the building EE policies. This Department's functions cover residential and commercial buildings in accordance with the EE Law and Regulation on Energy Performance in Buildings, focusing on the development and enforcement of building codes and certificates for new and renovated buildings, standards for construction materials, training for design and construction firms, certification of companies to certify building performance levels, and conducts some outreach efforts on policy compliance.

Figure 2-4: Organization Chart - GD Professional Services - MoEU



Source: Prepared by authors based on information from MoEU (see www.csb.gov.tr/db/meslekihizmetler/ustmenu/ustmenu233.jpg).



Energy Efficiency Coordination Board

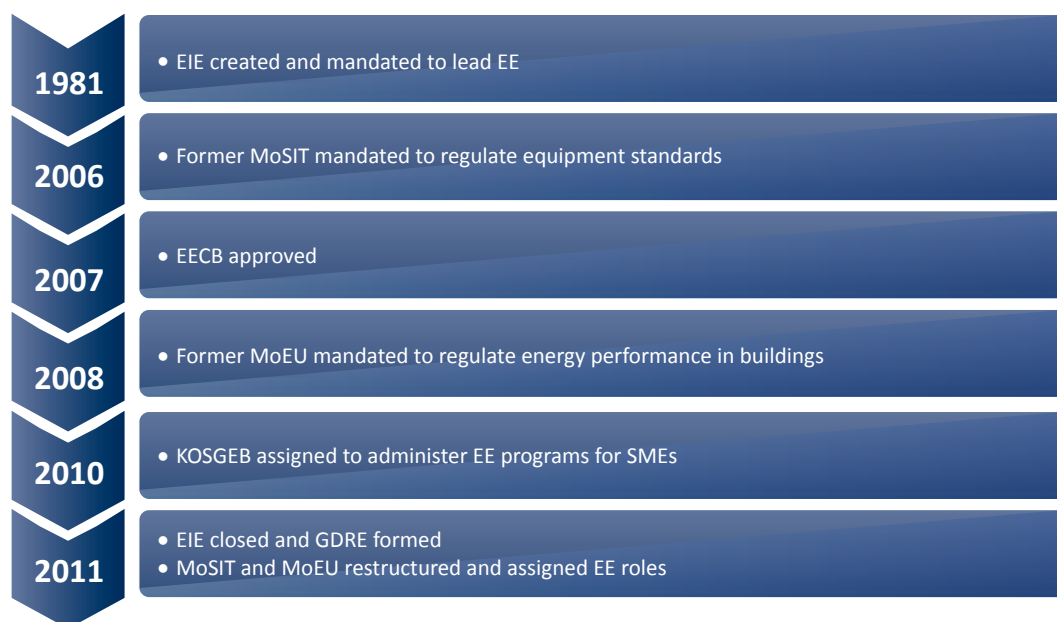
The EE Law also mandated the establishment of a central body—the Energy Efficiency Coordination Board (EECB)—comprising high-level representatives from all ministries related to EE, along with some industrial associations.¹⁸ The EECB's main functions are to (a) prepare national EE strategies, plans and programs, assess their effectiveness, and revise/implement as necessary, (b) steer EE studies and approve authorization of certificates for EE service, (c) approve EE projects eligible for government incentive schemes and monitor results, (d) establish ad hoc commissions as needed, (e) set meeting agendas and participants for advisory committee meetings, and (f) establish and publish fees for certificates each year.

As specified in the EE Law, the EECB meets four times in a year, although additional sessions can be called. The Deputy Undersecretary of MENR chairs the Board, and GDRE serves as the Board's Secretary. The meeting minutes are documented. The quorum for each meeting is a two-thirds majority and resolutions are passed by the majority of those present.¹⁹

Summary Timeline of Major Institutional Changes

A summary of the timeline for some of the important institutional changes related to EE is presented in Figure 2-5.

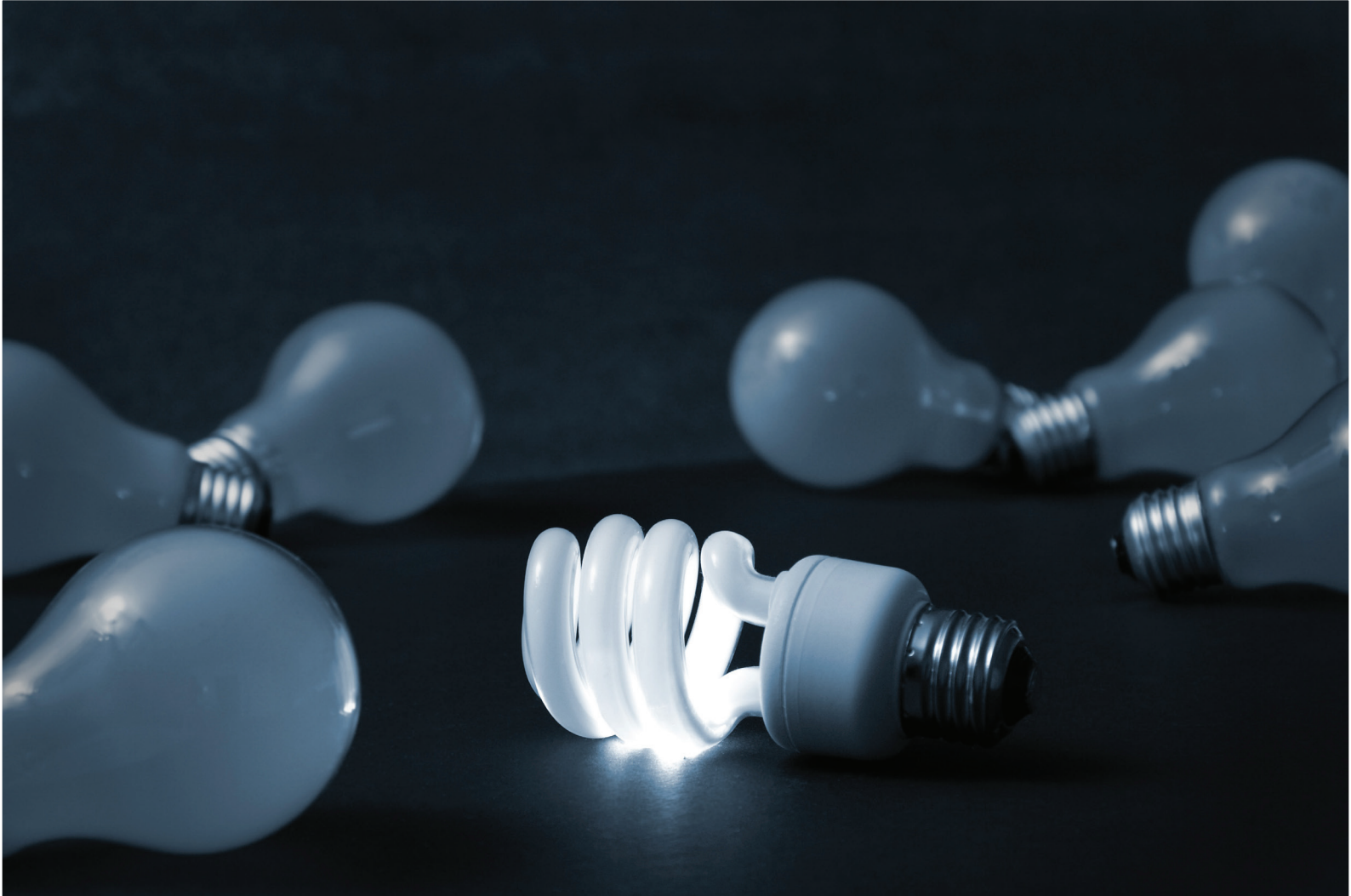
Figure 2-5: Timeline of Major Institutional Changes



Source: Authors

¹⁸ The primary participants in EECB are representatives of the Ministry of Interior, Ministry of Finance, Ministry of Development, Ministry of National Education, MoEU, Ministry of Transport, MoSIT, Ministry of Forests and Water, the Treasury, the Energy Market Regulatory Authority (EMRA), the Turkish Standards Institute, the Turkish Scientific and Technological Research Institution (Tubitak), the Turkish Union of Chambers and Commodity Markets (TOBB), the Turkish Union of Chambers of Engineers and Architects (TMOBB), and Turkish Union of Municipalities.

¹⁹ See <http://www.eie.gov.tr/verimlilik/EVKK.aspx> for a list of EECB meetings showing dates, attendees, minutes, decisions, and so forth.





3. Stakeholder Interviews and Functional Review

Framework for Documenting Functions and Responsibilities

The report team developed a framework to document the existing institutional functions and responsibilities of various government and private sector organizations in EE-related activities. Based on international experience, this framework defined the major areas of functions and responsibilities in the following categories:

- **Policy**
 - Formulation
 - Implementation
 - Enforcement
- **Data and Information**
 - Data collection
 - Reports and publications
 - Dissemination
- **Incentives and Implementation Support**
 - Grants and financial incentives
 - Training and capacity building
 - Guidebooks, tools, templates, etc.
 - Stakeholder consultations
- **Monitoring and Evaluation**
 - Targets
 - Measurement and verification
 - Evaluation

To characterize the EE functions and responsibilities for each of the above function areas, the following market segments were defined:

- Industry
 - Banks
 - ESCOs
 - Equipment suppliers
- Public sector
- Residential sector
- Commercial buildings

Stakeholder Interviews

Process

The stakeholder interviews were designed to obtain information on the various EE-related institutional functions and responsibilities in order to identify any existing gaps and deficiencies. Questionnaires covered specific institutional goals and functions; programs; target indicators and evaluation methodologies; mechanisms for coordination and information sharing; perceptions on strengths and areas for improvement; possible gaps and/or overlaps; and areas/sectors for new programming. Two separate Interview Guides were prepared, one for government agencies and one for private organizations (see Appendix A). The team interviewed 32 people:

**Table 3-1: Interviewee Responses to Select Questions**

Question	Response	
	Yes	No
Is the current government institutional and organizational structure sufficient to support EE market development in Turkey?	50%	50%
Does your agency or organization have specific goals with performance indicators? (public sector only)	19%	81%
Does your agency or organization monitor policies, regulations and programs to assess results/impacts? (public sector only)	19%	81%
Does your organization have incentives, rewards or penalties for achieving your goals? (public sector only)	19%	81%
Would you suggest that improvements should be made for the government's institutional and organizational structure?	93%	7%

Source: Prepared by authors based on interview results.

20 representatives from government agencies and 12 from private sector organizations (six associations, three ESCOs, and three banks).

Interview Findings

While the main purpose of the interviews was to document the functions of each agency and identify potential gaps, they also provided some general indications and perceptions about the state of the institutional set-up. Responses to select questions are summarized in Table 3-1. In general, the private sector representatives interviewed were more critical of the institutional set-up than were the government officials.

Functions and Responsibilities Matrix

The interviews, along with the review of existing policies and regulations, also helped to complete a Functions and Responsibilities Matrix. The purpose of this matrix was to identify and document current responsibilities as formally mandated, gaps in relation to international best practices, and perceived overlaps and gaps as indicated by various interviewees. The matrix is presented in four tables as follows:

- Table 3-2: Policy
- Table 3-3: Information
- Table 3-4: Support
- Table 3-5: Monitoring and Evaluation

The color coding in the Matrix indicates the following:

- Items in black represent the facts based on existing legislation that addresses current functional requirements and obligations;
- Items in *red* indicate confirmed gaps in institutional functions; and
- Items in *green* are opinions from the interviewees, areas where there appears to be some confusion, or areas of perceived overlap.²⁰

²⁰ Red and green entries are also designated in italics in the event the report is printed in black-and-white.



Table 3-2: Functions and Responsibilities Matrix - Policy

Sectors	Formulation	Implementation	Enforcement
Industrial Sector	<ul style="list-style-type: none"> EE Law passed in 2007 and numerous secondary legislation enacted 2008-2013, many relate to industry MoSIT prepares sectoral strategy papers, which refer to EE but do not include policy elements EE Strategy Paper adopted in Feb 2013; supporting regulations to be adopted within one year GDRE has completed its secondary legislation; <i>it is not clear if all other regulations have been prepared and adopted by other line ministries</i> MoSIT prepares and adopts industry regulations for energy use and equipment produced, including aspects such as eco-design 	<ul style="list-style-type: none"> GDRE monitors industry obligations - e.g., annual energy consumption reporting, appointment of energy managers, energy auditing TSE operates electrical appliance testing facility; additional testing capabilities are being added in 2014 MoSIT is responsible for ensuring industry compliance with national standards <i>There is no facility for testing large industrial equipment - e.g., motors</i> 	<ul style="list-style-type: none"> GDRE can assess administrative sanctions (EE Law, Article 3,4,10) for failure to assign energy managers, reporting and misreporting MoSIT can enforce industry standards of consumer products (EE Law, Article 10.9) <i>In practice, active enforcement does not appear to be in place for noncompliance</i>
Banks	<ul style="list-style-type: none"> Treasury plays guarantor role in mobilizing IFI resources through credit lines, etc. MENR, MoSIT, MoEU provide policy/technical and some administration support depending on sectoral coverage of loan <i>Banks appear dependent on IFI credit lines; reluctant to finance EE with own funds (due in part to short-term tenors)</i> <i>Lending policies for banks to public and municipal sectors is underdeveloped</i> 	<ul style="list-style-type: none"> Banks and IFIs report progress to Treasury and line ministries as necessary <i>Supervision of credit line reflows to ensure continued use for EE is unclear</i> 	n/a
Energy Service Companies	<ul style="list-style-type: none"> MENR Notification (2012/4) describes EE services <i>Secondary legislation related to ESCO operations, accounting and tax implications, still required</i> 	<ul style="list-style-type: none"> GDRE issues authorization certificate to provide EE services (last updated 2011) 	<ul style="list-style-type: none"> GDRE reviews and reauthorizes certificates every 3 years GDRE may suspend authorization certificate of ESCO pending evaluation <i>ESCOs can do EE projects without certification (so value of certification may be questionable)</i> <i>Some ESCOs are voluntarily not applying for recertification</i>
Equipment Suppliers	<ul style="list-style-type: none"> MoSIT decides which standards are needed and develops them in coordination with TSE, adopts eco-design and eco-labeling regulation for energy using appliances, mainly in line with EU acquis TSE develops testing protocols and tests equipment MoEU adopts regulations on EE standards for construction materials 	<ul style="list-style-type: none"> MoSIT inspects conformity of products from notified body according to eco-design and eco-labeling directives MoEU (Surveillance & Auditing Dept.) inspects conformity of construction materials (in coordination with MoSIT) TSE operates electrical appliance testing facility 	<ul style="list-style-type: none"> Penalty in case of unconformity of product according to Law 4703 which bans local sale of equipment below minimum standards
Public Sector	<ul style="list-style-type: none"> EE Law Article 4(3) designates EE Coordination Board for the preparation of EE strategy papers/ plans/programs, assessment of their effectiveness, coordination of revisions, developing/ implementing new measures in public and other sectors In EE legislation, government-owned buildings should take compulsory measures on EE Compulsory measures exist to set up energy management and appoint energy managers for large public buildings and enterprises Public building administrators are required to conduct energy audits and take necessary measures <i>No agency responsible for revising public procurement regulations, budgeting to support EE/ESCOs</i> 	<ul style="list-style-type: none"> GDRE instructs public agencies to implement EE measures; agencies can allocate (or request from MoF/MoD) budgetary support for investment GDRE collects and verifies energy consumption data for large public facilities <i>MENR and EDCs handle municipal street lighting with plans to shift to municipalities in 2015</i> <i>Transition plan for SL transfer is not in place or unclear</i> 	<ul style="list-style-type: none"> GDRE can assess administrative sanctions (EE Law, Article 10) for failure to assign energy managers, reporting and misreporting <i>In practice, there are no enforcement mechanisms for non-compliance from public sector</i>
Residential Sector	<ul style="list-style-type: none"> MoEU issued regulation on Energy Performance Certificates for buildings and construction materials MoSIT adopted eco-design and eco-labeling regulation for energy using appliances MoEU set HOA policies to allow for 51% vote for investment decisions for EE (e.g., insulation, fuel switching, heating systems) and ability to borrow and sign contracts Heating insulation standard (TS825) was updated in 2008 to comply with EU <i>Regulation requiring TOKI to incorporate EE measures in public housing is not clear</i> 	<ul style="list-style-type: none"> MoEU provides Energy Performance Certificates in Buildings Building code compliance assessed by local MoEU office in municipality MoSIT inspects conformity of products from notified body according to eco-design directive MoEU (Surveillance & Auditing Dept.) inspects conformity of construction materials (in coordination with MoSIT) 	<ul style="list-style-type: none"> New buildings must meet code to get permit and certificate; certificate compulsory in order to sell Existing buildings must get certificates after 2017 in order to sale For appliance standards, penalty in case of unconformity of product according to Law 4703 Heat meters and temperature controls are compulsory for residential buildings with central heating systems
Commercial Buildings	<ul style="list-style-type: none"> MoEU issued regulation on Energy Performance in Buildings, which include Energy Performance Certificates MoSIT adopted eco-design and eco-labeling regulation for energy using appliances MoEU adopted regulations on construction materials Large buildings have to report on energy mgmt, including energy use, appoint energy managers, audits, projects, training/awareness, etc. 	<ul style="list-style-type: none"> MoEU provides Energy Performance Certificates in Buildings Building code compliance assessed by local MoEU office in municipality MoSIT inspects conformity of products from notified body according to eco-design directive MoEU (Surveillance & Auditing Dept.) inspects conformity of construction materials (in coordination with MoSIT) 	<ul style="list-style-type: none"> New buildings must meet code to get permit and certificate; certificate compulsory in order to sell Existing buildings must get certificates after 2017 for sale For appliance standards, penalty in case of unconformity of product according to Law 4703



Table 3-3: Functions and Responsibilities Matrix - Data and Information

Sectors	Data Collection	Reports and Publications	Dissemination
Industrial Sector	<ul style="list-style-type: none"> GDRE collects energy consumption data through EE Portal on all large industries (currently has data on 1,264 out of 3,000) GDEA, Industrial associations, TurkStat also collect some fuel, energy use data at the factory level <i>It is not clear who can access this data</i> <i>Some studies have been initiated but GDRE does not have systems in place to clean, analyze, report on data</i> <i>MRV is not well defined or coordinated</i> 	<ul style="list-style-type: none"> GDRE did sector specific analyses (e.g., iron, cement) <i>but these do not appear to have been made public</i> Some aggregated industrial data provided by associations Some industrial subsector benchmarking exists (cement, iron/steel), some are in process (textile, ceramic) <i>but there is no regular reporting; it is not clear which additional subsectors will be added in the coming years</i> <i>No new market studies are being carried out (other than by some donors)</i> <i>No reports/information with case studies, good practices are available for large industries or SMEs</i> 	<ul style="list-style-type: none"> MENR, MoSIT initiated "Energy Efficient Industry" awareness campaign for organized industrial zones GDRE organizes EE Week every year GDRE organizes annual contests and shares information on successful industrial EE projects, enterprises and products EE Law also created Advisory Committee so GDRE can consult with private sector/NGOs annually; National EE Strategy sought to enhance Committee effectiveness, <i>but it is unclear if these changes have taken place</i>
Banks	<ul style="list-style-type: none"> Treasury collects credit line implementation data from banks and partner IFIs <i>Analysis, sharing and use of data is not clear</i> 	<ul style="list-style-type: none"> <i>No public reports that present bank lending data on EE</i> 	<ul style="list-style-type: none"> Some information campaigns by GDRE for private sector includes banks Some marketing and promotional efforts by IFIs/donors and their banking partners to promote EE financing
Energy Service Companies	<ul style="list-style-type: none"> GDRE collects some information on ESCO activities <i>but does not appear to collect details about contracts, M&V methods, energy savings, etc.</i> 	<ul style="list-style-type: none"> <i>No reports prepared/issues that present data on ESCO activity in Turkey</i> <i>No agency has prepared any ESCO case studies yet</i> 	<ul style="list-style-type: none"> Most information related to ESCOs is done on a project-by-project basis under various donor programs GDRE has made some efforts to promote certified ESCOs (names on website, promotional events)
Equipment Suppliers	<ul style="list-style-type: none"> Some manufacturer associations collect data on the relative market shares of various appliances GDRE is responsible for tracking sales or market shares of high efficiency products 	<ul style="list-style-type: none"> <i>No reports prepared on tracking data for high efficiency equipment sales, market shares, etc.</i> 	<ul style="list-style-type: none"> MoSIT is responsible for educating consumers about labels and standards Law requires suppliers include efficiency information in user guides
Public Sector	<ul style="list-style-type: none"> GDRE collects energy consumption data through EE Portal on large government institutions (currently has data on 642; <i>total number not known</i>) GDRE has over 130 audit reports of public buildings All MENR buildings have to provide energy consumption data MoT collects municipal-level transport data according to the regulation on EE in transportation 	<ul style="list-style-type: none"> <i>No reports exist on EE data for government or energy use, results of audits</i> A few pilots in EE in public buildings have been carried out <i>but limited results reporting</i> <i>No public buildings/street lighting benchmarking functions are active or planned</i> <i>No periodic market studies are being carried out</i> <i>No reports with EE case studies, good practices are available for public agencies</i> 	<ul style="list-style-type: none"> GDRE organizes EE Week every year GDRE organizes annual contests for students with MoED/TUBITAK to increase EE awareness <i>No specific information programs identified targeting public sector facility administrators</i> <i>No competitions, awards, etc. being done regularly with public agencies to increase awareness about EE</i>
Residential Sector	<ul style="list-style-type: none"> MoEU collects Energy Performance Certificate data 	<ul style="list-style-type: none"> <i>No reports identified that present data on residential energy use or benchmarking</i> <i>No periodic market studies are being carried out in the residential sector</i> 	<ul style="list-style-type: none"> MENR runs general public EE campaign; <i>unclear if it is still active</i> MoSIT (with MENR) has education program for appliance labels/standards MoEU is responsible for education on building certificates <i>No competitions, awards, etc. being done to increase awareness at household level</i>
Commercial Buildings	<ul style="list-style-type: none"> MoEU collects Energy Performance Certificate data GDRE collects energy consumption data through EE Portal on all large buildings; <i>no data on % compliance</i> 	<ul style="list-style-type: none"> <i>While some spotty data exists, there are no reports prepared that present systematic data on commercial building energy use</i> <i>No periodic market studies are being carried out in the buildings sector</i> 	<ul style="list-style-type: none"> GDRE organizes EE Week every year <i>No campaigns targeted to building owners, hotels, shopping centers, offices, etc.</i>



Table 3-4: Functions and Responsibilities Matrix - Implementation Support

Sectors	Grants and Incentives	Training and Capacity Bldg	TA (guides, tools, templates, etc.)	Stakeholders Consultations
Industrial Sector	<ul style="list-style-type: none"> GDRE has programs with some financial incentives (e.g., Efficiency Increasing Projects-VAP, Voluntary Agreements, IFI/donor projects) TTGV has Env. Support Programs which offer low interest loan for environmentally beneficial projects including EE Kosgeb provides grants for audits, consultancy training cost for SMEs GDRE & TTGV incentive programs do not appear to be coordinated Incentive schemes generally have low utilization rates, perhaps due to complicated procedures, long lead times, and low awareness 	<ul style="list-style-type: none"> GDRE has a training facility and organizes training programs for the certification of energy managers and auditors (and for some neighboring countries) GDRE also authorizes firms/ institutions for energy manager and energy audit training GDRE approves energy manager/audit training, provides exams and issues certificates Kosgeb provides grants to cover the training costs of SME's energy managers 	<ul style="list-style-type: none"> GDRE prepares 1-page technical info notes, case studies on EE GDRE provides voluntary energy audit application templates, which collect detailed factory level and system level data (16 pages) GDRE plans to share World Bank EE screening tool for SMEs No functional EE information center, with technical, financial, and implementation information for industrial clients No sample ESCO contracts have been tested or are in place 	<ul style="list-style-type: none"> MoSIT consults with private industry when preparing sector strategy papers which refer to EE promotion TSE's Mirror Committee collects view of private sector on related standards including EE GDRE conducted industry surveys on EE awareness but has not done one lately Consultations do not appear to request industry feedback on government programs, incentives, tools, etc.
Banks	<ul style="list-style-type: none"> IFI credit lines offer long-term, low-cost financing to banking partners which then onlend at mostly market rates Some credit lines allow for free EE assessments, or additional risk coverage to allow for reduced collateral requirements 	<ul style="list-style-type: none"> Bank training is not assigned to any agency but most IFI projects include elements for bank training No agency is responsible for bank training related to EE or retaining past IFI bank training materials, etc. 	<ul style="list-style-type: none"> Some IFIs have developed EE calculators, appraisal templates, etc. for their banking partners No agency appears to be responsible for development of tools to support banks for lend for EE 	<ul style="list-style-type: none"> Consultations for industry do include banks
Energy Service Companies	<ul style="list-style-type: none"> There are no specific incentives for ESCO projects other than ones for industry, etc. 	<ul style="list-style-type: none"> GDRE responsible for certification of ESCOs and key technical staff GDRE has some training for ESCOs Some ESCO training done on project-by-project basis under various donor programs 	<ul style="list-style-type: none"> No guides exist on how to work with ESCOs or sample ESCO contracts 	<ul style="list-style-type: none"> Consultations for industry include some ESCOs
Equipment Suppliers	<ul style="list-style-type: none"> No incentives exist for equipment suppliers to produce or sell high efficiency products 	<ul style="list-style-type: none"> No training programs exist for equipment suppliers No visible efforts made to promote energy efficient equipment leasing 	n/a	<ul style="list-style-type: none"> Consultations for industry include some equipment suppliers
Public Sector	<ul style="list-style-type: none"> MoEU and MoEd have pilots in health and education sectors Ilbank can provide some financing related to municipal EE Division of municipal credit market between commercial banks and Ilbank is not clear Governors provides EE action plan that covers activities of government institutions of cities every six months to DG Provincial Administration GDRE conducts some audits; launched audit program for public facilities in 2013 with 166 audits due by end 2014; coordination with MoEU is not clear Dedicated financing mechanism for public sector may be required 	<ul style="list-style-type: none"> Government institution energy managers can participate in GDRE training UMT provided training on EE Law related to municipal and building obligations in 9 regions Some government institutions organize EE training for staff (e.g., teachers, imams with GDRE support) 	<ul style="list-style-type: none"> No sample ESCO bidding documents have been developed or tested for use by public agencies No specific tools or information for public agencies on EE are available 	<ul style="list-style-type: none"> Relevant government institutions are members of national-level EECB Branch of Governments institutions are member of city EECB under Deputy Governor
Residential Sector	<ul style="list-style-type: none"> No specific energy audit or investment incentives are available for households at this time 	<ul style="list-style-type: none"> MoEU organizes workshops and trainings for design/construction firms MoEU authorizes companies to verify building energy performance certificate levels 	<ul style="list-style-type: none"> MoEU developed BEP-TR software for architects/engineers to assess building performance 	<ul style="list-style-type: none"> Consultations for industry include some construction companies but do not appear to include consumer groups, HOAs, etc.
Commercial Buildings	<ul style="list-style-type: none"> TTGV has Env. Support Programs which offer low interest loan for environmentally beneficial projects including EE, but not focused on buildings No dedicated incentive schemes for EE in commercial buildings 	<ul style="list-style-type: none"> GDRE has a training facility and organizes training programs for the certification of energy managers and auditors (and for some neighboring countries) GDRE also authorizes firms/ institutions for energy manager and energy audit training, provides exams and issues certificates MoEU organizes workshops and trainings for design/construction firms MoEU authorizes companies to verify building energy performance certificate levels 	<ul style="list-style-type: none"> MoEU developed BEP-TR software for architects/engineers to assess building performance GDRE plans to share World Bank EE screening tool which also covers buildings 	<ul style="list-style-type: none"> Consultations for industry include some construction companies



Table 3-5: Functions and Responsibilities Matrix - Monitoring and Evaluation

Sectors	Targets	Measurement & verification	Evaluation
Industrial Sector	<ul style="list-style-type: none"> • EE Strategy Paper calls for at least 10% energy intensity reduction defined for each subsector within 10 years (by 2023) • <i>Although addressed in the EE Strategy, there are no sector targets yet for large industry/SMEs or any specific industrial subsectors</i> 	<ul style="list-style-type: none"> • <i>There are no developed or adopted M&V protocols or guidelines to determine energy savings for ESCO projects, or for government-supported or private EE projects</i> • <i>There is no agreed method or systematic data collection to assess progress towards national targets</i> 	<ul style="list-style-type: none"> • MENR is responsible for coordinating and reporting progress with national target to Council of Ministers • GDRE carries out some analysis on the impacts of grant programs and report to EECB • <i>No government program appears to have impact or process evaluations planned or completed</i> • <i>There does not appear to be any institution assigned to report or assess progress towards industrial sector EE targets</i>
Banks	<ul style="list-style-type: none"> • IFI projects typically include specific project-level targets • <i>There are no overall bank financing targets for EE</i> 	<ul style="list-style-type: none"> • <i>There is no standardized method for how banks report on energy savings</i> 	<ul style="list-style-type: none"> • IFI credit lines are typically evaluated by IFIs at project closure <i>but are not always public</i>
Energy Service Companies	<ul style="list-style-type: none"> • <i>The EE Strategy includes a target to improve capacity for 50 ESCOs for industry</i> • <i>There are no overall EE targets for ESCOs</i> 	<ul style="list-style-type: none"> • ESCOs are not obligated to use any specific M&V protocols; they develop their own as agreed with clients 	<ul style="list-style-type: none"> • <i>No evaluation of ESCO promotional activities, certification scheme, etc. were identified</i>
Equipment Suppliers	<ul style="list-style-type: none"> • <i>No targets appear to exist related to market shares for high efficiency equipment</i> 	<ul style="list-style-type: none"> • MoSIT is responsible for spot checking of products on the market to determine if appliance standards are being met • <i>No data or reports identified on compliance rates, failure of spot checking</i> 	<ul style="list-style-type: none"> • <i>No evaluation of educational programs were identified</i>
Public Sector	<ul style="list-style-type: none"> • 20% energy use reduction target for public sector by 2023 (2011 baseline) • <i>No EE target breakdown by subsector or region</i> 	<ul style="list-style-type: none"> • <i>No agency has developed M&V procedures for public sector EE or ESCO projects</i> 	n/a
Residential Sector	<ul style="list-style-type: none"> • <i>While the EE Strategy Paper includes some actions/targets for buildings, no specific EE targets for residential buildings exist</i> • <i>No data on what percent of appliances are labeled and market shares</i> 	n/a	<ul style="list-style-type: none"> • <i>No ex-post inspection of residential apartment buildings to determine actual compliance with building code or verify building certificate level</i> • <i>Only one impact assessment completed on public awareness campaigns</i> • <i>No process evaluations to determine if public campaigns could be improved to increase impacts/effectiveness</i>
Commercial Buildings	<ul style="list-style-type: none"> • <i>While the EE Strategy Paper includes some actions/targets for buildings, no specific EE targets for commercial buildings exist</i> 	n/a	<ul style="list-style-type: none"> • <i>No ex-post inspection of commercial buildings to determine actual compliance with building code or verify building certificate level</i>

Source: Authors



Summary of Findings

While the Functions and Responsibilities Matrix offers a wealth of detail on institutional functions and gaps, it also offers some more general indications about where the institutional set-up is sufficient, where enhancements are needed, and what functions remain to be developed and assigned. This section will present some of these main findings in two ways: (a) by functional category and (b) by market segment.

By Functional Category

Policy Framework

- The policy framework related to EE is reasonably strong and is based on international good practice. The EE Law and subsequent regulations cover all key energy-using sectors, with relatively clear institutional mandates, roles and responsibilities, targets and implementation mechanisms, incentives and penalties, and pricing.
- With the closure of EIE, the EE Law needs to be revised and updated, with responsibilities formally assigned to EIE reassigned to specific ministry departments and institutions, including GDRE. Although the current assigning of EE functions to GDRE was done through an MENR Ministerial Decision, this may not provide a solid legal basis because changes could be made over time as political appointments change.
- Ministerial responsibilities are clearly delineated in term of policy formulation and enforcement, but the development and implementation of supporting programs are not. This has created some institutional overlaps/competition in EE programming. A separate EE agency could better allow ministries to delegate certain supporting functions to it, thus effectively serving as the main implementing arm of the government.
- Additionally, some secondary legislation is still needed to complete the planned policy framework and to focus greater attention on the systematic enforcement of existing policies and regulations. Some of these revisions are updates to existing regulations (e.g., administration of municipal street lighting), some are adjustments to regulations in other areas to accommodate EE (e.g., public budgeting and procurement rules to encourage EE), and some relate to new mechanisms for further development (e.g., ESCO contracting and accounting). Not all of these revisions have been assigned to specific institutions.²¹

Data and Information

- In general, the institutional roles for data collection and information dissemination are in place. GDRE has primary responsibility to collect energy consumption information for large users and develop and maintain databases for such information.
- There is a need to strengthen GDRE's ability to enforce reporting, clean and analyze data, develop benchmarking and sectoral analysis functions, carry out periodic sector market studies, and disseminate periodic reports for public use.
- There is also a need to develop systems to collect information on implementation experiences—case studies, financing modalities, sample contracting schemes, and so on—in order to replicate successes and develop programs to further support financing and implementation.

²¹ There is also a National EE Action Plan under development by MENR, supported by EBRD, which is expected to be available in 2015.



- Information campaigns have been successfully implemented but appear to have lapsed occasionally. Most campaigns appear to have focused on broad public awareness; informational programs targeting specific sectors are primarily done through workshops. No evaluations of these campaigns appear to have been undertaken.

Incentives and Implementation Support

- A number of incentive schemes and technical assistance (TA) programs have been developed and are operational. Not all program planning and implementation functions—market studies, program design, implementation plans, monitoring and reporting, evaluation, redesign of programs, and so on—have been formalized. Thus while many programs have had good participation rates and provided valuable impacts, the lack of systematic planning, monitoring and evaluation limits the ability to determine the impacts, effectiveness or cost-efficiency of the programs.
- Most incentive schemes target larger, industrial consumers. While funding has been consistently allocated, funds have not always been fully utilized. It appears that the process could be more streamlined and incentives more targeted. There are no incentive programs specifically targeting public facilities, commercial buildings or the residential sector, or for new mechanisms such as ESCOs.
- While there are a number of TA initiatives across the institutions, most appear to be ad hoc in nature, many are funded by donors, and most programs tend to phase out after a few years. There are no functional EE information centers, websites, or other means of providing comprehensive technical, financial, and implementation information to end users.
- Certification schemes are in place and many appear to be working well. The ESCO certification system needs to be revised, however, given the lack of ESCO activity and need to encourage more innovation in business models.

Monitoring and Evaluation

- The monitoring and evaluation (M&E) functions have yet to be fully developed and made operational. Some M&E functions are planned, or have been assigned in policies, but no formal evaluation reports were identified. Formalizing these functions and operationalizing them remains a critical need, and would allow the focus to shift from outputs (workshops and energy audits, for example) to outcomes (such as investment volume and energy savings).
- Targets do exist at the national level, but limited analysis has been done on the reasonableness of the targets, implementation costs, sources of financing, and so forth. There are no sector or subsector targets to determine the relative priority or energy savings potential across them. Nor does there appear to be an adopted methodology for determining how progress towards the national targets would be measured and at what intervals it would be reported.
- At the program level, there are no clear evaluation methodologies or plans to determine their impacts or efficacy (these are referred to as *impact and process evaluations*). Such evaluation plans can help identify program objectives and goals, then develop indicators and methods to determine if and when the program has met them. This can help agencies determine when a program is no longer needed or when a program needs to be redesigned to improve its impacts and effectiveness.
- At the investment or project level, measurement and verification (M&V) protocols are not yet developed or adopted. While some draft M&V guidelines exist, they do not appear to be widely understood or applied.



By Market Segment

Industrial Sector

- Large industries have clear policy mandates under the EE Law (in areas such as reporting energy use, appointing energy managers, and completing energy audits) and are able to access commercial financing through typical corporate lending. However, there is a lack of systematic subsector data analysis and benchmarking which would allow the government to identify high and low performers. Enforcement of industrial EE mandates, including assessment of the quality of compliance, needs to be strengthened.
- SMEs have moderate access to financing. While state-owned banks have been encouraged to and provide credit to SMEs, there is a need to develop additional financing and delivery models for EE, such as simple vendor leasing and ESCO schemes, to help SMEs that have less access to traditional commercial credit and thereby accelerate EE investments.

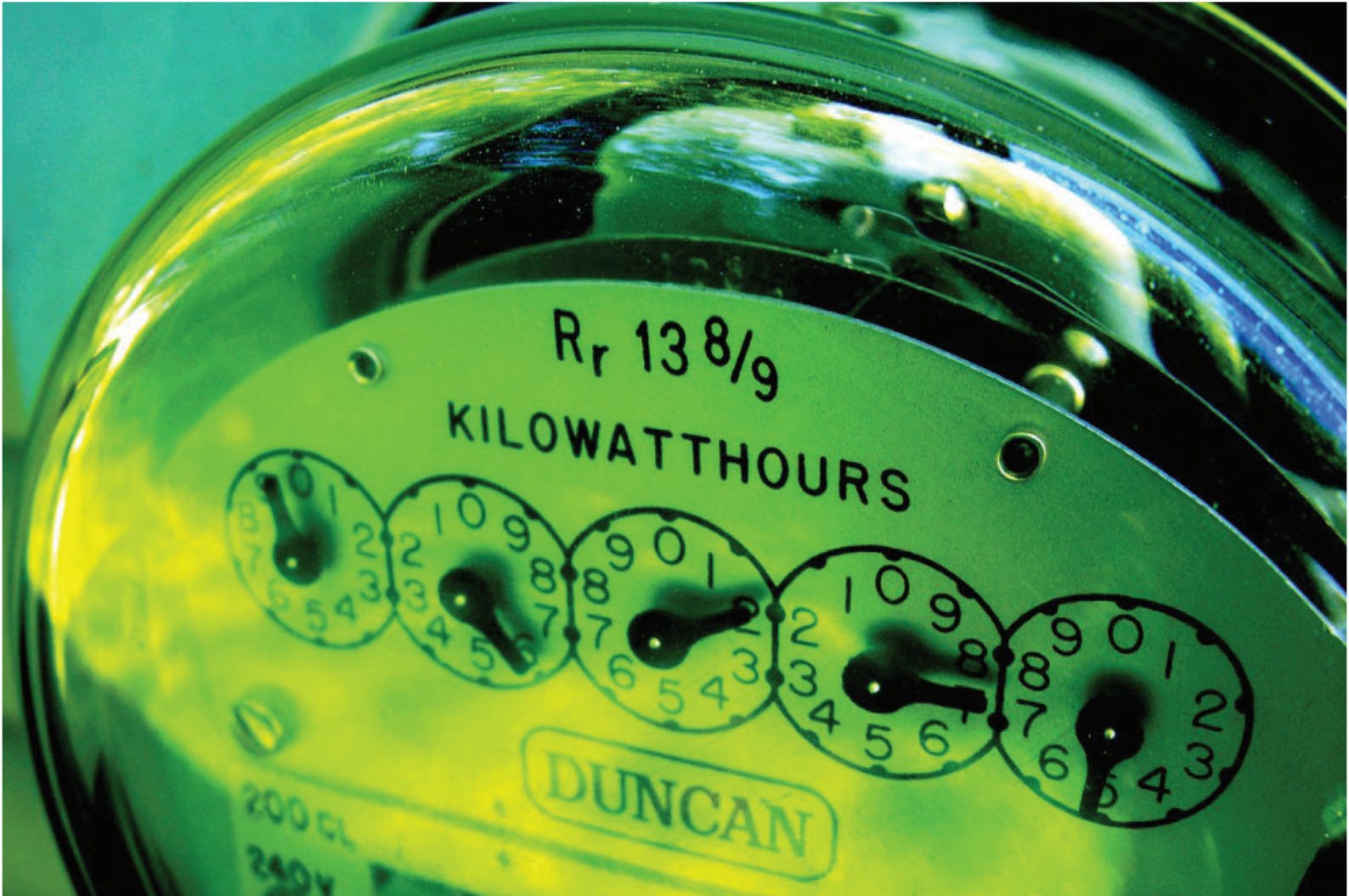
Public Sector

- Public agencies have some policy mandates and TA programs, but there is no national level program to provide regulatory incentives, policy adjustments, financing and TA to fully serve this sector. Policy adjustments are needed to modify existing policies and regulations that create procedural barriers for public entities to implement EE improvements (such as public budgeting, procurement and borrowing). Enforcement of EE mandates for public entities also needs to be strengthened.
- A key gap is access to financing for both central and municipal entities. International experience suggests that a dedicated, quasi-public financing scheme (such as an EE Fund) may be needed for public sector EE projects until municipal credit markets are further developed.
- There is a need for improved subsector data analysis and benchmarking that would allow identification of high and low performers across a range of subsectors—such as public buildings, street lighting, municipal water pumping, and public transportation.
- One particular area, raised by several interviewees, concerns municipal street lighting. Since the government is developing a transition plan to transfer ownership and operation of street lighting systems beyond 2015, there is an urgent need for greater clarity on the transition plan and for the development of appropriate options for street lighting upgrades and financing.

Residential Sector

- The government has relatively strong programs for efficient appliances, through national standards and labeling, public awareness campaigns and a developed retail credit market. Better public data is needed, however, to track market shares of efficient appliances and development of programs for low-income consumers.
- Renovation of homes to reduce heating and cooling use is less developed, particularly for multifamily apartment buildings. While some building material standards exist, there is a need to develop programs to work with existing apartment management cooperatives and homeowner associations (HOAs)²² to help retrofit their buildings by improving access to appropriate financing, introducing incentives, and providing TA.

²² For multifamily apartment buildings, working with HOAs, apartment cooperative management, and so on is necessary for two reasons: (a) to clarify decision-making authority so that a simple majority (i.e., 51 percent) of homeowners are able to make an investment decision regarding EE renovations for the entire building, rather than requiring agreement by everyone, or 100 percent, before a project can go forward; and (b) to allow HOAs to legally borrow funds, sign contracts, etc. for EE improvements on behalf of individual homeowners. Without such provisions, it is extremely difficult for building-wide EE renovations (such as insulation of walls, floors, roofs, and common spaces) to be upgraded.





4. International Review of EE Institutional Frameworks

The report team conducted an international review of EE institutional frameworks in order to:

- Identify and review established institutional models in developed and developing countries for effectively promoting investments in demand-side EE;
- Emphasize frameworks that enable end-users, utilities and energy service providers, the private sector, the financial sector, and market intermediaries (such as ESCOs) to play an effective role in scaling up EE investments;
- Conduct case studies of EE agencies in five countries representing a range of institutional models; and
- Assess key characteristics and good practices of effective institutional frameworks to identify a portfolio of institutional options for EE in Turkey.

Review of Prior Research

Institutional frameworks represent the organizational structures and related instruments that facilitate the development of enabling mechanisms (such as laws or decrees), the formulation of government strategies and policies, the design and development of programs, the implementation and financing of the programs, and the monitoring and evaluation of results. These frameworks also include mobilization of private sector activities and cooperation with international development agencies. Most countries have recognized that the design and deployment of successful EE implementation programs requires that the institutional framework be capable of helping to achieve the desired national EE goals and targets in consultation with the major stakeholders, consistent with local market and economic conditions. Because the institutional framework provides the basis for interventions designed to overcome market, economic, and technical barriers, it needs to reflect the unique economic, market, technical, governmental, and political characteristics and capacities of the country.

A number of prior studies that have reviewed institutional frameworks for EE implementation across different countries. For this report the team reviewed three of the most important:

1. The review of EE institutional frameworks conducted by the World Bank's ESMAP program in 2008, entitled *An Analytical Compendium of Institutional Frameworks for Energy Efficiency Implementation* (ESMAP 2008). The report reviewed 27 country EE institutional set-ups, developed a compendium of institutional structures, and provided guidelines for implementing institutions. The report identifies, analyzes, categorizes, and describes the main success factors of EE institutional models and practices in the main end-use sectors: industry, buildings, and residential.
2. The International Energy Agency's 2010 *Energy Efficiency Governance* report, which includes an assessment of international enabling frameworks, institutional arrangements, functions, and coordination mechanisms (IEA 2010). The report identified a range of organizational types, from departments within energy ministries to state-owned companies and non-governmental organizations (NGOs), and highlighted several principles for configuring EE implementing agencies.
3. A 2011 World Bank report on institutional governance, *Enhancing Institutional Governance for Demand-Side Energy Efficiency Implementation in Developing Countries*, which focused on legislative frameworks, funding mechanisms, institutional arrangements, and coordination mechanisms to support the implementation of EE strategies (World Bank 2011b).



The following discussion presents some of the findings from these studies.

The Seven Basic Institutional Models

The ESMAP institutional review identified and reviewed EE agencies spanning 27 developed and developing countries and varying in age from 2 to 30 years. Under the review, seven distinct institutional models were identified (Table 4-1).

These models represent a range of different structures, from a national energy agency (with broad-based responsibilities that include EE) to independent EE agencies to public-private partnerships (PPPs). Whereas the older EE agencies, established during the 1990s, were mainly broad-based national energy agencies, in more recent years specialized agencies focused on EE and related clean energy investments were found to be more common. Several implementing institutions established in the last decade have been independent statutory authorities or government-owned corporations. The ESMAP study also found a few PPPs and NGOs serving in this institutional role.

As with all institutional models, each has a distinct set of advantages and limitations (Table 4-2). For example, while public agencies covering all energy issues may have greater influence and resources, competing demands and priorities may affect EE issues. On the other hand, independent agencies may have greater autonomy in carrying out their day-to-day operations, but their budget allocations and political support may be subject to greater variability if they are not mainstreamed within the political set-up. This combination of advantages and disadvantages for each model drives home the importance of carefully designing the institution to maximize inherent advantages while managing limitations.

Table 4-1: Seven Institutional Models for EE

Type	Description	International Example
Government agency	Agency with broad energy sector responsibilities, including EE	<ul style="list-style-type: none">• U.S. Dept. of Energy• Danish Energy Authority
Government agency	Agency focusing primarily on clean energy (EE and RE)	<ul style="list-style-type: none">• Australian Greenhouse Office• Thailand: DEDE
Government agency	Agency focusing exclusively on EE	<ul style="list-style-type: none">• India: BEE• Brazil: PROCEL
Independent statutory agency	Independent authority created by statute to promote EE or clean energy	<ul style="list-style-type: none">• U.K.: EST• Sustainable Energy Ireland
Independent corporation	Independent government-owned corporation focused on EE	<ul style="list-style-type: none">• Korea, Rep.: KEMCO• South Africa: NEEA
Public-private partnership	Independent corporation with public private sector shareholders	<ul style="list-style-type: none">• Germany: dena• Polish National Conservation Agency
NGO	Not-for-profit or non-governmental organization dedicated to EE	<ul style="list-style-type: none">• Austrian Energy Agency• Croatia: Energy Institute

Source: ESMAP 2008.

**Table 4-2: Advantages and Limitations of the Institutional Models**

Institutional Model	Advantages	Limitations
Broad-based National Energy Agency	Greater credibility with stakeholders	EE may get low priority
	Larger resource availability	Slower bureaucratic decisions
	Greater clout in obtaining funds	Difficulty in retaining staff
Government Agency focused on sustainable energy, EE, RE	Focus consistent with EE	Smaller size provides less clout
	Common goals, functions, etc.	EE may get less emphasis due to lower capital intensity/visibility
	Easier to attract dedicated staff	
Government Agency focused on EE	EE focus creates strong culture/motivation	Agency part of a larger organization
	More flexibility in program design	May face difficulties in obtaining adequate resources
	Possible leveraging of other resources	
Independent Statutory Agency	Independence facilitates decisions/operations	Agency may not be viewed as mainstreamed
	Can obtain external advice/funding	Less direct access to public funding
	Greater flexibility in decision-making	May require new legislation
Independent Corporation focused on EE	Can access private sector talent and technical capacity	Agency may not be viewed as mainstreamed
	Flexibility in decision-making/operations	Less direct access to public funding
	Ability to access external funding	Potential competition with public agencies
Public-private Partnership focused on EE	Access to private sector inputs/funding	Potential conflicts between public and private sector interests and perspectives
	Flexibility in decision-making/operations	Less direct access to public funding
Non-governmental organization focused on EE	Greater credibility with some stakeholders	Some stakeholders may find NGOs less credible or accountable
	Flexibility in decision-making/operations	
	Access to private sector inputs/funding	Less direct access to public funding

Source: Adapted by authors from ESMAP 2008.





The three reports also provided guidance regarding the typical functions of EE agencies, the characteristics of good governance, and key success factors and core competencies. Table 4-3 illustrates the typical functions of EE institutions, which include general administration; program development, planning and budgeting; program administration and management; program delivery and implementation; and program assessment and evaluation.

Table 4-3: Typical Functions of EE Institutions

Function	Responsibilities
General administration and coordination	<ul style="list-style-type: none"> • Manage budgets and contracts • Maintain databases and information systems • Reporting
Program development, planning and budgeting	<ul style="list-style-type: none"> • Prepare market analyses, identify market barriers/gaps, formulate program strategies and goals • Facilitate public planning processes • Prepare program proposals, plans, budgets
Program administration and management	<ul style="list-style-type: none"> • Prepare detailed program designs • Recruit/Procure implementing partners and contractors • Develop quality criteria and monitoring plans • Administer budgets and contracts
Program delivery and implementation	<ul style="list-style-type: none"> • Market programs and provide information • Launch and implement key program activities • Develop measurement and verification (M&V) plans
Program assessment and evaluation	<ul style="list-style-type: none"> • Assess program impacts, cost-effectiveness • Evaluate effectiveness of program and administration • Develop recommendations to continue program, redesign and relaunch, or cancel

Source: Adapted by authors from ESMAP 2008.

The IEA and World Bank governance reports examined the key characteristics of good institutional governance: planning, people, programming, political support, and the private sector (Table 4-4).

Table 4-4: Principles of Good EE Governance

Function	Responsibilities
Planning	<ul style="list-style-type: none"> • Are policies/strategies based on publicly available market assessments and analytical reports? • Are institutions accountable for meeting targets, enforcing policies and assessing compliance? • Are methodologies in place to measure progress towards objectives and targets?
People	<ul style="list-style-type: none"> • Is there an agency dedicated to EE, with sufficient staff/resources? • Is there a board or supervisory committee with broad representation? • Can the agency hire and fire people, pay reasonable salaries, offer long-term employment?
Programming	<ul style="list-style-type: none"> • Do programs have clear goals, plans and targets? • Are there requirements for periodic evaluations and adjustments? • Are results reported regularly and publicly available?
Political support	<ul style="list-style-type: none"> • Is EE part of broader economic development strategy? • Are programs plans and results reporting at Ministers level? • Is funding for EE stable and predictable?
Private sector	<ul style="list-style-type: none"> • Is private sector consultations part of policy and program formulation? • Have they been consulted in evaluations? • Is private sector expertise/capital being sufficiently leveraged?

Source: Adapted by authors from ESMAP 2011.



Based largely on the ESMAP report, key success factors and core competencies for an EE agency were determined to be the following:

- **Independence, autonomy, and flexibility** in decision making and adequate resources, including staff and funding
- **Dedicated** to EE, **visible** to all stakeholders, and **accountable** for its actions and results
- Earmarked, long-term **funding source** to ensure stable and predictable funding levels²³
- Capable of **engaging, working and influencing** a wide range of stakeholders, including public and private agencies/organizations with EE responsibilities, regulators, utilities, and banks
- Capacity to **leverage private-sector participation** in EE implementation and cooperate with EE equipment and service providers
- Credible systems for **monitoring and evaluation** its programs and activities
- Strong **management and leadership** and **high caliber staff**, with **proper performance incentives** to achieve institutional goals

International Good Practices

The international review also identified good practices in terms of EE policies and programs for EE agencies in key energy-using sectors—industrial, public and residential facilities—based on four functional areas: (a) policy and regulations, (b) financing and incentives, (c) information and awareness, and (d) training and capacity building. The review also looked at the subsectors or functional areas identified in Section 3 as needing to be further strengthened: ESCO development, program formulation and implementation, and M&E. The main elements of these good practices are summarized below.

Industrial Sector

For the industrial sector, some of the good practices related to the four functional areas defined above are illustrated in Table 4-5.

Table 4-5: International Good Practices - Industrial Sector

Area	Activities
Policies and Regulations	Mandatory audits and EE plans
	Certification of energy auditors and energy managers
	Equipment standards and labeling
Financing	Fiscal incentives (tax credits, acc. depreciation, etc.)
	Grants and subsidies
	Facilitating ESCO projects and equipment leasing
	EE revolving funds and credit lines
Information and Awareness	Industrial norms, best practices, and benchmarking
	EE technology databases
	Voluntary agreements
	Guidebooks, handbooks, case studies and tools
Training and Capacity Building	Training of energy auditors and energy managers
	Industrial networking and information centers
	Energy management systems training

Source: Authors

23 While some countries rely on annual government budget allocations for EE agency and program funding, other countries have created automatic funding mechanisms from various revenue sources—such as annual government budget allocations, energy or environmental taxes, state or municipal bonds, revenues from privatizations, and IFI/donor funds—to ensure that EE funding does not vary with different government administrations.



Although policies have been significantly mainstreamed across countries, full implementation and enforcement has been more piecemeal. Only a handful of governments have had the political resolve to actually shut down underperforming factories, levy major fines, or imprison owners for not complying with regulatory mandates. Access to quality information about subsector benchmarks, best practices, EE technologies, and so on has been a more common approach to engaging industry.

With respect to financing industrial sector EE projects, some of the main mechanisms used to date include:

- Establishing credit lines with commercial banks;
- Credit or risk guarantee programs for small and medium enterprises (SMEs);
- Vendor credit and leasing programs; and
- Facilitating and promoting ESCOs, energy service providers (ESPs) and energy savings performance contracts (ESPCs).

Strong monitoring of EE market barriers and successes, sharing of emerging good practices, and proactively addressing market failures can be critical to ensure a strong industrial EE program.

Public Sector

With respect to the public sector, including central and municipal facilities, the corresponding good practices related to the four functional areas are presented in Table 4-6.

Table 4-6: International Good Practices - Public Sector

Area	Activities
Policies and Regulations	Requiring EE targets and action plans
	Modifying public procurement and budgeting rules
	Public procurement of efficient products
	Equipment standards and labeling
Financing	Grants, incentives and budget financing
	EE revolving funds
	Utility financing
	Public ESCO
Information and Awareness	Benchmarking and performance awards
	EE technology databases
	Workshops on ESPC options
	Guidebooks, handbooks, case studies and tools
Training and Capacity Building	Training of energy auditors and energy managers
	Capacity building of facility engineers and managers
	Training of ESCOs, banks and other financial institutions

Source: Authors



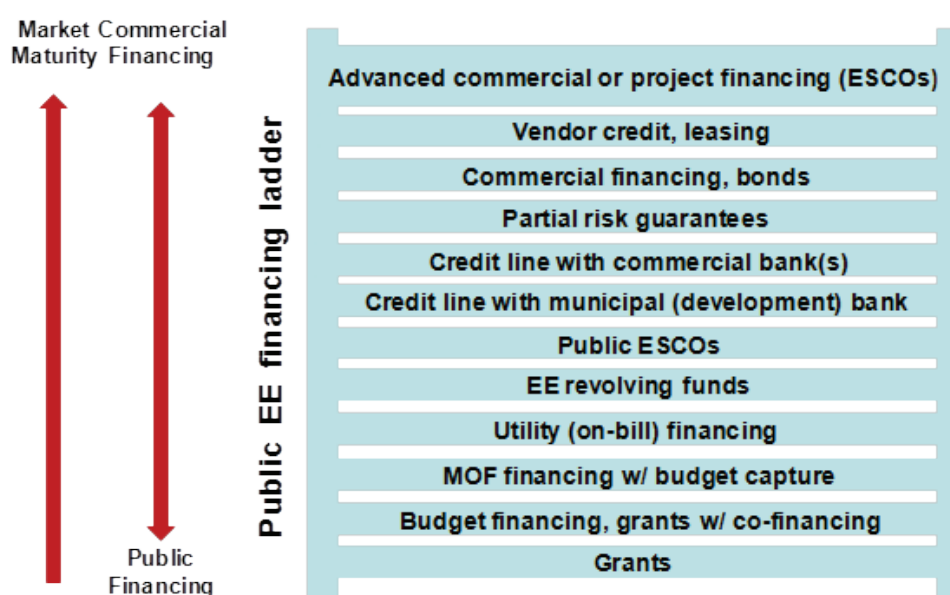
Unlike the private sector, which responds to price signals and incentives, motivating the public sector is more complex. Typically a greater focus on policy is needed, but with supporting programs to make it easier and less risky for public officials to carry out EE improvements. An important element of successful programs is the adjustment of public procurement regulations and procedures to focus on (a) life-cycle costs, rather than the lowest upfront cost; and (b) budgeting, so public agencies are not subject to reductions in their budget provisions if they are able to lower their energy bills.

With respect to financing options, international experience demonstrates that, despite large EE potentials and attractive payback periods, EE financing is hindered by a number of market failures, such as (a) a limited number of creditworthy public agencies and municipalities; (b) low or limited borrowing capacity; (c) small project sizes, leading to high transaction costs; (d) limited budget and technical capacity to prepare high-quality EE project proposals; and (e) high perceived risks, leading to behavioral inertia.

The experience of the World Bank and other international financial institutions (IFIs) indicates that a number of financing options exist that may allow public facilities to address some of these barriers. In Turkey, this “financing ladder”—which starts with public grants and ends with advanced commercial financing—can help guide policymakers to select one or more options that can then be designed to provide accessible financing products. As Figure 4-1 shows, while commercial financing may be the long-term goal, some public financing mechanisms may be necessary in the near-to-medium term to help public entities and municipalities transition to more commercial schemes.

Of course, this ladder is only meant as an illustrative guide to assist with selection. Not all mechanisms are mutually exclusive and governments need not move up every step of the ladder. The selection of appropriate mechanisms—and their subsequent design—need to be based on a number of factors, including (a) current legislative and regulatory conditions, (b) the maturity of financial and public credit markets, (c) the current state of the local EE service markets, and (d) the technical and financial capabilities of the public entities undertaking the EE projects.

Figure 4-1: Public Sector Financing Ladder



Source: World Bank 2014a.

**Table 4-7: International Good Practices - Residential Sector**

Area	Activities
Policies and Regulations	Appliance standards and labeling
	Building codes and certificates
	Utility EE obligations
Financing	Grants and incentives
	EE revolving funds
	Credit lines with low interest loans
	Utility on-bill financing
Information and Awareness	Public awareness campaigns
	EE information centers
	Free or subsidized energy audits
	Guidebooks, handbooks and tools
Training and Capacity Building	Training of residential energy auditors
	Benchmarking of energy consumption in housing

Source: Authors

Residential Sector

The residential sector also faces a number of barriers hindering financing of EE investments (World Bank 2014a). The key barriers in many countries are (a) small project size and relatively high transaction costs, (b) subsidized energy tariffs, (c) perception of high risk on the part of commercial banks, (d) issues with decision-making processes and creditworthiness in multi-family buildings, (e) relatively high commercial bank interest rates, and (f) high discount rates (or hurdle rates) on the part of residential consumers. Residential sector good practices are illustrated in Table 4-7.

Appliance standards and labeling generally have the greatest impacts in this sector, since they can influence mass purchasing decisions. Public awareness can help to educate consumers about EE options so they are able to make informed decisions. However, since the residential market is diverse and heterogeneous, finding effective delivery mechanisms for EE programs, including incentives and financing, is a challenge. As a result, it is becoming more common to enlist energy utilities in the delivery of EE programs given their extensive reach and existing relationships with consumers.

Because consumers tend to require very quick payback periods before they are willing to make an investment, incentive schemes can be a critically important mechanism. Often this means creating a dedicated funding mechanism, such as an energy or environmental tax, which automatically goes to fund such incentive schemes on a sustainable basis. However, these incentives need to be administered efficiently, transparently and equitably.

International experience points to four main financing options to support EE improvements in residential buildings: (a) EE revolving funds, (b) credit lines with commercial bank financing, (c) partial credit or risk guarantees, and (d) utility EE obligations. Table 4-8 illustrates these options. As with the other sectors, the selection, design features, and products offered under each of the four options needs to be tailored to the specific country conditions.

**Table 4-8: Residential EE Financing Options**

Option	Countries	Pros	Cons
Commercial Bank Lending	Austria, Belgium, Bulgaria, Czech Rep., Germany, Lithuania, Netherlands, Poland, Romania, Spain, U.K.	<ul style="list-style-type: none"> • Sustainable • Builds off existing credit systems • Allows for competition of financing 	<ul style="list-style-type: none"> • May only serve wealthy, creditworthy customers • May have high interest rates • Banks may lack incentive to market aggressively
Partial Credit Guarantees	Hungary, Lithuania, Czech Republic, Slovak Republic	<ul style="list-style-type: none"> • Encourages commercial banks to finance EE projects • Helps overcome risk perception of banks • Can lead to sustainable commercial financing 	<ul style="list-style-type: none"> • Requires mature banking sector interested in EE financing • May need substantial capacity building of banks • May serve only creditworthy customers
EE Revolving Funds	Bulgaria, Greece, Romania, Slovenia	<ul style="list-style-type: none"> • Can be sustainable • Mandated to promote EE • Can develop specialized products • Centralized experience and lessons 	<ul style="list-style-type: none"> • May distort market • Could create monopoly • May not operate efficiently • Can be captured by political interests
Utility EE Obligations	Belgium, Denmark, France, Ireland, Italy, Netherlands, U.K.	<ul style="list-style-type: none"> • Can be done sustainably • Builds off of utility relationships and services • Allows for simple collections (on-bill repayment) 	<ul style="list-style-type: none"> • Utilities lack incentives to reduce energy sales • Regulations may limit new utility services, billing • Can create monopoly

Source: World Bank 2013.

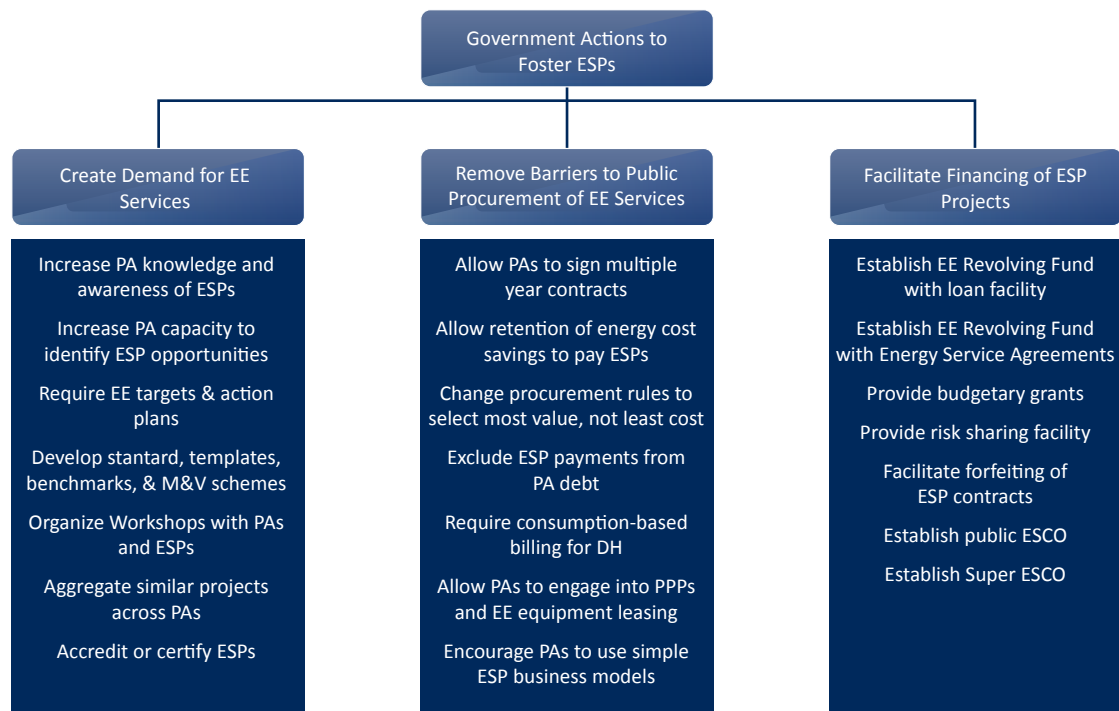
Fostering the Development of Energy Services Markets

Energy service companies (ESCOs) and energy service providers (ESPs) can be effective models to mobilize private sector financing, risk sharing and expertise for EE in all sectors. While governments can take actions to facilitate this, international experience shows such actions require a long-term commitment and are very complex. Focusing on simpler business models first, and focusing on ESCOs as service providers only (rather than financing), have been shown to be critical elements of an effective strategy.

Governments can encourage the establishment and growth of ESCO industries by undertaking a set of legislative, regulatory, and policy initiatives targeted at (a) creating a large and stable demand for ESCO projects in the public sector; (b) removing barriers to public procurement of EE services and establishing clear regulations, rules, and procedures for public agencies to work with ESCOs; and (c) facilitating adequate and affordable financing for ESCO projects (Figure 4-2). As these markets are catalyzed and the ESCO industry further developed, such models can be extended to private industry and commercial buildings. By then, these companies will have well-developed business models, proven track records, refined M&V processes, and stronger financial positions to be better able to access commercial financing.

Program Formulation and Implementation

Due to prevailing market barriers, low awareness and technical capacity, behavioral biases, etc. governments also need to develop supporting programs in addition to policy measures to help end users overcome these barriers and implement EE measures. Such programs can take on a wide range of functions including providing information, special access to financing, incentives and subsidies, tools and guides, and training.

**Figure 4-2: Fostering the Development of Energy Services Markets**

Source: World Bank 2014b.

Note: PA = public agency; PPP = public-private partnership.

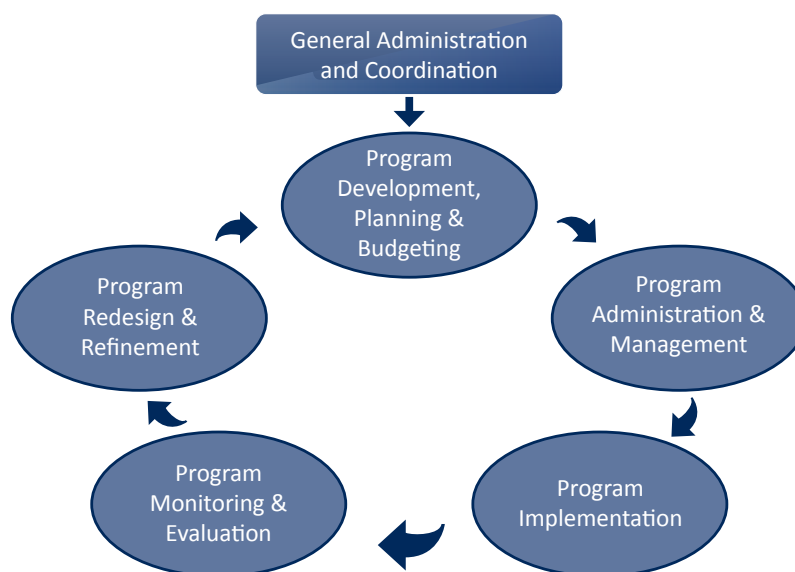
Ideally, such programming should be done not in an ad hoc manner but systematically based on market studies, with program plans that have clear objectives, measureable indicators, and defined exit strategies. These plans should be subject to broad consultations with stakeholders including potential program participants, service providers, and financiers. Additionally, international experience provides the following lessons:

- Policies need to be translated into effective programs.
- Key steps in program design and implementation include:
 - Collection of relevant market data to determine EE potential and prevailing policy and market deficiencies;
 - Analysis and synthesis of data to determine program goals and expected impacts;
 - Development of program strategies and designs;
 - Identification of target markets;
 - Development of implementation strategy and plan, with broad consultations;
 - Engagement with implementing agents; and
 - Monitoring and evaluation of program results.
- Program staff need to (a) learn from results to improve program designs and (b) phase out programs that have either achieved their goals or proven ineffective.

A typical program cycle is shown in Figure 4-3



Figure 4-3: The Program Cycle



Source: Authors

Monitoring and Evaluation

Monitoring and evaluation (M&E) is a critical function that enables an EE agency both to be effective and to demonstrate its impact in order to maintain political support and funding levels. *Monitoring* is the process of routinely gathering information on all aspects of the implementation of the EE agency's programs and activities. Monitoring measures the quality and effect of the implementation process and procedures. The agency needs to prepare periodic performance reports, including annual reports to the government, boards and other stakeholders. These reports typically define specific reporting periods and performance indicators.

Evaluation aims to determine whether project objectives set in terms of expected outputs, outcomes, and impact are being or will be met. Evaluation is an important part of good institutional governance and is needed to test planning assumptions, monitor and report overall results, compare program performance, fine-tune implementation processes, and incorporate lessons learned into the agency's future operations. In order to determine program impacts, EE agencies must have sufficient market data to develop credible market baselines. Programs with solid analytical underpinnings and clear and focused objectives are much easier to evaluate.

International experience indicates that, although formal and comprehensive M&E is good practice, only a few EE agencies actually use it routinely. However, several recent policy innovations, such as energy supplier or EE obligations (EEOs) in the EU, are now requiring proper measurement, indicators and evaluations to demonstrate EE impacts as part of policy compliance monitoring.

Key elements of a good M&E program include the following:

- Setting targets based on sound data collection and analysis
- Developing and implementing monitoring and tracking systems
- Developing evaluation methods and tools
- Development of measurement and verification (M&V) protocols
- Evaluating program impacts/results against targets



- Asking both “Are we doing the right things?” and “Are we doing the things right?”
- Feeding back evaluation results to redesign or refocus programs
- Establishing internal evaluation groups to conduct program evaluations
- Engaging independent evaluation entities to evaluate agency performance and results achieved.

Case Studies

In addition to the international review, five case studies were selected for detailed analysis. These case studies represent EE agencies with different institutional frameworks, as shown in Table 4-9. A brief description of each agency is provided below. Additional details are provided in Appendix B.

The Bureau of Energy Efficiency (BEE) is a statutory body within India’s Ministry of Power. In 2001 the Indian Parliament enacted the Energy Conservation Act, which came into force in March 2002. The Act established BEE as the key agency to assist in developing policies and programs that rely on market mechanisms and self-regulation to reduce the energy intensity of the Indian economy and promote EE and conservation.

The French Environment and Energy Management Agency (Agence de l’Environnement et de la Maîtrise de l’Energie, or ADEME) was established in 1992 by merging three environmental agencies created in the 1980s: the French Energy Management Agency (Agence Française pour la Maîtrise de l’Energie), the Energy Saving Agency (Agence pour les Economies D’énergie), and the Air Quality Agency (Agence pour la Qualité de l’Air).²⁴ This merger allowed the agencies to pool their talents and resources and to approach environmental and energy problems using a broader, interdisciplinary framework. The ADEME talent pool today consists of more than 1,000 staff at three central offices in Angers, Paris, and Valbonne; 26 regional branches across France; three offices in France’s overseas territories; and one office in Brussels.

The Energy Saving Trust (EST), formed in 1992 after the Rio Earth Summit, is a non-profit organization with a charitable foundation aimed at promoting sustainable use of energy. The organization is mostly funded by the British government (including the Department of Energy and Climate Change, the Department for Transport, the Department for Trade and Industry, and the Scottish Executive) and also receives some funding from the private sector.

The Korea Energy Management Corporation (KEMCO) is a public organization responsible for the implementation of EE, new and RE deployment, and climate change mitigation policies and measures. It was established in 1980 by the Ministry of Commerce, Industry and Energy under the “Rational Energy Utilization Act.” Its primary function is nation-wide energy management by providing services that vary from technical and financial support to administrative services,

Table 4-9: Case Study Agencies

Institutional Model	Case Study
Independent government agency focusing on EE (under one ministry)	BEE – India
Independent agency focusing on EE (under multiple ministries)	ADEME – France
Independent statutory agency	EST – U.K.
Government-owned corporation with board of directors	KEMCO – Korea, Rep.
Public-private partnership	dena – Germany

Source: Authors

²⁴ ADEME, “20 Years: ADEME Yesterday, Today and Tomorrow,” in ADEME & Vous (Special Issue), May 2012. Accessed from http://www.ademe.fr/sites/default/files/assets/documents/83162_ademe_20ans_gb.pdf.



thereby pursuing an ultimate goal of building an environment-friendly socioeconomic structure. The New and Renewable Energy Center was set up as an affiliate body of KEMCO in 2003. KEMCO was accredited as a Clean Development Mechanism (CDM) Designated Operational Entity (DOE) by the United Nations in 2005 and is one of the top DOEs in the world.

The German Energy Agency (*Deutsche Energie-Agentur GmbH, or dena*) is the center of expertise for EE, RE, and intelligent energy systems. Established in Berlin in 2000, the Agency aims to provide a holistic approach to finding answers to questions surrounding energy efficient transportation systems, electricity, and buildings, energy services, and RE.²⁵ dena's mission is to help maintain economic prosperity in Germany and generate economic growth with lower energy inputs and increased use of RE resources.

How Have the Case Study Agencies Addressed the Gaps?

Section 3 listed a number of important gaps identified by assessing Turkey's institutional framework on the basis of stakeholder interviews. These gaps included the following areas:

- Public sector EE financing and implementation
- Residential sector EE financing and implementation
- Development of guidebooks, tools, templates, etc.
- Monitoring and evaluation
- Development and promotion of ESCOs

Tables 4-10 through 4-12 summarize the ways in which the agencies in the case study countries addressed some of these areas.

Table 4-10: EE Agency Activities - Public and Residential Sectors

Agency	Public Sector	Residential Sector
ADEME	Territorial climate energy plans	Assistance to building professionals for EE construction
	Cit'ergie labeling program	Plan for Habitat Energy Renovation
	Municipal assistance to install EE street lighting	Energy advisory support to public agencies
BEE	Public buildings demonstration project	National energy efficient lighting program
	Municipal DSM program	Super energy efficient appliance program
	EE street lighting guidelines	Guidebooks for energy savings calculations
dena	Roadmap for EE in Buildings for Brandenburg State for the Office for Properties and Construction	Alliance for Building Energy Efficiency
	Developing EE projects for local/public authorities	Stakeholder dialogue for energy efficient products
EST	Best practice guides/advisory support for local authorities	Studies: energy refurbishment of residential buildings
	District heating loan program	Domestic renewable heat premium payment project
	Local authority & housing support program (Wales)	Energy saving advisory service
KEMCO	EE guidelines for energy use in public institutions	EE lighting in social housing
	Joint inspection (with government) of energy consumption in public buildings	Super-energy-efficient appliance deployment (SEAD)
		Performance evaluation of eco-friendly houses
		Green homes program

Source: Authors

²⁵ dena, dena – the German Energy Agency. Competent. Market-Oriented. Implementation-Driven (Berlin, Germany: dena, January 2014). Accessed from www.dena.de/fileadmin/user_upload/Publikationen/Sonstiges/Dokumente/dena_Imagebroschuere_engl.pdf, p. 7.



Table 4-11: EE Agency Activities - TA and M&E

Agency	Technical Assistance	M&E
ADEME	IMPACT software for local governments/businesses	Monitoring and evaluation report for climate change impacts at local and regional levels
	Energy savings best practice information	
	Corporate environmental plan & impact climate tool	
BEE	Best practice guidebooks	Independent verification of energy savings from BEE programs conducted annually by third party agencies selected competitively
	Lists of accredited ESCOs, energy auditors	
	Online newsletter	
dena	Publication of <i>dena News</i>	Monitoring of results of specific projects through detailed measurements
	Wide range of reports and publications	
	Refurbishment roadmap tool	Assistance to municipalities on M&E
EST	Energy saving guidebooks	Independent testing and evaluation of low carbon technologies and EE measures
	Tools (e.g., generation selector, cash-back calculation)	
KEMCO	Policy briefs, best practice guides & annual reports	M&V of GHG emission reductions under the Korea Voluntary Emission Reduction program
	Websites with key energy data & energy saving measures	
	Information sharing centers	

Source: Authors

Table 4-12: EE Agency Activities - Promotion of ESCOs

Agency	ESCO promotion
ADEME	Partnership to establish Technical Industrial Center network
	Working with private sector to implement energy management systems
BEE	ESCO accreditation program
	Performance contracting demonstration projects in public buildings
	Partial risk guarantee fund for ESCO projects
dena	Collaboration with private sector on smart metering
	Database of experts for energy-efficient building refurbishment
EST	Green homes schemes for private landlords
	Advisory service to consumers interested in engaging ESCOs
KEMCO	Training programs, auditing, consulting services, and partnerships with private sector
	Promotion of ESCOs, including financing through Energy Conservation Fund

Source: Authors



Summary of Lessons Learned

The following is a summary of the lessons learned from the international review of EE institutional frameworks and programming:

- There is a *wide range of institutional structures*, even though national EE objectives and market barriers are generally similar across countries. Each model has its own characteristics, along with strengths and weaknesses.
- However, despite these institutional differences, there are several *common attributes of successful EE agencies*. The agencies tend to be autonomous and flexible, visible and accountable, properly staffed and resourced, and collaborative across a variety of stakeholders.
- *EE agency functions are generally similar* across countries and models, dealing with market studies, data collection and analysis, program planning and formulation, program implementation and administration, program evaluation, and reporting.
- There appears to be a trend away from broad-based energy agencies and toward *more-specialized agencies with independent structures*. This allows for easier decision making, staff retention, access to specialized skills, and program implementation.
- *Management boards, with both public and private representation*, are becoming more common to enable a broader range of stakeholders to influence the work program of the agencies. Boards also help to promote consensus-building on approaches, gain buy-in across organizations, and introduce greater accountability through performance reports and reviews.
- *Dedicated funding* for the EE agency needs to be assured to (a) improve predictability (thus facilitating private sector involvement) and (b) allow for long-term programs.
- *Private sector input* into policy formulation and program design, and participation in implementation, are important.
- Although EE agency M&E has not been systematic and well documented, *many agencies are facing increasing pressure to be accountable* for both measuring impacts and ensuring efficiency of use of public funds.
- ESCOs represent one delivery mechanism that can help serve the industrial, commercial and public markets, but it is neither the only one nor a “magic bullet”. *ESCO development requires a long-term commitment* and is complex. Starting with the public sector first, focusing on simpler business models, and fostering ESCOs as service providers rather than financiers have been shown to be effective approaches.

An important conclusion from the international review is that the selection of a particular institutional structure appears to be influenced by:

- The urgency of the need for improved EE implementation and scale-up
- The legislative framework and the government’s commitment to EE
- Prior and existing EE policies and programs
- The organizational structure of energy decision making in the government
- Recognition of the importance of obtaining private sector input
- Recognition of the need for independence and flexibility in decision-making.





5. Assessment of Turkey's Institutional Set-up and Recommendations for Enhancing Its Effectiveness

Institutional Set-Up Relative to International Good Practices

Section 3 documented the existing institutional set-up in Turkey; Section 4 summarized international good practices. This section compares Turkey's current institutional set-up compares with some of these good practices.

1. ***The EE agency should (a) be independent, autonomous and flexible in decision making and (b) have adequate resources, including staff and funding, to carry out its functions and responsibilities.*** As long as all EE functions remain within MENR (largely under GDRE), the EE Department's independence and autonomy will be limited and subject to ministerial bureaucracy. While staffing and funding may be adequate, there is potential for staff rotations to other departments and difficulties in recruiting highly specialized experts for special programs.
2. ***The agency should be dedicated to EE, visible to all stakeholders, and accountable for results.*** Although the existing EE Department within GDRE is dedicated to carrying out EE functions and responsibilities, the "EE" has been dropped from the General Directorate's name, making it institutionally invisible within MENR's organizational chart. Stakeholder interviews suggest GDRE has also faced some competition from other departments within MENR, and other ministries, on EE programming. Finally, the evaluation functions remain underdeveloped, preventing GDRE from reporting impacts on its programs and assessing their cost-effectiveness and overall efficacy—thus limiting its accountability for EE program results as well as its ability to demonstrate successes and justify funding levels.
3. ***The agency should have the capability to engage, collaborate with, and influence a wide range of stakeholders—including relevant government ministries and agencies, regulators and utilities, equipment and service providers, banks, and NGOs.*** While the EECB does include private sector representation in the form of industrial associations, the banking community and civil society are not represented. The EE Law also created an Advisory Committee so GDRE could consult with private sector/NGOs annually; the EE Strategy proposed measures to enhance the Committee's effectiveness, but it does not appear that these changes have yet taken place. Stakeholder interviews indicate a need for greater interagency coordination at the working level. Several outreach efforts, such as *Energy Efficiency Week*, seek to engage with the private sector, but participation in such events has waned. Private sector interviewees requested increased dialogue on EE market challenges and proposed solutions, feedback mechanisms on existing EE programs, and better sharing of experiences and emerging good practices, all of which would enable GDRE to more effectively address current private sector challenges to support EE. Dialogue with banks and consumer groups, and leverage of private sector financing, need to be strengthened.
4. ***The agency needs strong program development, implementation and evaluation functions.*** For an agency to develop successful programs, it needs to be able to conduct market research and data collection, data and barrier analysis, program strategy development, program design and planning, implementation and administration, monitoring and evaluation, and program redesign based on evaluation and changes in market conditions. While GDRE and other



agencies have several ongoing programs—from incentive schemes to tools to information and training—most do not appear to be based on systematic analyses, and most lack both program plans with clear objective statements and ongoing monitoring using indicators and evaluations. Thus it is difficult to determine whether a program has met its goals, what the program impacts are, why some programs have lower-than-expected participation rates, and so on.

5. The agency should have strong management and staff, with proper incentives for good performance. GDRE's ability to showcase its EE-related successes is limited. Ministerial management and staff in general are difficult to remove for poor performance, with limited incentives for outstanding achievement. An independent agency regularly reporting its progress to a board, with management serving three-to-five-year terms (with renewals and modest staff bonuses subject to agency performance), could enhance institutional governance.

It should also be pointed out that, while ministries around the world maintain overall responsibility for energy sector policies including EE, *independent agencies are very often needed for implementing programs*. The independence allows them to operate much more easily than if they are part of an existing ministry. They can more easily engage with relevant stakeholders, hire specialized consultants and firms for various programs, adjust programs as market conditions change, and hire specialized staff dedicated to EE. The government does not currently have an entity that can serve as the primary implementing arm for EE in Turkey.

Good Governance

In addition to the main attributes of good EE agencies, Section 4 also identified five elements of good governance—namely, planning, people, programs, political support, and private sector engagement. Table 5-1 shows how the current institutional set-up in Turkey fares relative to these five elements based on the stakeholder interviews.

Key Institutional Principles for Turkey

Turkey has done a commendable job in establishing a sound legislative and policy framework, creating appropriate institutions, and providing significant funding and support for EE. These actions have resulted in substantial EE gains and other benefits for the country. However, as its programs transition to the next level of maturity and complexity, additional enhancements will be needed.

On the basis of the preceding assessment of Turkey's institutions and relevant global experience, a number of principles are recommended for Turkey. These include:

1. Turkey would substantially benefit from **introducing a more visible and independent EE entity** to serve as the country's primary implementation arm.
2. This EE entity would operate best with a **management board with broad representation**—including all relevant public agencies, the private sector, banks, academia, and civil society—which (a) convenes regularly to approve agency strategies, program plans, and budgets; and (b) receives progress and evaluation reports on agency performance to ensure accountability.
3. Although each ministry—including MENR, MoEU, and MoSIT—will retain its responsibilities under the EE Law, **the EE entity should serve as the government's primary implementing arm**. Ministries can temporarily assign staff to the agency to help develop new programs and ensure that program goals sufficiently align with policy objectives.

**Table 5-1: Assessment of EE Goernance in Turkey**

Function	Key Governance Questions, <i>Situation in Turkey</i>
Planning	<ul style="list-style-type: none"> Are policies/strategies based on publicly available market assessments and analytical reports? <i>Policies are not always based on public studies and assessments.</i> Are institutions accountable for meeting targets, enforcing policies and assessing compliance? <i>Institutions are partially accountable for law compliance and enforcement, but generally not for meeting targets.</i> Are methodologies in place to measure progress towards objectives and targets? <i>No, most are still to be developed.</i>
People	<ul style="list-style-type: none"> Is there an agency dedicated to EE, with sufficient staff/resources? <i>Yes, GDRE does have adequate staff and resources. If new programs and incentive schemes are planned, additional resources will be required.</i> Is there a board or supervisory committee with broad representation? <i>The EECB has broad representation, but participation by some private sector entities (e.g., equipment suppliers), banks and civil society could be strengthened.</i> Can the agency freely hire staff, fire people based on poor performance, pay reasonable salaries, and offer long-term employment? <i>No, GDRE is subject to MENR's human resource procedures; staff may be subject to rotation/reassignment.</i>
Programming	<ul style="list-style-type: none"> Do EE programs have clear goals, plans and targets? <i>No, most do not.</i> Are there requirements for periodic evaluations and adjustments? <i>While the Law does refer to some requirement for evaluations, most have not yet been evaluated.</i> Are results reported regularly and publicly available? <i>Few public reports on program results are available.</i>
Political support	<ul style="list-style-type: none"> Is EE part of broader economic development strategy? <i>Yes, EE is referenced in the 10th Development Plan.</i> Are programs' plans and results reporting at Ministers level? <i>Yes.</i> Is funding for EE stable and predictable? <i>Program funding has generally been consistent and predictable.</i>
Private sector	<ul style="list-style-type: none"> Are private sector consultations part of policy and program formulation? <i>Yes, private sector consultations do take place.</i> Have they been consulted in evaluations? <i>No, since evaluations are still under development.</i> Is private sector expertise/capital being sufficiently leveraged? <i>Not enough; there is much greater scope for leveraging the private sector.</i>

Source: Authors

- The **EE entity would develop and maintain all program functions**—from market analysis to program formulation to implementation and evaluation. Programs should be based on (a) systematic market studies and data analysis; (b) identification of specific policy goals or barriers to be addressed; (c) implementation plans with clear objectives and indicators subject to broad consultation and available to the public; (d) strategic partnerships with the private sector during program implementation (including the outsourcing of highly specialized programs to qualified entities, possibly under performance contracts); (e) third-party evaluations to assess program impacts and effectiveness; and (f) mechanisms for allowing feedback from evaluations and market changes to inform the refinement of programs under implementation.
- The **management team should be subject to periodic agency performance reviews by the board**, perhaps on a medium-term contract (three to five years, for example), with renewal contingent on satisfactory performance and achievement of agreed agency goals. The management team should have the flexibility to hire staff as new programs are initiated, to allow access of specialized, temporary skills, and to fire staff for nonperformance. Good performance should be recognized and, as appropriate, outstanding performance should be rewarded with financial incentives.



6. Efforts should be made for the EE entity to urgently **address currently underserved markets, such as the public and residential sectors**. This includes conducting market assessments, identifying key impediments to EE investments, identifying necessary incentive and financing mechanisms, determining TA needs, and working with private sector and other partners to develop implementation and delivery strategies to serve these sectors.

Institutional Options for Turkey

Regardless of which institutional model it may select, Turkey should adhere to the aforementioned key principles in order to (a) help elevate the country to best practice in terms of its overall institutional set-up and (b) provide a solid foundation for future policy implementation and programming. In terms of institutional models, there are a number of variations for how such an EE entity could be structured in practice, with varying degrees of government independence and ownership. Based on international experience, the following seven models have been identified as potential options for Turkey (Table 5-2). Each is briefly described below along with some pros and cons in italics. It should be emphasized that the options presented are proposed as a potential restructuring of GDRE and not the creation of a completely new entity.

1. Dedicated General Directorate for EE within MENR

This option involves creating a new general directorate within MENR dedicated to EE. This directorate would be at the same level as the current GDRE but would have the responsibility and authority for decision making related to all EE matters. An example of such a model is the Energy Efficiency Department of the Ministry of Industry and Trade in Vietnam; indeed, most EE agencies started as units within ministries but have since become independent. *While such a model could be the easiest to implement and help increase the organizational visibility of EE within MENR, it would be unlikely to provide sufficient autonomy or address such issues as institutional governance, flexibility, and dedicated staff. Use of this model is increasingly rare, and few countries have such set-ups anymore.*

2. Independent EE agency under MENR

This model would involve the creation of an independent agency under MENR, but with a supervisory board consisting of public sector members. The board would have the authority to make certain decisions regarding policies and programs. This structure is similar to India's BEE, the Russian Energy Agency (REA), Thailand's Department of Alternative Energy Development and Efficiency (DEDE), Mexico's Comisión Nacional para el Uso Eficiente de la Energía (CONUEE), and China's Energy Research Institute (ERI) under the National Development and Reform Commission (NDRC). *This option would help achieve greater independence and accountability (through its board), but in practice could still be subject to ministerial influence—to the detriment of its independence and flexibility.*

3. Independent EE agency reporting to multiple ministries

Under this option, a new EE agency would be created jointly by MENR, MoSIT and MoEU, with possible coordination under the Prime Ministry. The agency would be governed by a management board comprising representatives from all three ministries plus other relevant public and private sector representatives, such as members of the current EECB. Examples of this structure include ADEME in France (which reports to the Ministry of Ecology, Sustainable Development and Energy and the Ministry of Higher Education and Research) and the Austrian Energy Agency (reporting to the Ministry of Agriculture, Forestry, Environment and Water and the Ministry of Science, Research and Economy). *This option would help ensure that the EE agency serves as an implementing arm of all the relevant ministries with EE responsibilities, with greater*

**Table 5-2: Institutional Options for Turkey**

Option	Description	International Examples
1	Dedicated general directorate for EE within MENR ("GDEE")	<ul style="list-style-type: none"> Vietnam EE Dept. in Ministry of Industry & Trade
2	Independent EE agency reporting to MENR, with public sector board members	<ul style="list-style-type: none"> India BEE under Ministry of Power Russia REA under Ministry of Energy Thailand DEDE under Ministry of Energy Mexico CONUEE under Ministry of Energy
3	Independent EE agency reporting to multiple ministries (e.g., MENR, MoSIT, MoEU) with public-private board	<ul style="list-style-type: none"> France ADEME Austrian Energy Agency
4	Government-owned enterprise for EE with public board	<ul style="list-style-type: none"> Korea, Rep.: KEMCO South Africa: NEEA Finland: Motiva Norway: ENOVA Spain: IDAE
5	Independent statutory authority with public-private board	<ul style="list-style-type: none"> U.K. EST Energy Conservation Center of Japan Ireland Sustainable Energy Authority Sri Lanka Sustainable Energy Authority
6	Public-private partnership for EE, with public and private shareholders and board members	<ul style="list-style-type: none"> Germany dena Polish National Conservation Agency
7	Small administrative agency with all programming functions outsourced to private sector for implementation under performance-based contracts	<ul style="list-style-type: none"> U.S. state EE utilities South Africa Eskom standard offer program

Source: Authors

accountability and influence through the Prime Ministry and its Board. In practice, however, the appointment of managers, approval of programs, and so on would still be dominated by its public sector Board members, thus reducing some of the agency's independence from the government.

4. Government-Owned Enterprise

This model would entail creating a new public corporation owned 100 percent by the government, overseen by a government-appointed board. The board would consist of public sector representatives, but may include non-shareholder private sector members. The government would enter into a contract with the corporation for a given activity, with payments based on clear deliverables. Examples of this option include the Republic of Korea's KEMCO, South Africa's National Energy Efficiency Agency (NEEA), Finland's Motiva, Norway's ENOVA, and Spain's Instituto para la Diversificación y Ahorro de la Energía (IDAE). *Such a structure creates increased independence and accountability and allows the corporation to earn fees for some programs (training, certification, and conferences/expos, for example), creating increased incentives for providing high quality and efficient services. However, the introduction of a government corporation to provide fee-based services could detract from its role of providing a public good, and could create a perception that a government company is seeking to compete with services that could be provided by existing private companies.*



5. Independent Statutory Authority

Under this model, an independent statutory authority would be established with a public-private board. While similar to an independent agency, such an authority would operate with increased independence from government agencies with greater power assumed by its board. Examples of this structure include EST in the U.K., Ireland's Sustainable Energy Authority, the Energy Conservation Center of Japan (ECCJ), and Sri Lanka's Sustainable Energy Authority. *This model would provide greater independence for operations while allowing for funding to come from sources other than government budget allocations (such as donations, fees, or grants). It would also give public and private sector board members more-equal influence over program activities. Therefore, this model is recommended for further consideration by the Turkish government.*

6. Public-Private Partnership

This option would create a new corporation with both public and private shareholders. Private shareholders would typically be more interested in influencing the EE agency's work rather than earning a return on their investment. The shareholders would appoint a board of directors that would have overall responsibility for oversight and guidance, independent from any government agency. Examples include dena in Germany and the Polish National Energy Conservation Agency. *Under this model, the private sector shareholders would have much greater influence than under the other models, since their influence would be based on the shares they hold. If the corporation were to provide fee-based services, then all shareholders could receive dividends or other financial benefits. This also creates increased accountability for the EE entity to demonstrate results and efficiency. Therefore, this model is also recommended for further consideration by the Turkish government.*

7. Small Agency with Program Outsourcing

Under this model, a small EE agency would be established that would outsource most of the program development and implementation functions to one or more private or public agencies. Examples of this model include the energy efficiency utilities created in the U.S. states of Vermont, Delaware, and Oregon as well as the Standard Offer Program of the South African utility Eskom. Under such arrangements, the contracted implementers would be obligated to measure EE impacts using agreed methodologies, with some contractual provisions for meeting certain targets. *Such an arrangement would allow much greater private sector participation in all aspects of EE programming (design, implementation, evaluation) and greater accountability through contract payments tied to performance. Program implementation would also be subject to competition among bidders, ensuring high-quality program capabilities. However, such a model could substantially disrupt the current EE department and make GDRE's existing capacity partially redundant. Further, it would take time to develop and agree on proper methodologies for program evaluation and impact reporting and to build capacity among potential private sector service providers.*



Recommendations and Conclusions

Regardless of which institutional option the Turkish government selects, the key principles outlined in the institutional recommendations will be critical to ensuring that governance structure and good-practice attributes are in place. These principles will help ensure that the EE entity has sufficient autonomy and flexibility to develop and implement programs, proper resources and staffing, and accountability to assess its overall efficacy and make any necessary adjustments.

In terms of specific institutional models, it is recommended that the government establish either an **independent statutory authority** or a **PPP** to serve as its future EE agency. As indicated in the previous section, both options (5 and 6) would provide sufficiently strong independence and accountability with suitable private sector input and influence. The primary role of the new EE agency would be to serve as the government's implementing arm for EE. This would include all the functions discussed previously: collecting and analyzing energy consumption and EE; sharing information on energy use patterns and EE options; development, implementing and evaluating supporting programs; advising policy makers, end users, financiers, on EE options; providing training and certification programs; and other functions as directed by their board. Boxes 5-1 and 5-2 (at the end of this section) provide additional information on how such entities could be set up and made to function.

The entity would initially be staffed with GDRE employees and possibly supplemented with program staff from MoSIT and MoEU. Staffing would evolve over time on the basis of program needs, skills mix, staff performance, funding, and so on. In terms of programming, each existing EE program would require first board approval, and then a program implementation plan that would set forth clear strategy and objective statements, an outreach plan, target markets and participation rates, an expected program duration, indicators, and an evaluation plan. Implementation plans would be made public once approved by the board, along with annual progress reports and periodic evaluation reports. Strategies and plans would be developed for each of the main sectors—industry, public, residential—within the first six months of operation.

The board itself could be chaired by MENR and have broad representation, including all government agencies with EE responsibilities. Representatives from select industrial associations, banks, consumer groups, academia, and civil society should also be considered. The board will have primary responsibility for oversight of the EE agency, including appointment and renewal of the management team, strategic documents, approval of annual budgets and work plans, approval of all new program plans, review of progress and evaluation reports, and other tasks to reasonably ensure effective operation of the EE agency.

Because the new entity's board would make most of the program-level decisions, the EECB could be transformed into a higher-level EE Policy Committee, possibly chaired by the Prime Ministry, that focuses on issues such as inter-ministerial coordination, policy formulation and updates, and review of regulatory enforcement. This committee could also make recommendations to the EE agency's board in terms of new programming, public information needs on new regulations, and so forth.

The government recently issued detailed action plans for many of the 10th Development Plan's focal areas, including a Program for Improving Energy Efficiency (November 2014). In it, the government calls for GDRE "to be transformed into a stronger structure that will also steer and coordinate energy efficiency activities of other agencies and organizations as well." It further elaborates that



A specialized institutional structure where public, private and non-governmental organizations hold a stake in management and which is administratively and financially strong, will be established under [the] Renewable Energy Directorate General, and all energy efficiency activities will be gathered under this structure. The capacities of real persons and legal entities operating in the field of energy efficiency will be strengthened.”

Although such enhancements will be needed to strengthen the GDRE’s institutional capacity, additional efforts may be needed to achieve parallel enhancements to GDRE’s governance, independence and accountability. Implementing appropriate revisions to the directorate’s structure should be given a high priority to ensure that planned capacity enhancements will have the greatest impact and can be sustained.

While GDRE management does acknowledge many of the identified gaps in EE programming, they believe that the restructuring of EIE to GDRE has now been completed and they are already in the process of implementing a number of the measures recommended in this report, such as increased information sharing and development of monitoring and evaluation plans. Therefore, GDRE’s view is that another restructuring at this time may negatively affect ongoing EE activities and introduce new uncertainties. GDRE would thus prefer that their existing institutional capacity be strengthened in order to address the identified deficiencies.

It should be acknowledged that another restructuring of GDRE, after the one in 2011, will likely have adverse short-term impacts on staff and program performance. However, the development of a new institution based on the principles outlined in this report could also significantly enhance outcomes in the medium-to-long term and is therefore recommended as a necessary investment. Strengthening GDRE without a parallel increase in independence, accountability and flexibility is unlikely to result in an increased rate and effectiveness of EE implementation in Turkey sufficient to meet the government’s ambitious EE targets. MENR has considerable experience with such restructurings, so such potential adverse effects can be minimized.

It is also recognized, of course, that the selection of a specific model will ultimately be a political decision. Nevertheless, the government is encouraged to select an option as early as possible and initiate a transition plan; if done according to the principles set forth in this report, the result should be an enhanced EE institutional set-up and improved program performance that should accelerate the realization of its stated national EE goals and targets. Should deliberations on the various institutional models extend beyond a reasonable timeframe, it could harm EE program performance by creating uncertainty among staff and various stakeholders.

Once a decision is made, development and refinement of the institutional design along with the development of detailed plans—including a transition plan, staffing arrangements, an operations manual, and a business plan—will be necessary. The World Bank and donor community stand ready to support such an endeavor.



Box 5-1. An Independent Statutory Agency

Under this model, an independent statutory agency (ISA) is established by legislation and governed by a government-appointed management board that often comprises both public and private sector representatives. Although an ISA's funding may come from a special allocation, existing ministerial budgets, or independent sources (such as revenues or donations), it is otherwise an independent organization. ISAs typically enjoy increased independence over typical government agencies; this allows them to undertake more innovative programs and activities, be more flexible in responding to changing market conditions, and influence EE efforts across public agencies and private entities. ISAs may also have more-flexible procedures for procurement, hiring and firing, and salary structures. However, increased independence can also imply reduced clout within the government to push for supportive EE policies and measures, budget allocations and political backing.

Set-Up. Legislation would need to be developed and enacted to establish an EE agency as a not-for-profit ISA in Turkey. The agency would be overseen by a management board that could include representatives from related ministries (e.g., MoF, MoEc, MoD, Treasury, MENR, MoEU, MoSIT), the private sector (e.g., industry/professional associations, banks, ESCOs/auditors, utilities, municipalities) and others (e.g., academia, consumer groups, other NGOs). The board would generally meet twice a year to appraise and approve its business plan, new EE program plans, assess progress with existing activities along with periodic external evaluation reports, review staffing and funding levels, and assess management performance. The organizational chart for the new EE agency would depend heavily on what activities and programs the board would decide to undertake. (See sample organizational charts from other countries in Appendix B.)

Funding. Part of the ISA's funding could continue to come through MENR to support its core functions (namely, monitoring of compliance with EE regulations, energy data collection and analysis, training, and review of energy audits/plans), which are assigned to it under the EE Law and supporting regulations, and to partially cover fixed costs such as staffing and overhead. For EE programs, the government or individual ministries (e.g., MENR, MoSIT, MoEU) could request, or the EE agency could propose, specific program plans to address certain market segments or market failures; these might include, for example, awareness/education, administration of grants and subsidies, market studies, or development of tools/guides/case studies. Each program plan would set forth for the government's consideration its objectives, market failure and proposed activities to address it, proposed duration, incremental funding needs, additional staff/consultants, monitoring indicators, and evaluation plans. Once the program is approved, the government would enter into a contract with the agency. The agency could also develop program proposals to be funded by other partners, such as organized industrial zones (OIZs), industrial associations, donors and international organizations, banks, and other entities subject to board consent. If a given program is not performing as expected, the government or board could request, or the agency could propose, that the program be redesigned or cancelled.

Staffing. Initially, the EE staff within GDRE/MENR would be reassigned to the new EE agency. The board would competitively select a chief executive officer (CEO) to run the agency under a three-to-five-year contract subject to annual board review and renewable subject to good performance. In consultation with the board, additional positions could be proposed by the CEO as necessary and with proper justification. Staff would be assigned to various programs as they are approved and funded. Over time, well-performing staff should be eligible for promotions and modest incentive payments; staff who are unable to perform adequately may be reassigned or, if needed, let go. Temporary experts and other consultants may be hired from time to time to help prepare specific program plans, provide inputs into public campaigns and guides/tools, or support the agency during periods of intensive program activities.

Indicative Cost and Benefits. It is difficult to quantify the incremental costs associated with such an institutional change, or the expected impacts. The most important element of the change is that the ISA would be held more accountable for results and impacts rather than inputs/outputs, which then requires that it be sufficiently independent to accept such accountability. Some upfront costs are likely but should be minimal; for example, development and enactment of legislation to create the EE agency as an ISA, initial hiring of the CEO, possible remuneration for some nongovernment board members, and office space should the EE agency have to be moved out of the GDRE (formerly EIE) offices. However, the cost savings and benefits are equally important. Older and outdated programs would be cancelled. Some staff may opt to remain within MENR and be assigned to other departments. Over time, agency budgeting by program should create more-effective programs that lead to better outcomes that use government resources more efficiently. Smarter EE programming should lead to increased EE investments, which will help further stimulate the market and increase economic activity—in terms of new company investments, commercial bank financing, energy audit/consulting studies, equipment manufacturing and supply, and so on. Such increased activity and employment will yield important benefits to the government, as well as the benefits from increased EE: improved energy security, reduced imports, budgetary savings in the energy bills in public facilities, and better environmental stewardship.



Box 5-2. A Public Private Partnership

A public-private partnership, or PPP, is set up as a corporation whose shares are purchased by the government and private sector investors. Alternatively, it could be created as a nonprofit organization, in which case the private sector shares, or equity, would be provided as a way for private firms to support EE market development without necessarily receiving dividends or a high return on investment. The PPP is governed by a board of directors made up of the investors or their designated representatives. Funding can come from a special government budget allocation, existing ministerial budgets, or independent sources (e.g., revenues), but it generally operates like a company. A main advantage of such a structure is the private sector's increased stake in ensuring its efficient and effective operation; also, its status as a corporation would allow it to be flexible and subject to commercial practices for procurement, staffing, and so on. However, conflicts may arise when public and private board members have competing objectives or perspectives for the PPP, and this may make it more difficult for the government to enter into sole-source contracts with it. It may also find it harder to influence public policies given its nongovernmental status.

Set-Up. The PPP would be registered, either as a corporation or a nonprofit entity, according to Turkish law. It would be overseen by a board of directors that would include representatives from the government (e.g., MoF, MoEc, MoD, Treasury, MENR, MoEU, MoSIT) as well as private sector investors that have purchased a minimum number of shares (e.g., industrial/professional associations, private companies, utilities, NGOs). The board would generally meet twice a year to review and endorse the business plan, review new and ongoing EE programs, review staffing and revenue levels, and assess management performance. As with an ISA, the organizational chart for the PPP would depend heavily on what activities and programs the board decides to undertake.

Funding. While part of the funding could continue to come through MENR to support its legally authorized functions (i.e., monitoring of compliance with EE regulations, energy data collection and analysis), most of its operating costs would come from contracts with the government and other entities. As with the ISA option, individual ministries or private clients could request, or the EE Agency could propose, specific EE program plans to address certain market segments or market failures. Once approved, the government or private client would enter into a contract with the Agency based on the final program plan. If the programs do not perform as expected, the client can request, or the Agency can propose, that the program be redesigned or cancelled.

Staffing. Initially, the EE staff within GDRE/MENR would be reassigned to the new EE partnership. The board would competitively select a CEO to run the PPP under a three-to-five-year, renewable contract subject to review by the board. The PPP would develop business plans addressing activities and programs, projected funding and revenues, staffing, and so forth. Well-performing staff should be rewarded for strong performance and low performing staff should be let go. Temporary experts and other consultants could be hired from time to time as e required.

Indicative Cost and Benefits. As with the ISA option, quantifying the incremental costs and benefits associated with such an institutional change is difficult. Some upfront costs are likely but should be minimal, such as developing and enacting legislation to create the PPP, initial hiring of the CEO, and office space should the EE Agency have to be moved out of the GDRE (formerly EIE) offices. Some of these costs can be covered by the sale of the shares to the private sector. Additional revenues from private sector clients may help cover some of the staffing and overhead costs, now borne by MENR. As with the ISA option, the potential cost savings and benefits will be high. Over time, Agency budgeting by program should create much more effective programs that lead to better outcomes with a more efficient use of government resources. Weaker staff will likely be let go. Smarter EE programming should lead to increased EE investments, which will help further stimulate the market and increase economic activity while providing a range of socioeconomic benefits to the government.



References

ESMAP (Energy Sector Management Assistance Program). 2008. *An Analytical Compendium of Institutional Frameworks for Energy Efficiency Implementation*. Washington, D.C.: World Bank.

European Environment Agency. 2011. *“Survey of Resource Efficiency Policies and Approaches” [in EEA Member and Cooperating Countries]: Turkey, Denmark*. <http://www.eea.europa.eu/themes/economy/resource-efficiency/resource-efficiency-policies-country-profiles>.

IEA (International Energy Agency). 2010. *Energy Efficiency Governance*. Paris, France: IEA.

TurkStat Bulletin, April 7, 2014 (<http://www.tuik.gov.tr/PreHaberBultenleri.do?id=16174>).

World Bank. 2011a. *Tapping the Potential for Energy Savings in Turkey*. Washington D.C.: World Bank.

World Bank. 2011b. *Enhancing Institutional Governance for Demand Side Energy Efficiency Implementation in Developing Countries*. Washington, D.C.: World Bank.

World Bank. 2011c. *Improving Energy Efficiency in Gaziantep, Turkey*. Washington D.C.: World Bank.

World Bank. 2013. *Scaling Up Energy Efficiency in the Western Balkans*. Interim Report. Washington, D.C.: World Bank.

World Bank. 2014a. *Western Balkans: Scaling Up Energy Efficiency in Buildings*. Final Report. Washington, D.C.: World Bank.

World Bank. 2014b. *Energy Services Market Development*. Guidance Note. Washington, D.C.: World Bank.

Government of Turkey Laws, Decrees and Decisions

- Law No 5627, dated April 18, 2007, published in Official Gazette 26510 of 02.05.2007
- Law No 4703, dated June 29, 2001, published in Official Gazette 24459 of 11.07.2001
- The Regulation on the Eco Design of Energy Related Products, Published in Official Gazette 27722 of 07.10.2010
- Decision No: 2011/2257, dated 02.09.2011, published in Official Gazette 28130 of 02.12.2011
- Energy Efficiency Strategy Paper, 2012-2023
- 10th Development Plan, published in Official Gazette 28699 of 06.07.2013
- Decision no: KHK/663, published in Official Gazette 28103 of 02.11.2011





Appendix A. Interview Guides

This appendix contains (a) the interview guides used for the government and private sector interviews and (b) a list of people interviewed.

Interview Guide: Public Sector

A. Functions and Responsibilities

1. What are the major functions of your agency or organization related to energy efficiency? Which sectors do these functions cover?
2. Are the functions and responsibilities defined in existing laws or regulations such as the National Energy Efficiency Law or other laws? Please specify and provide copies of the other laws (or indicate where they can be accessed).
3. What is your organization's structure and main responsibilities of the various groups or units within the agency or organization? Please provide us an organization chart.
4. Does your organization: (a) have to review and approve documents provided from energy consumers? (b) have responsibilities for enforcement? (c) if yes, is enforcement carried out by your department or at the local levels? (d) If at the local levels, what support does your agency provide to them?
5. Which other agencies or organizations within your Ministry or in other Ministries have similar or complementary responsibilities? Which laws or regulations define those responsibilities? Are there real or perceived overlaps or gaps?
6. Does the existing institutional and organizational structure provide appropriate guidance and resources for your group or unit to perform the functions and meet the responsibilities?
7. In addition to policy/regulatory formulation, policy implementation, and regulatory enforcement, what other functions does your organization have? Do you collect data from energy users on energy consumption, EE actions, etc.? If so, where is this data kept? Do you provide information to the public on policies and assistance to help them comply?

B. Goals and Objectives

8. Does your agency or organization have specific goals and performance indicators? Are these specified in any laws or regulations or internally developed?
9. Does your department have the authority (or autonomy) to make decisions regarding specific programs (such as financial incentive programs, information dissemination programs, etc.), donor-funded projects, or other activities that will help meet these goals and performance indicators? Can you modify or adjust their design to improve performance? Do these programs have clear objectives, so they can be discontinued when they are met?
10. What specific programs, projects or actions have you taken or are you planning to take to achieve these goals and objectives? For example, do you collect or provide information? Consult with the private sector? Develop tools, guides, etc.? Manage incentive or grant programs? Other actions?
11. Who decides which programs or activities are needed and what approaches should be used? Does your organization reach out to private and other stakeholders in the formulation of these programs and activities? Are these actions done by your staff or do you hire consultants or other experts to help carry out these activities?
12. Do you monitor these policies, regulations and programs to assess results and impacts? If so, what have been the results to date of your activities? Have these activities ever had independent evaluations to measure impacts?



13. What are the incentives or rewards, if any, if your agency or organization meets the goals and performance indicators, and any penalties if it does not?
14. Which initiatives of your agency or organization have worked well? What do you think were the reasons?
15. Which initiatives of your agency or organization have not worked very well? What do you think were the reasons?
16. How could the above initiatives be improved?

C. Interaction with Other Agencies

17. In fulfilling your responsibilities, do you have a need to interact with or coordinate with other agencies or organizations within your Ministry or in other Ministries? What are these needs and how is this coordination accomplished?
18. Are data and information shared freely across ministries? Is this data available to the private sector and the general public?
19. In fulfilling your responsibilities, do you have a need to interact with or coordinate with the private sector? What are these needs and how do you carry out these consultations?
20. Do you feel that the existing mechanisms for such interaction and coordination (e.g., EE Coordination Body) are adequate?
21. What can be done to help you better coordinate your activities with those of other stakeholders?

D. Changes to Current Structure

22. What changes would you suggest in the institutional and organizational structure to improve the ability of your agency or organization to better carry out its responsibilities and help Turkey meet its overall EE targets? How do you think these changes will help?



Interview Guide: Private Sector Organizations

A. Functions and Responsibilities

1. What are the major business lines of your company related to energy efficiency?
2. Which sectors does your firm currently serve? Are there additional sectors your company is interested in serving?

B. Goals and Objectives

3. Does your company have specific goals, objectives and performance indicators related to energy efficiency?
4. What specific projects or actions have you taken or are you planning to take to achieve these goals and objectives?
5. Which initiatives of your company have worked well? What do you think were the reasons?
6. Which initiatives of your company have not worked very well? What do you think were the reasons?
7. What are the main sources of financing for your clients? Is the available financing sufficient? If not, how can it be improved?

C. Interaction with Government Agencies

8. In implementing your goals related to EE, do you have a need to interact or coordinate with any government agencies and their rules, regulations and procedures? What are these needs and how is such interaction or coordination accomplished?
9. Have you benefitted from any EE programs/incentives of any public institutions? Has your firm participated in any government training or other capacity building programs?
10. Do you have a clear idea about the structure, roles and responsibilities of existing government agencies with respect to EE implementation? Do you get any reports or information on EE policies and programs from government agencies?
11. Do you have an opportunity to provide inputs to government agencies regarding policies, regulations, rules, procedures, etc. related to EE? Do you feel the government agencies value such inputs and take them into consideration? How could this process be improved?
12. Would you like to have more input and participation in government decision making regarding EE? How can this best be accomplished?
13. Does the existing government institutional and organizational structure provide appropriate assistance, guidance and/or resources for your company to meet its business goals?
14. Which of the government's EE strategies/programs/incentives have worked well? Why?
15. Which of the government's EE strategies/programs/incentives were insufficient or are not working well? Why? How can they be improved?
16. Does the existing government institutional and organizational structure create any challenges, barriers or uncertainties with respect to performing the functions and meet your responsibilities?
17. How can such barriers of challenges be addressed?
18. What can government do or do better to help further scale-up EE in Turkey? What else is needed to make this happen?

D. Suggested Changes to Current Structure

19. What changes would you suggest in the government institutional and organizational structure that may help improve your company's ability to better carry out its responsibilities and help Turkey meet its overall EE targets? How do you think these changes will help?



- 20.If the government was interested in outsourcing certain government program functions (e.g., program design and implementation, training, publicity, monitoring and tracking, surveys, etc.) would your company be interested in providing such services?
- 21.In reporting private sector responses to the government, can we refer to your company or your name when providing specific feedback, or would you prefer this information to be confidential? (If the latter, we would provide summary feedback to the government for all private sector responses and only list your name/firm as one that was interviewed.)

List of People Interviewed

Name	Institution
<i>Public Sector</i>	
Yusuf Yazar	Ministry of Energy-DG RE
Erdal Çalıkoğlu	Ministry of Energy-DG RE
Coşkun Şentürk/Gürsel Eratak	Turkish Standards Institute
Alev Duzgun	Ministry of Economy
Halil İbrahim Gündogan	Ministry of Energy, EE Department
Murat Becerikli	Ministry of Energy, Foreign Relations and EU Affairs
Atilla Erenler	Ministry of Environment and Urbanization
Serdinc Yilmaz	Ministry of Development
Ferda Ulutas & Merve Bogurcu	TTGV
Pınar Işın & Ömer Özdemir	KOSGEB
Erdoğan Kapsuz	İller Bank
Ayşe Berrin Dikmelik	Ministry of Finance
Ayşe Ünal	Union of Turkish Municipalities
Zühtü Bakır	Ministry of Science, Industry and Technology
Ali Fidan/Şahin Arsal	Ministry of Interior – DG of Provincial Administration
Barış Umut Çoban	Ministry of Transport
Mustafa Yalçın and Efendi Gümüş	Ministry of Economy
Nakibullah Mahdum	Undersecretary of Treasury
<i>Private Sector</i>	
Ali Naci Işıklı	Association of Energy Management
Arif Kunar	VENESCO
Bülent Bulut, Nilüfer Salbaş & D.Benzer	Cement Manufacturers' Association
Serpil Çimen	Steel Manufacturer Association
Ertuğrul Şen	İZODER
Cihan Karamık	Schneider Electric
Deniz Ege İnan	Halkbank
Germiyan Saatçioğlu	Turkish Ceramics Federation
Siemens Team	Siemens
Rifat Öztaşkın	White Goods Manufacturers Association
Metin Alımlı	Vakıfbank
A.Kadir Sarı	Ziraat Bank



Appendix B. Case Studies of Energy Efficiency Agencies

This appendix presents the detailed case studies of the following five EE agencies:

1. ADEME, France
2. Bureau of Energy Efficiency, India
3. dena, Germany
4. Energy Saving Trust, United Kingdom
5. KEMCO, Republic of Korea

France: The Environment and Energy Management Agency (ADEME)

Overview

France established its Environment and Energy Management Agency (Agence de l'environnement et de la maîtrise de l'énergie, or ADEME) in 1992 by merging three environmental agencies created in the 1980s: the French Energy Management Agency (Agence française pour la maîtrise de l'énergie), the Energy Saving Agency (Agence pour les économies d'énergie), and the Air Quality Agency (Agence pour la qualité de l'air).²⁶ This merger allowed the agencies to pool their talents and resources and to approach environmental and energy problems using a broader, interdisciplinary framework. The ADEME talent pool today consists of more than 1,000 staff at three central offices in Angers, Paris, and Valbonne; 26 regional branches across France; three offices in France's overseas territories; and one office in Brussels.

ADEME operates as a public agency under the joint authority of the Ministry for Ecology, Sustainable Development, and Energy, and the Ministry for Higher Education and Research. The agency is governed by a Board of Administration consisting of ten representatives of state ministries, three representatives of local authorities, two parliamentary representatives, five other "qualified experts," and six members elected from ADEME's staff. It also has a 15-member Scientific Council.²⁷

ADEME offers companies, public authorities and individuals its technical skills, advice and support for project implementation, as well as financial assistance for projects, in order to help them implement EE solutions best suited to their needs. It also provides tools to support research and fieldwork. In addition, ADEME provides training, conducts community awareness campaigns, and spreads knowledge about the most effective EE practices and technologies. ADEME's focus areas are energy, air, noise abatement, transport, waste management, polluted soil and sites, and environmental management. ADEME works to support implementation of France's national policy on the rational use of energy and to encourage public, business, industry, and government bodies to save energy and use RE sources.

ADEME's efforts are supported by a number of energy and environmental policies. For example, the French government has agreed to a 17 percent reduction in final energy consumption²⁸ by 2020. The nation is also committed to complying with the terms of the European Union (EU) energy-climate package developed in 2008 and to improving energy efficiency by 20 percent by 2020.²⁹ Additionally, France aims to reduce its energy intensity (energy consumption per unit of GDP) by 2 percent each year until 2015 and then 2.5 percent per year until 2030.

26 ADEME, "20 Years: ADEME Yesterday, Today and Tomorrow," in ADEME & Vous (Special Issue), May 2012. Accessed from http://www.ademe.fr/sites/default/files/assets/documents/83162_ademe_20ans_gb.pdf.

27 ADEME, Key Facts 2012 Activity Report (Anger, France: ADEME, June 2013), p. 66.

28 Final energy consumption covers all energy supplied to the final consumer for all energy uses.

29 "Note from the French Authorities. Subject: Implementation of Directive 2012/27/EU on energy efficiency – Communication from the French authorities of their Annual Report (Article 24 of the Directive)" (2013). Accessed from http://www.iea.org/media/pams/france/fr_2013report_en.pdf



Policy Formulation and Implementation

ADEME assists in policy formulation in France by providing scientific, technological, financial, and energy business-related advice and information. The agency also prepares documents and implements programs that can lead to the development of community initiatives in France as well as throughout Europe. ADEME does not directly implement policies or projects.

Information Collection and Dissemination

Data collection is an inherent part of the research projects and programs conducted by ADEME and its partner organizations. Some data are distilled and reported in its publications, whereas some are used to develop best practices, to improve programs, to support policy proposals, or to create the tools it offers for use to businesses and the general public.

ADEME publishes a quarterly newsletter, *ADEME & Vous*, that addresses topics of interest to companies, local and regional authorities. Each issue updates readers on ADEME activities and provides in-depth information about one topic of concern. The ADEME website provides “Examples to Follow,” case studies of projects aimed at reducing energy use. These are intended to “promote and disseminate good practice in the areas of environment and energy management.”

ADEME also provides a number of synthesis and analytical reports on its website, most available in English and French. Topics range from cement industry NO_x emissions to energy for sustainable development to the economic impact in France of recycling plastic packaging.

Funding

In 2012, ADEME received €93.7 million (about US\$129.3 million) for “Means” and €686 million (US\$946.3 million) for Incentives. About 96 percent of its annual funding comes from the French government (French Ministry of Ecology and Sustainable Development, the Ministry of Industry, and the Ministry of Higher Education and Research, 3 percent is sourced internationally, and 1 percent comes from private sources.³⁰ The government funds come from taxes on vehicles and on the domestic consumption of natural gas.³¹

Grants and Incentives

In 2012, ADEME had a budget of €686 million (US\$946.3 million) for incentives for a variety of energy and environmental projects. For example, businesses could apply for a grant for solar thermal water heaters in the amount of €350 per square meter.

ADEME has been entrusted by the State with the management of future investments in the following areas:

- €1 million for solar power, wind energy, marine energy, geothermal, carbon capture, storage and recovery of CO₂, bio-based chemistry, the hydrogen vector, energy storage, buildings and industrial processes;
- €165 million to promote experimentation and research for the integration of intermittent renewable energy sources (wind, solar, etc.) in electricity networks and the development of smart products and services to control consumption electricity;
- €210 million to support innovative solutions and demonstration projects relating to recycling and recovery of waste, remediation of soil, groundwater and sediment applications eco-design and industrial ecology;
- €950 million to promote the development of technologies and innovative and sustainable (low carbon) solutions for land and sea travel.³²

³⁰ Agence de l'Environnement et de la Maîtrise de l'Energie – Angers.” Accessed from: www.managenergy.net/actors/150

³¹ “Organisation: Agency for Environment and Energy Management (ADEME).” European Union ERAWATCH. Accessed from: http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/fr/organisation/organisation_mig_0020



In 2012, ADEME's regional management and the Picardie regional council committed to experimenting with the creation of an "energy efficiency public service." This service is designed to remove impediments to single-family home energy rehabilitation projects, including coordinating the services of contractors and having to pay for the project up-front. Throughout 2012, the regional agencies undertook feasibility studies to identify a mechanism that would pay for the work on behalf of the homeowner and then receive payments from the homeowner based on the energy savings achieved.

Training Programs

ADEME organizes formal training in energy and environmental issues for companies, NGOs, public authorities, and the general public. It also provides information sharing opportunities and conducts awareness raising campaigns. In 2012, 3,800 individuals participated in ADEME training sessions and another 7,600 participated in seminars, technical sessions, or conferences.³³ ADEME also publishes informational guides; for example, "Healthy Air at Home" and "Successfully Undertaking a High-performance Renovation" were added in 2012.

Guides/Tools

A part of ADEME's mission is to develop practical tools and determine best practices based on the research projects and fieldwork with which it has been involved. It disseminates these to broad audience. For example, ADEME developed its IMPACT software to help local governments and businesses assess the energy and environmental impacts of vehicle fleets. The Corporate Environmental Plan (PEE), designed in cooperation with chambers of commerce, allows businesses to assess their existing situation under an Environmental Management System. "Impact Climat" is a tool that can be used to assess the impact of climate change on a territory. ADEME's Energy Info Points (*Espaces Info Energie*, EIE) provides the general public with best-practice energy savings information for their day-to-day lives.

Stakeholder Consultations

A variety of stakeholders are involved in all of ADEME's activities. The agency works with local, regional, and national authorities on the design and implementation of energy management and environmental protection projects. ADEME works with industries and individual businesses to improve energy efficiency, reduce emissions, limit waste, and implement management systems. ADEME keeps the general public aware of the latest information on energy efficiency programs and technologies and informs them on where they can find additional details to address their specific questions.

Monitoring and Evaluation

ADEME indicates on its website that it "operates under the framework of bilateral cooperation agreements or international programs, and uses all available leverage to develop and monitor energy management policies; voluntary agreements, regulations, tax incentives, special rates and financial incentives...."³⁴

ADEME also prepares monitoring and evaluation reports for climate change impacts at local and regional levels.

32 For more details see "Resolution 10-5-3 30 November 2010, Amended by . . . Resolution No. 13-4-4 October 10, 2013, Future Investments: Rules Relating to Device Allocation of Aid." Accessed from http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DADEME%26biw%3D1438%26bih%3D627&rurl=translate.google.com&sl=fr&u=http://www2.ademe.fr/servlet/getBin%3Fname%3D2C3AE86062CDCD623E8B918806D9BFAB_tomcatlocal1384769193143.pdf&usg=ALkJrhhP8mLqiSZdwF1-HaCn45KifEHbPw.

33 Key Facts 2012 Activity Report (Anger, France: ADEME, June 2013), p. 5.

34 "Energy Management: ADEME's activities." Accessed from: <http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=17587#qst2>



Energy Efficiency Programs

In general, according to the information provided on the website, ADEME's activities target primarily national and regional cooperation efforts. It shares its expertise and resources with local authorities, government bodies, industry professionals, research bodies, trade organizations, large developers, certification bodies, consumer associations, and banks. It functions as a resource center, providing coordination, encouraging collaboration, and conducting communication campaigns.³⁵

Public Sector Programs

ADEME's public sector programs include the following:

- Assistance in the development of Territorial Climate Energy Plans (PCET) for public agencies;
- The *Cit'ergie* labeling program—a “good conduct” label for public bodies (municipalities or groups of municipalities) that actively contribute to improving their sustainable energy policy in line with climate-related goals; and
- Assistance for municipalities that are renovating and modernizing their street lighting.

Residential Sector Programs

ADEME's buildings initiatives focus on new construction (residences and commercial buildings) as well as the current stock of residences and commercial buildings. The agency works with building industry professionals to increase the thermal and EE of buildings and to ensure that new buildings meet more-stringent standards for heating and electricity use. In addition, ADEME has determined that the building sector will be key to meeting France's energy and CO₂ emissions reduction goals by 2030. In particular, it will be critical to reduce the heating load of new and existing buildings.³⁶ ADEME will be working at both the national and local levels to implement the Plan for Habitat Energy Renovation (PREH).

Private Sector (including ESCOs)

ADEME has created a partnership with the private sector to establish the Technical Industrial Centre (CTI) network. Also, ADEME is cooperating with the private sector to implement energy management systems.

Enforcement

ADEME has no enforcement responsibilities.

Coordination with Other Agencies

ADEME has formed partnerships with other agencies, professional organizations, political parties, public authorities, environmental and consumer associations, public research and educational groups in an effort to achieve its environmental and energy goals. Such partnerships can take the form of collaborative efforts, cross-sectoral framework agreements, or co-founded organizations (research foundations, interest groups, etc.). Examples include an alliance with France's Professional Association of Car Manufacturers to reduce GHG emissions; research and development support in conjunction with the National Institute for the Industrial Environment and Risks (INERIS) and the Agricultural and Environmental Engineering Research Agency (CEMAGREF); and work with SME Development Bank (BDPME), EDF, and Charbonnage de France to implement a guarantee fund for investments in energy management.

35 “Charter Agreement on Objectives between ADEME and the State, 2007 – 2010.” Accessed from: <http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=17550>

36 Key Facts 2012 Activity Report, p. 7.



Organizational Structure

Figure B-1 illustrates ADEME's organizational structure.

Figure B-1: ADEME Organizational Structure as of February 2014



Source: <http://www2.ademe.fr/servlet/KBaseShow?sort=-&cid=96&m=3&catid=17614>.



India: The Bureau of Energy Efficiency

Overview

The Bureau of Energy Efficiency (BEE) is a statutory body within India's Ministry of Power. In 2001 the Indian Parliament enacted the Energy Conservation Act, which came into force in March 2002. The Act established BEE as the key agency to assist in developing policies and programs that rely on market mechanisms and self-regulation to reduce the energy intensity of the Indian economy and promote energy efficiency and conservation.

Specifically, BEE's responsibilities are to:

- Provide policy recommendation and direction for national energy conservation activities;
- Coordinate policies and programs for the efficient use of energy with stakeholders;
- Establish systems and procedures to verify, measure and monitor EE improvements;
- Leverage multilateral, bilateral and private sector support to implement the Energy Conservation Act of 2001; and
- Demonstrate EE delivery systems through public-private partnerships.

BEE plays both promotional and regulatory roles. Its promotional functions include preparing educational curricula or training programs on the efficient use of energy or the conservation of energy, developing testing and certification procedures, formulating demonstration projects or pilot programs to show the energy savings that can be obtained from a variety of technologies, and providing financial assistance to institutions that adopt energy efficient practices or equipment.

Its regulatory functions include developing performance standards and labelling for appliances and equipment, creating a national Energy Conservation Building Code, setting the guidelines surrounding mandatory energy audits, and certifying energy managers and energy auditors.

The direction-setting and management of the BEE falls to the Governing Council, a body of 20–26 members appointed by the Central Government.³⁷ The members are listed below to enable comparison to governing boards of the other case studies:

(a) the Minister in charge of the Ministry or Department of the Central Government dealing with Power; (b) the Secretary to the Government of India, in charge of the Ministry or Department of the Central Government dealing with Power; (c) the Secretary to the Government of India, in charge of the Ministry or Department of the Central Government dealing with Petroleum and Natural Gas; (d) the Secretary to the Government of India, in charge of the Ministry or Department of the Central Government dealing with Coal; (e) the Secretary to the Government of India, in charge of the Ministry or Department of the Central Government dealing with Non-conventional Energy Sources; (f) the Secretary to the Government of India, in charge of the Ministry or Department of the Central Government dealing with the Atomic Energy; (g) the Secretary to the Government of India, in charge of the Ministry or Department of the Central Government dealing with the Consumer Affairs; (h) Chairman of the Central Electricity Authority; (i) Director-General of the Central Power Research Institute; (j) Executive Director of the Petroleum Conservation Research Association; (k) Chairman-cum-Managing Director of the Central Mine Planning and Design Institute Limited; (l) Director-General of the Bureau of Indian Standards; (m) Director-General of the National Test House, Department of Supply, Ministry of Commerce and Industry, Kolkata; (n) Managing Director of the Indian Renewable Energy Development Agency Limited; (o) one member each from five power regions representing the States of the region to be appointed by the Central Government; (p) such number of persons, not exceeding four as may be prescribed, to be appointed by the Central Government as members from amongst persons who are in the opinion of the Central Government capable of representing industry, equipment and appliance manufacturers, architects and consumers; (q) such number of persons, not exceeding two as may be nominated by the Governing Council as members; (r) Director-General of Bureau.

³⁷ "The Energy Conservation Act of 2001, No. 52 of 2001." (29 September 2001) The Gazette of India Extraordinary. Accessed from: http://www.and.nic.in/Citizen%20Services/rTIact2005/ElectricityAct/EC_Act.pdf.



Within the National Action Plan on Climate Change (NAPCC) adopted in 2008, the National Mission for Enhanced Energy Efficiency (NMEEE) was launched, including several targets for 2014–15: annual fuel savings of at least 23 Mtoe, a cumulative avoided electricity capacity addition of 19,000 MW, and a CO₂ emission mitigation of 98 Mt. These numbers amount to a 5 percent energy reduction by 2015.^{38 2}

Policy Formulation and Implementation

BEE was established to advise the government on policy formulation related to energy efficiency and conservation, particularly in the areas of norms for consumption standards, labelling of equipment and appliances, the establishment of building conservation codes, specifying the qualifications and certification procedures for energy managers and energy auditors, setting the timing of energy audits, and specifying the groups of energy users to be referred to as “designated consumers” and the energy reporting requirements for them. (Designated consumers consist of high-energy users in the following categories: thermal power stations, fertilizer manufacturers, cement producers, iron and steel manufacturers, chlor-alkali producers, aluminum manufacturers, railways, textile producers, and pulp and paper mills.)

BEE does not play a role in the implementation or enforcement of these EE policies.

Information Collection and Dissemination

BEE publishes a quarterly online newsletter, BEELINE, with articles on topics ranging from news on new initiatives to photos of energy efficiency events to displays of winning artwork from a children’s competition. BEE also provides information on its website about its programs in demand-side management (DSM) in the municipal and agriculture sectors, the latest news updates related to energy efficiency, information about equipment standards and labelling requirements, and information needed for energy managers and auditors. A list of accredited auditors can also be found on the site. Members of the “designated consumer” sectors can find links to presentations made on topics of interest to them as well as “best practices” articles on exemplary companies in that sector.

Funding

The estimated budget for 2012–13 was Rs. 1,582 crores (about US\$260 million).³⁹

Grants and Incentives

The National Mission for Enhanced Energy Efficiency (NMEEE) is one of eight missions under India’s climate change action plan, which took effect in 2010–11.⁴⁰ The Ministry of Power and BEE have been entrusted with implementing this mission in an effort to further focus on energy efficiency and to provide funding for related programs. Programs under NMEEE are:

- The Perform, Achieve and Trade (PAT), a market-based mechanism designed to enhance the cost effectiveness of improvements in EE in energy-intensive large industries and facilities, through the issuance of energy savings certificates that can be traded;
- Market Transformation for Energy Efficiency (MTEE), which leverages financial instruments such as the Clean Development Mechanism (CDM) to help make energy efficient appliances affordable and increase their levels of penetration;
- The Energy Efficiency Financing Platform (EEFP), which uses energy savings to pay for EE projects;
- The Partial Risk Guarantee Fund (PRGF), a risk-sharing mechanism that lowers the risk to the lender by guaranteeing partial repayment in case of loan default. The repayment guarantee lowers one of the barriers (perception of high risk) to accessing commercial financing for EE projects

38 “Trends in Global Energy Efficiency 2011: India – Energy Efficiency Report.” Accessed from: <http://www.enerdata.net/enerdatauk/press-and-publication/publications/2011-trends-in-global-energy-efficiency.pdf>

39 http://beeindia.in/content.php?page=about_bee/about_bee.php?id=1 (1 crore = 10 million; 1 U.S. dollar = Rs. 60 (approx.))

40 “Energy Conservation.” Accessed from: <http://powermin.nic.in/Energy-Efficiency>



and helps the financial institutions build their capacity and knowledge base regarding EE project financing; and

- The Venture Capital Fund for Energy Efficiency (VCFEE), which provides equity capital to support EE companies or projects, co-investing with private venture capital firms.

Training Programs

BEE provides training materials for energy managers and energy auditors on its website. The training programs for those positions are offered by technical colleges and universities across India.

Guides/Tools

Links on the BEE website take users directly to portals for the CFL exchange program, a page that allows consumers to calculate the energy consumption of a wall air conditioning unit, the star rating calculator, and information about energy manager and energy auditor training and certification programs.

Monitoring and Evaluation

BEE conducts a formal evaluation of its programs annually. Independent third-party evaluation agencies are selected on a competitive basis annually to conduct an evaluation of the prior year programs and to estimate and report the energy savings achieved.

Energy Efficiency Programs

The majority of BEE's programs are directed at large-scale energy users in the industrial and transportation sectors, the designated consumers. BEE has also conducted a series of informational, awareness building workshops for small to medium sized enterprises. Currently BEE is implementing (in cooperation with the Small Industries Development Bank of India) a GEF program for capacity development and financing of EE in SMEs.

Public Sector Programs

BEE has conducted a demonstration program for public buildings EE improvement using the performance contracting model. This program covered a number of high profile central government buildings.

BEE has also sponsored a municipal DSM project in the state of Gujarat. Another BEE activity has been the development of guidelines for improving the efficiency of street lighting.

Residential Sector Programs

BEE initiated a national EE lighting program named "Bachat Lamp Yojana" to promote energy efficient lighting in India, primarily at the household level. This program involves replacement of incandescent bulbs with compact fluorescent lamps (CFLs) as well as a plan to dispose of the CFLs at the end of their useful lives.

BEE also has produced product and appliance labelling for air conditioners, freezers, lamps, and other appliances. BEE is currently cooperating with the World Bank on the Super Energy Efficient Appliances program.

BEE has produced guidebooks for energy savings calculations in homes.

Private Sector (including ESCOs)

In 2009, BEE initiated an Agricultural DSM program in Karnataka, focused mainly on the efficiency of pumps used for irrigating fields. Energy audits were conducted and poorly performing pumps and motors were replaced, free of charge, with BEE Star labeled ones.

As mentioned above, BEE implemented a pilot program for implementing EE in public buildings using the performance contracting approach. Energy service companies (ESCOs) were selected using a competitive bidding process to implement these projects.



The Energy Efficiency Financing Platform (EEFP), part of the National Mission for Enhanced Energy Efficiency, is designed to be used in conjunction with ESCOs to improve EE in India. Under the EEFP, BEE has developed the Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) and the Venture Capital Fund for Energy Efficiency (VCFEE). The PRGFEE is designed to provide risk sharing for commercial lenders to reduce their risk in financing EE projects. The VCFEE is designed to make equity investments (in cooperation with private venture capital funds) in EE technology companies or EE projects.

BEE is also working to standardize the methodology that will be used to audit the buildings considered for the EEFP as well as to verify the performance and impact of EE measures put in place. A standard performance contract is also being designed.

BEE has implemented a scheme for registration and accreditation of ESCOs. Over 100 ESCOs are currently accredited.

Transportation Programs

Railways were designated as one of the nine groups of high-energy-using “Designated Consumers” under the Energy Conservation Act of 2001. As such, the rail sector must appoint an energy manager and must submit reports detailing the status of its energy consumption to BEE and a designated state agency at the end of each fiscal year as well as the actions they have taken to reduce that energy consumption.

Enforcement

BEE is not an enforcement body. BEE is mainly responsible for informational and technical support for implementing the Energy Conservation Act of 2001, which relies mainly on self-reporting and market mechanisms for enforcement.

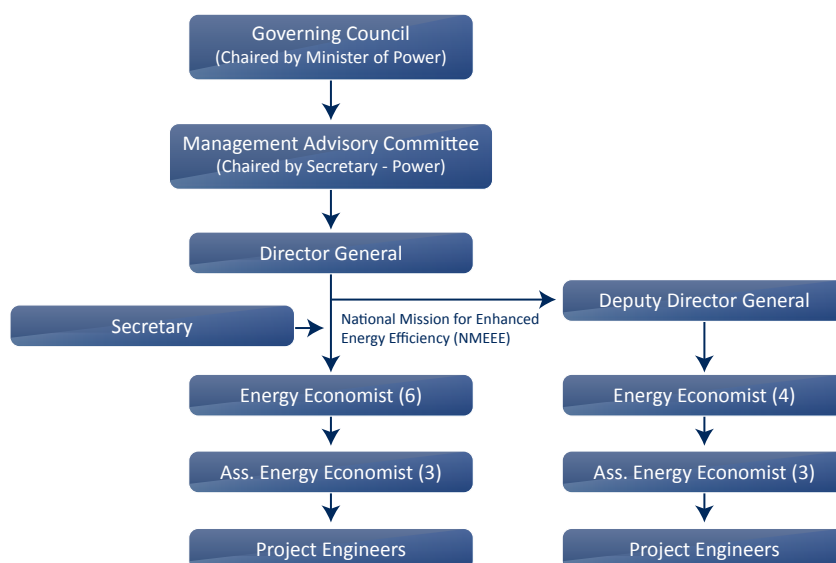
Coordination with other Agencies

The breadth of the mandate for BEE and the types of policies with which it has been involved seem to indicate coordination with other agencies. However, such partnerships are not called out in BEE materials.

Organizational Structure

The organizational Structure of BEE is shown in Figure B-2.

Figure B-2: BEE Organizational Structure



Source: BEE website.



Germany: the German Energy Agency (dena)

Overview

The German Energy Agency (Deutsche Energie-Agentur GmbH, or dena) is Germany's center of expertise for EE, RE, and intelligent energy systems. Established in Berlin in 2000, the agency aims to provide a holistic approach to finding answers to questions surrounding energy efficient transportation systems, electricity, and buildings, energy services, and RE.⁴¹

dena acts as the interface between business and politics in working to achieve Germany's energy efficiency goals. Germany's Second National Energy Efficiency Action Plan (NEEAP), in accordance with the EU Directive 2006/32/EC on energy end-use efficiency and energy services (ESD), has set the target of reducing primary energy consumption by 20 percent by 2020 and by 50 percent by 2050, both compared to 2008. Additional EE and RE goals include:⁴²

- A 25 percent cut in Germany's electricity consumption by 2050 (compared to 2008 levels) with an interim target decreasing consumption by 10 percent by 2020;
- A doubling of the rate of energy-efficient refurbishment of buildings with the aim of a virtually climate-neutral building stock by 2050;
- A 40 percent reduction in the final energy consumption in the transportation sector by 2050 (relative to 2005 levels) and an increase of over five million electric vehicles by 2030;
- A 20 percent reduction in the final energy requirement of buildings by 2020, and 60 percent by 2050; and
- An 80 percent share of renewables in the electricity supply by 2050.

dena achieves these objectives using a staff of 185 engineers, physicists, economists, ecologists, geographers, architects, lawyers, political scientists and communication experts.⁴³ Overseeing this staff is a nine-member supervisory board currently consisting of the State Secretary at the Federal Ministry of Economic Affairs and Energy; two members of the Board of Management of KfW Bankengruppe; the former State Secretary at the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety; the State Secretary at the Federal Ministry of Transport and Digital Infrastructure; the Chairman of the Board of Management of the Deutsche Bank Foundation; the State Secretary at the Federal Ministry of Food and Agriculture; the CIO Infrastructure Equity of Allianz Global Investors Group GmbH; and a member of the Board of Management of DZ Bank AG.

The agency operates as a for-profit company whose shareholders are the Federal Republic of Germany (50 percent) (represented by the Federal Ministry for Economic Affairs and Energy in consultation with the Federal Ministry of Food, Agriculture and Consumer Protection, the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, and the Federal Ministry of Transport and Digital Infrastructure, KfW Bankengruppe (26 percent), Allianz SE (8 percent), Deutsche Bank AG (8 percent), and DZ Bank AG (8 percent).

Policy Formulation and Implementation

Although dena does not have a direct role to play in setting EE and RE policy, it does influence policy through its publications, press releases, media campaigns, and its project choices. For example, in 2012 and again in 2014, dena published updates on the status of subsidies provided to solar photovoltaics (PV) worldwide. "Biomethane: The Energy System's All-rounder," published in 2013, explored reasons for combining biogas with natural gas in Germany's distribution system. In an April 2014 press release, dena's chief executive spoke out in favor of expanding rather than abolishing the tax bonus for skilled tradesmen as a key step in achieving the EE goals for the building sector. Dena also participates in the discussions of some legislative processes, promoting the exchange of information among stakeholders, and sharing lessons learned with designated task forces.

41 "dena – the German Energy Agency. Competent. Market-Oriented. Implementation-Driven." (January 2014) Berlin, Germany: Deutsche Energie-Agentur GmbH (dena). Accessed from http://www.dena.de/fileadmin/user_upload/Publikationen/Sonstiges/Dokumente/dena_Imagebroschuere_engl.pdf, p. 7.

42 Ibid, p. 8.

43 Ibid, p. 31.



In a similar manner, dena supports the implementation of German and EU policy in a variety of ways, such as:

- Reduction goals;
- Overseeing collaborative projects to turn existing buildings into net zero energy buildings;
- Collaborating on a study of the cost of a national rollout of smart meters; and
- Partnering with the technical universities to study the impacts on the electrical grid of increased distributed generation, and to determine the role to be played by DSM, storage technologies, and other systems services.

Information Collection and Dissemination

dena publishes a newsletter, *dena news*, five times a year on its website. dena also provides easy access to the agency's press releases and publications on topics such as subsidies for solar PV, biofuels, German RE industries, and the integration of RE into the electric grid. dena also works closely with clients to prepare media campaigns appropriate to their projects. These campaigns have included hotlines for answering questions, topic-specific workshops, technical seminars, the development of pilot projects to demonstrate technologies, field studies and the associated reports, brochures, and online information portals.

Funding

In 2013, the total revenue for dena stood at €19.2 million (about US\$26 million). The financial support for dena's projects comes through a large number of partnerships from the public and private sectors. Between 2005 and 2013, on average, 50 percent of the revenue came from public grants and 50 percent from cooperation with private partners. In 2012 dena collaborated with over 800 private partners, particularly with energy supply companies, mechanical and plant engineering firms, and the RE sector.

Grants and Incentives

dena does not offer grants or incentives itself, but can inform its clients about where to look for funding opportunities.

Training Programs

Training is often a part of the projects in which dena is engaged. Two programs were designed with a specific training component. The Solar Roofs Program, in place since 2004 and backed by the German Federal Ministry of Economics and Technology, promotes the use of solar PV outside of Germany. Training programs accompany the technology transfers. dena has also been working with the Chinese to develop programs related to energy efficient building techniques, technologies, and standards.

Guidebooks/Tools

dena publishes a wide range of studies and reports on EE and RE. dena has developed a number of internet based tools that can be used in support of EE and RE projects.

Stakeholder Consultations

The nature of dena's mission requires that the agency interact and consult with stakeholders. Indeed, "dena is developing EE and RE markets in cooperation with stakeholders from the worlds of politics and business and from society at large."⁴⁴ The engagement of these stakeholders is necessary to optimize the entire energy system over the long term, develop efficient and financially viable solutions to the challenges faced, and to provide support as the process of transformation takes place.⁴⁵

Monitoring and Evaluation

Monitoring of results is often an integral part of projects in which dena participates. For example, the agency assisted a study of energy consumption data for 1600 heating, ventilation and air conditioning systems to provide benchmark data against which savings can be measured.

44 "About dena." Accessed from <http://www.dena.de/en/about-dena.html>.

45 Stephan Kohler. "Energy System in Flux." dena news, no. 2, 2010. Accessed from: http://www.dena.de/fileadmin/user_upload/Newsletter/pdf-ausgaben/englisch/DEN_NL_1002_engl_Web_01.pdf



dena also assists its municipal clients in evaluating and managing their energy needs using its community-scale Energieeffizienz-Kommune approach.⁴⁶

Energy Efficiency Programs

Since 2008, dena has been developing a comprehensive quality assurance program leading to energy certificates for buildings. The certificates inform prospective tenants or buyers of the energy costs they are likely to face, before they agree to lease or buy the space. The certificates also give public and private owners information about areas where they could begin to improve the energy usage of their buildings. In 2014, it will be mandatory to provide tenants and buyers with such a certificate.

Public Sector Programs

The state-owned Brandenburgischer Landesbetrieb für Liegenschaften und Bauen (BLB)—the Brandenburg State Office for Properties and Construction—commissioned dena to draw up a roadmap that would lead to the reduction of its primary energy use by 20 percent and its final energy consumption by 23 percent by the year 2030. Increasing the EE of its buildings will be a major part of this energy reduction: BLB manages over 200 state properties and roughly 700 state-owned buildings. dena also provided technical assistance to local authorities and public agencies in developing EE projects.

Residential Sector Programs

Dena has conducted a number of studies of energy-efficient refurbishment of residential buildings. It has also established the Stakeholder Dialogue on the Advancement of EE Products, and created the Alliance for Building Energy Efficiency (GEEA).

dena is cooperating in the EU COHERENO (Collaboration for housing nearly zero energy renovation/Refurbishment from a single source) project, which aims to demonstrate that it is possible to transform the existing house stock into nearly net zero structures using cooperative business models. EU COHERENO will identify planners, consultants, and financiers that can collaborate and cooperate to form working groups. These will be presented to homeowners or building owners as single units with whom they will contract to execute their refurbishment projects.

Private Sector (including ESCOs)

dena has not participated in ESCO activities or projects in Germany. However, the agency partnered with German ESCOs to provide training for the Russian supra-regional distribution grid company MRSK Ural on the topic of “Grid Modernization: Regulation, Organization, and System Security.” No other information was given about programs involving ESCOs.

Transportation

Transportation is seen as a key component of German economic development. To help customers make better decisions regarding vehicles, dena is providing support for ecolabels for cars and tires. The agency is also working to speed the introduction of natural gas and biofuels into the transportation fuel stream.

Enforcement

dena does not have any enforcement responsibilities.

Coordination with other Agencies

Partnerships with other agencies and businesses are vital to dena’s success. Each project may involve its own particular set of partners. dena often coordinates with local, federal, and EU governmental institutions, consumer and environmental agencies, businesses, and trade organizations within Germany and outside its boundaries.

⁴⁶ See <http://www.energieeffiziente-kommune.de/>.



United Kingdom: The Energy Saving Trust (EST)

Overview

The Energy Saving Trust (EST), formed in 1992 after the Rio Earth Summit, is a non-profit organization with a charitable foundation whose purpose is to promoting sustainable use of energy. Although the organization is funded mostly by the British government (including the Department of Energy and Climate Change, the Department for Transport, the Department for Trade and Industry, and the Scottish Executive), it also receives some funding from the private sector.

EST works with governments, local authorities, organizations and businesses to achieve an 80 percent reduction in carbon emissions by 2050.⁴⁷ The Trust also helps people save energy and reduce fuel bills, use water more sustainably, and reduce carbon emissions.

To achieve these goals, EST provides impartial energy-saving advice to households and communities. In the meantime, EST actively promotes carbon emissions reduction in diverse forms. The activities initiated by EST include delivering or managing government programs, testing low-carbon technology, verifying certification and assurance for businesses and consumer goods, and developing models and tools.

EST's staff consists of several experts, each of whom focuses on a different energy/environment area.

Information Collection and Dissemination

EST provides several data services for its customers and partners. These data services include EMBED, which is an online hub for storing and sharing building energy monitoring study data; a funding database to provide information about loans or grants available to local authorities and housing associations; the Homes Energy Efficiency Database (HEED), a national database which tracks the EE characteristics of the UK's housing stock; and Home Analytics that provide essential data and analysis on the UK housing stock to help target retrofit activity.

EST spreads its knowledge and ideas through different ways including releasing publications, providing updates on social media and through email subscriptions. Customers can also seek energy saving information from the EST website, through a telephone advice service, and by applying for on-site expert consultancy. Through 2012, EST had released over 670 publications including its annual reports, pieces on strategy and research, those providing practical and technical guidance, and case studies. The audience of its publications includes consumers, businesses, housing professionals, transport fleets, local authorities, and corporations.

Funding

In 2012, EST's total funding was £58.2 million, of which 49 percent came from the British government's Department of Energy and Climate Change, 3 percent from the Welsh government, 6 percent from the Department of Transport, 34 percent from the Scottish government, and 8 percent from other sources.

Grants and Incentives

As part of its work on spreading the word about energy savings, EST provides information about how to find grants or financial support for individuals, households, communities or organizations. Those resources can come from European funding, government funding, trusts and foundations, local authorities, and so on. In addition, EST works with government on large governmental programs and to provide grants. For example, in 2012–13, EST issued £5.21 million of domestic vouchers for the Renewable Heat Premium Payment Program. In 2012, the total grant payments of EST were £17.3 million.

Training Programs

EST provides training services, mainly for organizations, on topics such as EE improvement, safe and smart driving, green fleet management and capitalizing on the opportunities presented by Green Deal and ECO. EST also offers a number of capacity-building workshops.

47 UK Energy Efficiency Action Plan 2007. Accessed from: http://ec.europa.eu/energy/demand/legislation/doc/neeap/uk_en.pdf



EST also offers a number of certifications related to energy savings. These include:

- Motorvate Certification for organizations based in England and operating a fleet of less than 3.5 tonnes;
- Non-Road Mobile Machinery certification for pollution abatement equipment supplied by local government and construction projects;
- Green Deal Certification for installers of insulation, lighting or glazing, a sole trader or a large corporation;
- Endorse Advice Service to assess the ability of organization staff to deliver energy-saving advice; and
- Green product labeling.

Guidebooks/Tools

EST provides energy saving guides and the application templates for proposed grants for energy saving, as well as many online tools. The online tools allow homeowners to see how their homes, travel and water use contribute to carbon emissions. These tools are an important step on the road to a low-carbon lifestyle, stimulating the appropriate uptake of low-carbon technologies. Examples of the online tools include: the Home Energy Check, the Home Energy Generation Selector, the Cashback Calculator, the Solar Energy Calculator, the Water Energy Calculator, and the Travel Energy Check.

Monitoring and Evaluation⁴⁸

EST undertakes independent testing and evaluation of how low carbon technologies and energy efficient measure perform when installed in real peoples' homes. To date, they have developed more than 20 monitoring projects to evaluate the performance of low-carbon technologies and EE measures. In addition, EST has created models (such as BREDEM, Home Analytics and other evidence-based models) to evaluate the potential impact of energy-saving programs.

Energy Efficiency Programs

Broad-scale programs include:

- Home Energy Scotland: the energy advice centers for the Scottish government, providing energy advices for communities, local authorities, housing associates, landlords and smaller businesses;
- Concerted Action for the Renewable Energy Sources Directive (CARES), supports EU member state implementation of the RE sources device; and
- Concerted Action for the Energy Efficiency Directive (CAEED): supports EU member state implementation of the EE Directive.

EST also works with communities across the UK to help to reduce their carbon footprint and fuel bills through many different programs. They have a specialist community team which works with communities to plan and deliver carbon-saving activities. The programs include:

- The community RHPP project, which offers grants for 50 community groups to buy and install renewable heating systems;
- Ynni'r Fro: a community energy program, funded by the Welsh government, which identifies community-owned RE projects;
- Natural Resources Wales Hydro Program, which helps community groups identify potential sites for the installation of hydro power in Wales;
- Rural Carbon Challenge Fund, which is dedicated to community RE projects in rural north west of England; and
- Resource Efficient Scotland Program, which provides advices on energy, water, materials and waste for Scotland's community and public sectors.

48 "Energy Monitoring." Energy Saving Trust. Accessed from: <http://www.thelia.org.uk/files/docs/energy-monitoring-1350902293.pdf>



Public Sector Programs

EST has a number of activities focusing on the public sector. Examples include:

- Development of Best Practice Guides and advisory support for local authorities
- District heating loan program
- Local Authority and Housing Support program (in Wales)

Residential Sector Programs

Residential EE programs include:

- The Domestic Renewable Heat Premium Payment project, which offers grants for households in the UK for their RE technologies and applications;
- The Energy Saving Advice Service, funded by the Department of Energy and Climate Change (DECC), providing households in England and Wales with advice on how to save energy, cut bills and reduce carbon emissions;
- The Home Energy Scotland Renewables Loan Scheme, which provides interest free loans for installations of renewable electricity and heating technologies;
- The Green Homes Network, an extensive network of households in Scotland willing to show their renewable system to other households considering similar installations;
- The Scottish government's Energy Assistance Package, which helps households in Scotland pay their energy bills;
- NEST, the Welsh government's flagship program to improve the EE of Welsh households through eco-retrofits, weatherization, and the installation of heat pumps;
- The Built Environment Sustainability Training (BEST) program, which develops a long-term educational strategy for Wales, raising skill levels of RE;
- The Northern Ireland Sustainable Energy Program, which provides more than £7 million of support each year for EE and energy savings programs for households and small businesses; and
- Ready for Retrofit, an £8 million program in southwest England that aims to improve the EE of housing stock.

Transportation

EE programs focus on increasing knowledge and awareness of sustainable transport issue in UK while promoting and encouraging carbon emissions reduction in transport. Efforts include the Supply Chain Training program, the Green Fleet Management program, Motorvate, the Smart Driving program, the Plugged-in Fleets Initiative, Green Freight Europe, and the Electric Vehicle Initiative.

Private Sector (including ESCOs):

The Green Home Cashback scheme was launched by the Scottish government to encourage private and social tenants and private sector landlords to install EE measures. EST does not work directly with ESCOs, but provides advising support for consumers interested in working with ESCOs.

Coordination with Other Agencies

EST works closely with government agencies, such as Department of Energy and Climate Change, to offer grants for the RHPP projects, and to provide the energy advice services for households and small business; the Department of Transport for the transportation campaign; the Scottish government, Welsh government to fund the energy advice centers in these areas and to fund their local programs. It also works closely with local authorities, utilities, universities, and foundations to fund some of its programs. Because EST is member of the European Energy network, it works closely with organizations across the EU, and EU partners, to support EU energy policy. In addition, EST works with business around the world, like Genesis Energy, a major electricity and gas supplier in New Zealand, to reduce their customers' energy consumption; manufacturer John Lewis, to provide data on its customers' attitudes towards EE; and other clients such as Radflek, Xtratherm, and Alpha Fry Ltd.



The Korea Energy Management Corporation (KEMCO)

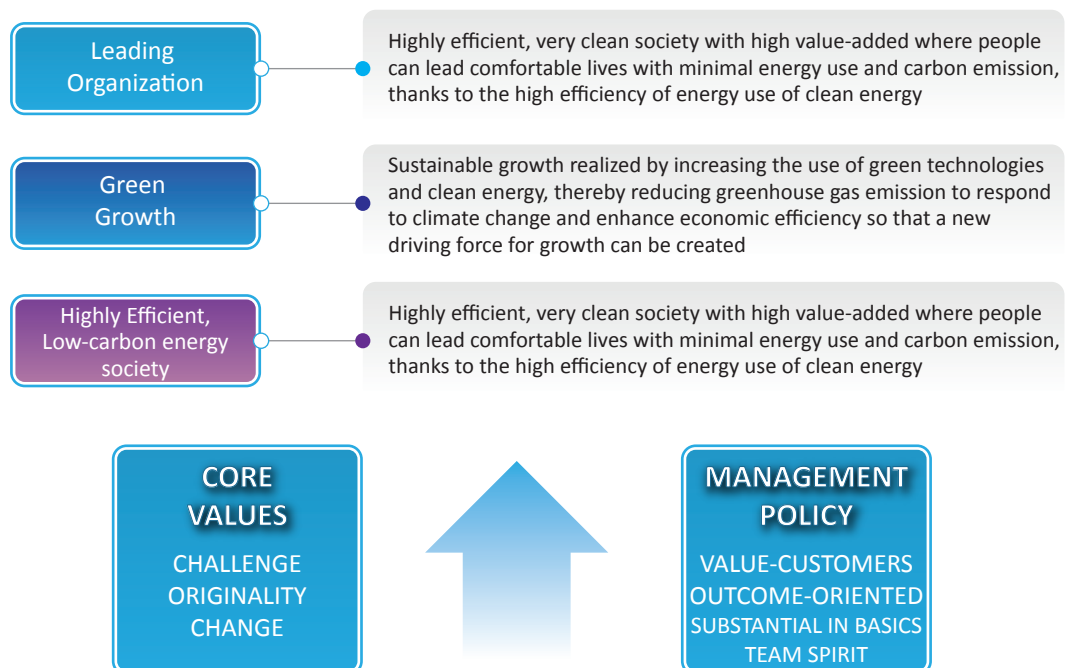
Overview

The Korea Energy Management Corporation (KEMCO) is a public organization responsible for the implementation of energy efficiency, new and renewable deployment, and climate change mitigation policies and measures. It was established in 1980 by the Ministry of Commerce, Industry and Energy under the “Rational Energy Utilization Act.” Its primary function is nationwide energy management by providing services that vary from technical and financial support to administrative services, thereby pursuing an ultimate goal of building an environment-friendly socioeconomic structure. The New and Renewable Energy Center was set up as an affiliate body of KEMCO in 2003. KEMCO was accredited as a Clean Development Mechanism (CDM) Designated Operational Entity (DOE) by the United Nations in 2005 and is one of the top DOEs in the world.

KEMCO operates according to the principle: “An organization leading green growth and creating a low carbon energy society together with the people.”⁴⁹ This principle is illustrated in Figure B-3.

The KEMCO vision (see Figure B-4) is stated as “Creating a Smart & Green Lifestyle: High energy efficiency and Saving.”

Figure B-3: KEMCO Core Values and Management Policy

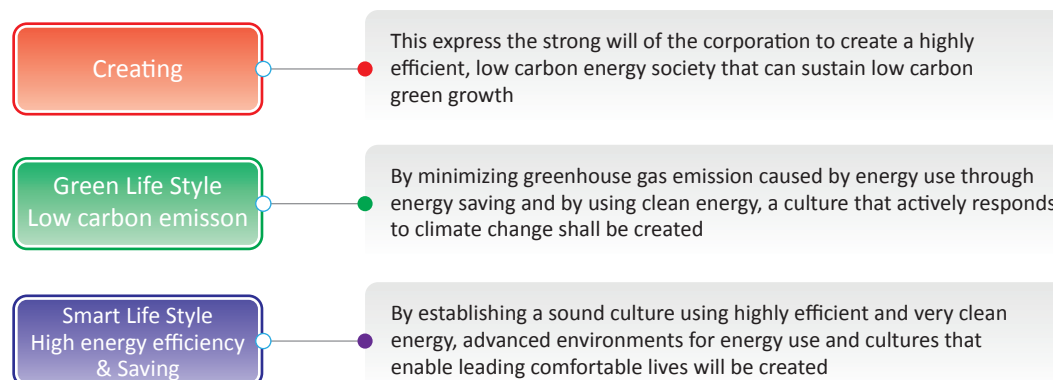


Source: Korea Energy Management Corporation. <http://www.kemco.or.kr>

⁴⁹ KEMCO, Energy Efficiency, Green Technologies, New and Renewable Energy: Kemco Annual Report 2012. Accessed from: http://www.kemco.or.kr/renew_eng/resources/resources_list.aspx



Figure B-4: KEMCO's Vision



Source: Korea Energy Management Corporation. <http://www.kemco.or.kr>

As of the fourth quarter of 2013, KEMCO employed 476 people. Those people are spread across four headquarters offices, 17 departments, 1 affiliate, and 12 regional headquarters. The Corporation is overseen by a Board of Directors. That Board consists of a chairperson (recommended by Directors Recommendation Committee and appointed by the Minister of the Ministry of Trade, Industry, and Energy (MOTIE), an auditor (recommended by Directors Recommendation Committee and appointed by the Minister of MOTIE), four executive directors (appointed by the chairperson), six non-executive directors (appointed by the Minister of the MOTIE), and an executive director (recommended by the chairperson and appointed by the Minister of MOTIE) of the affiliated institution (Renewable Energy Center). There is also a Directors Recommendation Committee consisting of ten independent members.

The organization chart for KEMCO is shown in Figure B-5.

Policy Formulation and Implementation

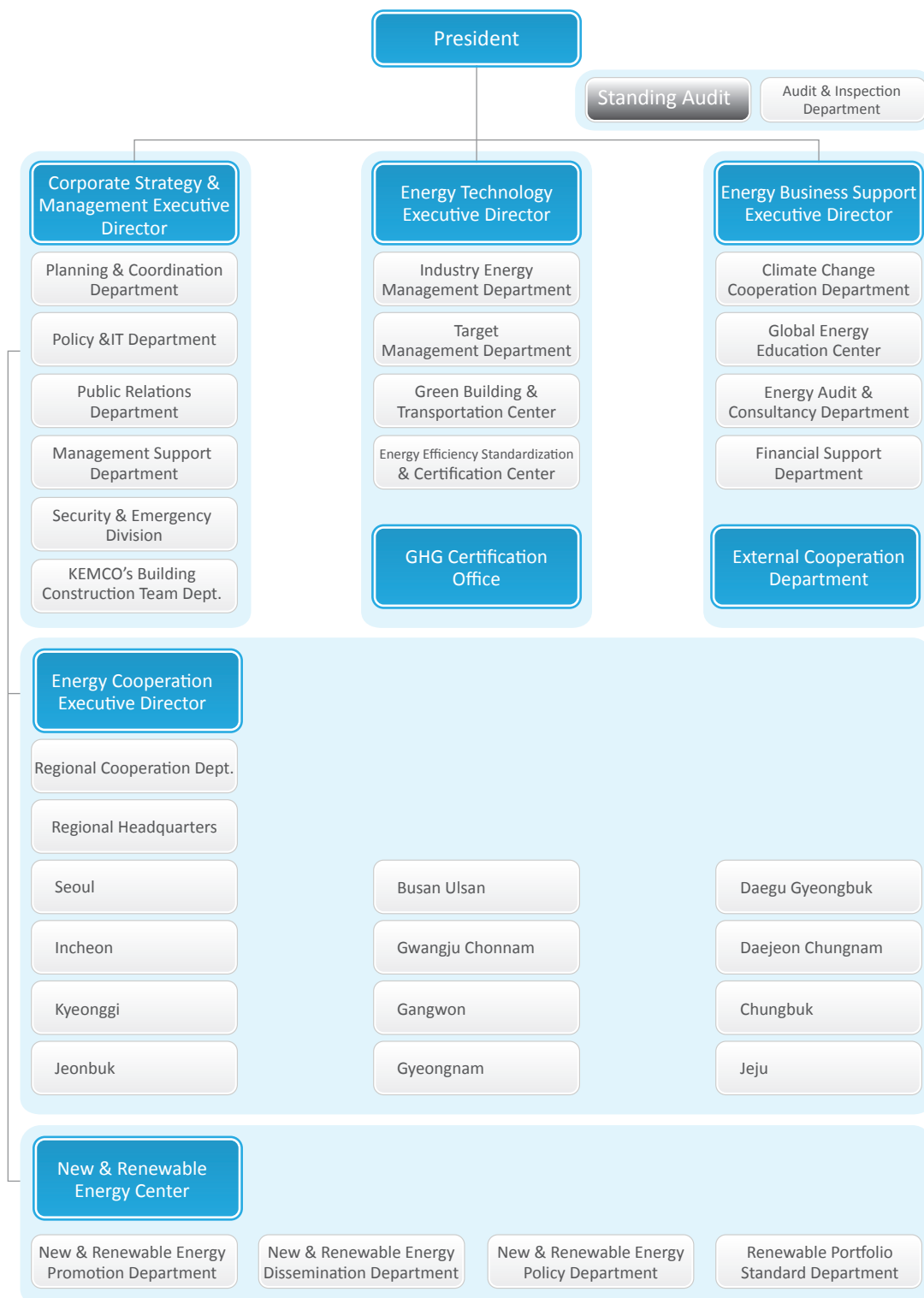
KEMCO develops and promotes RE policies. For example, MOTIE and KEMCO established new criteria for fuel efficiency and GHG emissions.

KEMCO also works with and supports several ministries for energy and GHG-related policies, including GHG & Energy Target Management Systems. KEMCO provides a range of efficiency standards and certification programs, including Energy Efficiency Grade Label, High-efficiency Equipment Label, Fuel Efficiency Rating System, Building Energy Efficiency Certification, and e-Standby program. It oversees the KVER (Korea Voluntary Emission Reduction). In addition, its New and Renewable Energy Center manages RE-related policies, including RPS.

In terms of enforcement of energy policies, KEMCO and the Korean government conduct a joint inspection of the energy consumption of public institutions twice a year. Additionally, in order to obtain a building permit, a property owner must fill out an energy-saving worksheet and submit it to the local government office. The worksheet is reviewed by KEMCO at the request of the permit authority. Finally, KEMCO assists in the administration of energy utility demand side management (DSM), evaluating the report of plans and results of energy utility DSM, and organizing a DSM committee.



Figure B-5: KEMCO Organization Chart



Source: Korea Energy Management Corporation. <http://www.kemco.or.kr>



Information Collection and Dissemination

KEMCO collects energy and GHG emissions data from energy intensive organizations and operates the National GHG Emission Total Information portal. From energy-intensive businesses it collects the quantity of energy consumed and products manufactured, the estimated quantity of energy to be consumed and products to be manufactured, the current status of energy-using machinery, equipment or materials, outcomes of the rationalization of energy use and plans for the rationalization of energy use.

KEMCO operates several websites to share key energy data and information on energy saving measures and energy efficient products among experts. These include its Information Sharing Center, the online and offline Energy & Climate Information Center, the Climate Insight Knowledge Portal, Efficiency Ocean, the Save Energy Save Earth site, and New and Renewable Energy Korea. KEMCO also promotes energy saving and GHG emissions reduction through the mass media, the publication of policy briefs, best practices papers, annual statistics and annual reports. It also established several exhibition centers which features various exhibits, such as high efficient energy products, green home models, and miniatures of RE systems.

Funding

KEMCO received ₩69,151 million (about US\$65.4 million) in 2013 from government funds and business revenues.

Grants and Incentives

KEMCO manages and monitors the Korean government's Rational Energy Utilization Fund, which provides long-term and low-interest rate loans along with tax incentives for energy efficiency and conservation investments. KEMCO also offers rebate and incentive programs for high-efficiency products.

Training Programs

KEMCO operates an education center (Global Energy Education Center) which provides a range of education and training courses related to energy and climate change. The Corporation also provides consulting services on energy management systems, and provides an online GHG Emission Trading System for organizations who intend to participate in trading voluntarily.

Monitoring and Evaluation

KEMCO plays a role as the evaluation committee for the consultation on the Energy Use Plan, a mandatory requirement for those who plan to start energy intensive organizations.

In addition, through its work for the CDM program, KEMCO has become involved in extensive monitoring and evaluation efforts, including measurement and verification of GHG emission reductions under the Korea Voluntary Emission Reduction program.

Public Sector Programs

KEMCO has developed guidelines for rational energy use in public institutions. Also, KEMCO and the Korean government conduct a joint inspection of the energy consumption of public institutions twice each year.

Residential Sector Programs

KEMCO conducts the Performance Evaluation of Eco-Friendly Houses, which is a mandatory regulation for the construction of eco-friendly houses. It also operates the Green Home program, which supports households financially and technically to install RE technologies in their houses.



Private Sector (including ESCOs)

KEMCO's original target customers were SMEs, for which it offers audits (some are free to the customer) and a range of financing programs to assist the industrial client in implementing EE and onsite generation (like CHP) strategies. It has applied this same model to the commercial sector to help owners of commercial buildings and the services industry learn about cost-effective EE and onsite generation (like CHP) options, with financing assistance when appropriate. It also assists this sector with registration for GHG Certificates. Large and commercial sector clients can receive audit services but must pay a fee for them.

KEMCO engages the private sector through training programs, auditing, consulting services, and partnerships. It promotes ESCOs and supports the government and ESCOs by operating Energy Conservation Fund and by providing policy recommendations.

Coordination with Other Agencies

In the conduct of its mission, KEMCO works with a range of domestic organizations, including central government agencies, ministries, local governments, companies, education institutions, and NGOs. It also works with the World Bank, IFC, and governments in developing countries to help developing countries build capacity and sustainability.

