T.C. MINISTRY of ENERGY and NATURAL RESOURCES General Directorate of Renewable Energy (GDRE)

RECENT ENERGY EFFICIENCY POLICIES AND IMPLEMENTATIONS IN TURKEY

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Context

A. Energy Sector in Turkey
B. Energy Efficiency Law
C. Main Policies and Implementations
D. Future Plan
A. Energy Sector in Turkey

- Economic growth: 8.9% - in 2010
- Dependency on energy import: 74% - in 2009
- The annual increase in energy demand: 5.0% - after 1990 (in EU: 1.6%)
- Expected annual increase in primary energy demand: 4%
- The annual increase in electricity demand until 2020: 6.7% or 7.5% (scenario 1) (scenario 2)
- Investment needs within the next 15 years: 130 bilion $
A. Energy Sector in Turkey

Primary Energy Intensity in Turkey
B. Energy Efficiency Law

Fundamental Transformation: 2007

“Energy Efficiency Law” put in to force at 2007 and it’s secondary legislation has been amended in 2011.

Vision of the Law

• to make Turkey a country having high energy consumption per capita and low energy intensity
• to get maximum benefit from energy
C. Main Policies and Implementations

- Energy efficiency service sector (ESCO’s)
- Energy Management
- Training and Awareness
- Supports
- Measuring and monitoring
- Energy performance of buildings (Energy Identity Certificate)
- Energy-efficient product market
- On-site generation, on-site consumption (cogeneration, renewables etc.)
C. Main Policies and Implementations

Authorizations for energy efficiency services

• Authorizations of Agencies
  – Gazi University
  – Chamber of the Mechanical Engineer,
  – Chamber of the Electrical Engineer

• Authorizations of EE Consultant Company (ESCOs)
  – 38 EE Consultant Company (ESCOs) have been authorized.
    • Industry – 23
    • Building - 30
C. Main Policies and Implementations

Energy Management

- Energy Policy
- Energy Planning
- Training & Awareness
- Measuring & Monitoring
- Energy Audit
- Reporting
- Preparation of alternative plans to reduce use of oil and natural gas
- Investigation of possibilities for the use of alternative fuels
- Determination of the amount of CO$_2$ emission can be reduced through energy efficiency measures

in accordance with ISO 50001 Energy Management Systems - Application Requirements Standard
C. Main Policies and Implementations

Appointment of energy manager and establishment of energy management unit

<table>
<thead>
<tr>
<th>Sector</th>
<th>Energy Manager</th>
<th>Energy Management Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>≥ 1,000 TOE</td>
<td>≥ 50,000 TOE</td>
</tr>
<tr>
<td>Power Plants</td>
<td>minimum 100 MW installed capacity</td>
<td>-</td>
</tr>
<tr>
<td>Organized Industrial Zone</td>
<td>-</td>
<td>at least 50 industrial enterprises</td>
</tr>
<tr>
<td>Public Buildings</td>
<td>≥ 10,000 m²</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>≥ 250 TOE</td>
<td></td>
</tr>
<tr>
<td>Commercial and Service Buildings</td>
<td>≥ 20,000 m²</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>≥ 500 TOE</td>
<td></td>
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</tbody>
</table>
C. Main Policies and Implementations

Energy Manager Training

(Energy Efficiency Training Center - established in October, 2001)

- Fan and Pump
- Compressed Air
- Lighting
- Companzation
- Cooling

- Combustion Furnace
- Open Burners
- Steam Boiler
- Steam Traps
C. Main Policies and Implementations
Incentives for industrial establishments
by GDRE - 1

Efficiency Improvement Projects

- Maximum Payback Period: 5 years
- Maximum project cost: 1.000.000 TL (~400.000 Euro)
- Maximum support: up to 30 % of project cost
- Sertificate: TS EN ISO 50001 (After 2014)

in 2009:
- 56 industrial plants have been applied with 72 EE Projects
- 17 Projects have been supporting of 12 industrial establishments

in 2010:
- 24 industrial plants have been applied with 27 EE Projects
- 15 Projects have been supporting of 13 industrial establishments
C. Main Policies and Implementations

Incentives for industrial establishments by GDRE - 2

Voluntary Agreement

- Agreement reducing energy intensity 10% on average in 3 years
- Maximum support 20% of the energy costs not to exceed 200,000 TL (~80,000 Euro)
- Sertificate TS EN ISO 50001 (After 2014)

in 2009:
  - 24 industrial plants have been applied.
  - 11 industrial establishments made voluntary agreement.

in 2010:
  - 11 industrial plants have been applied.
  - 11 industrial establishments made voluntary agreement.
C. Main Policies and Implementations

**Incentives for the SME’s by KOSGEB**
(Small and Medium Enterprises Development Organization)

- Energy Manager Training up to 3,000 TL (~ 1,200 Euro)
- Pre-Audit up to 2,000 TL (~ 800 Euro)
- Energy Audit up to 20,000 TL (~ 8,000 Euro)
- Consulting services for efficiency improvement project up to 5,000 TL (~ 2,000 Euro)
C. Main Policies and Implementations

Incentives for industry by TTGV - 1
(Technology Development Foundation of Turkey)

Technology Development (R&D) Projects

- Project Period: Maximum 2 years
- Maximum support: 1 Million US$, %50 of project budget
- Repayment Period: 1 year grace period of 4 years (Interest-free)
- Source: Undersecretariat of Foreign Trade

- ~ 104 R&D Projects (EE + RE)
- ~ 35 Million $
C. Main Policies and Implementations

Incentives for industry by TTGV - 2
(Technology Development Foundation of Turkey)

Environment Supports

a) Energy Efficiency Supports

b) Environmental Technology (Clean Production) Supports

c) Renewable Energy Supports

- Project Period: Maximum 2 years
- Maximum support: 1 Million US$, %50 of project budget
- Repayment Period: 1 year grace period of 4 years (Interest-free)
- ~ 76.5 million kWh/year energy saving
- ~ 25.5 million kWh/year electricity production
- ~ 41.385 ton/year CO₂ saving
C. Main Policies and Implementations

Supports of Undersecretariat of Treasury

Energy Efficiency Projects

- customs tax exemption
- VAT exemptions

Cogeneration

- Minimum annual average efficiency % 80
C. Main Policies and Implementations

Supports of Development Bank of Turkey

Financing of Energy Efficiency

- **Type of investment**: Minimum 20% energy saving or at least 50% of economic gain created by energy efficiency in energy consumption

- **Type of support**: Long-term (2-5 years including a grace period of 10-15 years) and low-interest loans

- **Source**: World Bank
  IBRD - International Bank for Reconstruction and Development
  EIB - The European Investment Bank
  AFD - French Development Agency
  CEB - Council of Europe Development Bank
  IDB - Islamic Development Bank
C. Main Policies and Implementations

Supports of Industrial Development Bank of Turkey

Financing of Energy Efficiency

- Type of investments: Process improvement, modernization or production capacity expansion investments in energy efficiency of Private sector with minimum 20% energy saving or at least 50% of economic gain created by energy efficiency in energy consumption and 20% CO₂ saving

- Type of support: Long-term loans

- Source:
  - IBRD - International Bank for Reconstruction and Development
  - EIB - The European Investment Bank
  - AFD - French Development Agency
  - KfW - German Development Bank
  - CEB - Council of Europe Development Bank
  - IDB - Islamic Development Bank
C. Main Policies and Implementations

“Energy Identity Certificate” for Buildings

Information about the Building

Energy Performance of the Building kWh/m²/year

GHG emission classification kgCO₂/m³/year

Ratio of Renewables usage %

Consumption for Heating

Consumption for Hot Water

Consumption for Cooling

Consumption for Lighting

Consumption for Ventilation

Building Photo

Energy Performance Chart

GHG Emission Classification

Ratio of Renewables Usage

Consumption Charts

Building Information

Energy Performance Table

GHG Emission Chart

Ratio of Renewables Table

Consumption Statistics

Building Identification

Energy Performance Rating

GHG Emission Rating

Ratio of Renewables

Consumption Breakdown

Building Details

Energy Performance Chart

GHG Emission Classification

Ratio of Renewables Usage

Consumption Statistics

Building Identification

Energy Performance Rating

GHG Emission Rating

Ratio of Renewables

Consumption Breakdown

Building Details
C. Main Policies and Implementations

Awareness

- Energy Efficiency Week
  (9-15 January, 2012)
C. Main Policies and Implementations

Awareness

- Energy Efficiency Contests
  - Project competition on Increasing Energy Efficiency In Industry
  - Picture and Story Competition Between Primary School Students
  - Project Competition Among High School Students
D. Future Plan

Main Target
Reduction of energy intensity of Turkey 20% by 2023

  (Official Gazette: 25th February, 2012; no 28215)
  - to ensure unity of vision and action between institutions and organizations
  - to improve co-operation by strengthening the understanding of social responsibility
  - to ensure compliance between energy efficiency studies and environmental issues
  - to develop measurable, traceable and applicable measures and implement them in a participatory approach
  - Provide more resources to energy efficiency
D. Future Plan

Targets of Strategy Paper

- To reduce energy intensity and energy losses in industry and services sector,
- to promote sustainable and eco-friendly buildings in order to reduce energy demand and carbon emissions of buildings
- to ensure market transformation of energy-efficient products
- to improve efficiency on electricity generation, transmission and distribution and to reduce energy losses and emissions
- Transport:
  - ✓ to reduce unit fossil fuel consumption of motor vehicles
  - ✓ to increase share of railways on freight and passenger transport
  - ✓ to increase share of public transport in cities,
  - ✓ to prevent unnecessary fuel consumption on urban transport
  - ✓ to reduce emissions
- Effective and efficient use of energy in public organizations
- To strengthen institutional structures, capacities and cooperation's
- to increase the use of advanced technology and awareness-raising activities
THANK YOU FOR YOUR ATTENTION