

Overview on Renewable Energy and Energy Efficiency in Turkey

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Context

- Overview of renewable energy in Turkey
 - ✓ Potentials
 - ✓ Targets
 - ✓ Investments
 - ✓ Incentives
- Overview of energy efficiency in Turkey
 - ✓ Potential
 - ✓ Target
 - ✓ Legislative Framework
 - ✓ Implementation
 - ✓ Future Plans
- Conclusion



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Renewable Energy

Turkey has substantial amount of renewable energy potential and the utilization rates are growing. Hydro, wind and solar energy resources are the major portions of renewable portfolio.

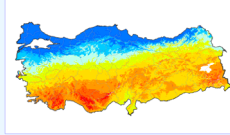
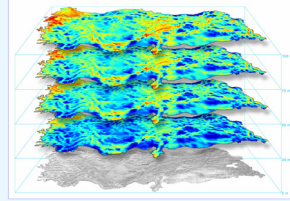
Renewable Potentials

Hydro (economic) : 160,000 GWh/a.

Hydro (technical pumped) : 7,300 MW,

Wind : 48,000 MW

Solar : 380,000 GWh/a. (equivalent to the annual production of 56,000 MW natural gas power plant) solar electricity potential.



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Turkey gives significant importance to encourage the energy production using renewables in a cost effective manner. Renewable targets defined by Energy Strategy Paper as follows:

- 30% of total electricity production from renewable energy until 2023,
- The whole economically usable hydropower potential of Turkey will be provided for generating electrical energy until 2023,
- 600 MW geothermal energy will be implemented by 2023,
- 20,000 MW wind energy will be in operation in 2023.



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Developing of legislative infrastructure in Turkey since 2005 for renewable caused positive acceleration to the renewable energy investments in Turkey.

- Installed wind power capacity of 18 MW at 2003 increased to 1,300 MW today.
- Hydro power installed capacity exceeded 14,500 MW.
- A total capacity of 600 MW solar power plants will be developed by the end of 2013 by private sector. Licensing procedure has already been started for power generation by solar.



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Amendment on Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity

10-year guaranteed price has been given for renewable energy sources as follows:

- Hydroelectric and wind power :7.3 US cents/kWh
- Geothermal power :10.5 US cents/kWh
- Biomass power (including landfill gas) :13.3 US cents/kWh
- Solar power :13.3 US cents/kWh



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In the case of the RES licensed corporate bodies, which will be in operation before December 31, 2015, produce the mechanical and/or electro-mechanical parts in the country; additional price will be added to the guaranteed price from the start of operation date of the plant.

Council of Ministers will determine the price and periods for renewable based power plants after December 31, 2015.

Legislative infrastructure has been also improved to renewable based electricity facilities developed by the real persons and legal entities up to 500 kW installed capacity is free of license



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Energy Efficiency

Fundamental Transformation: Legislation & National Movement

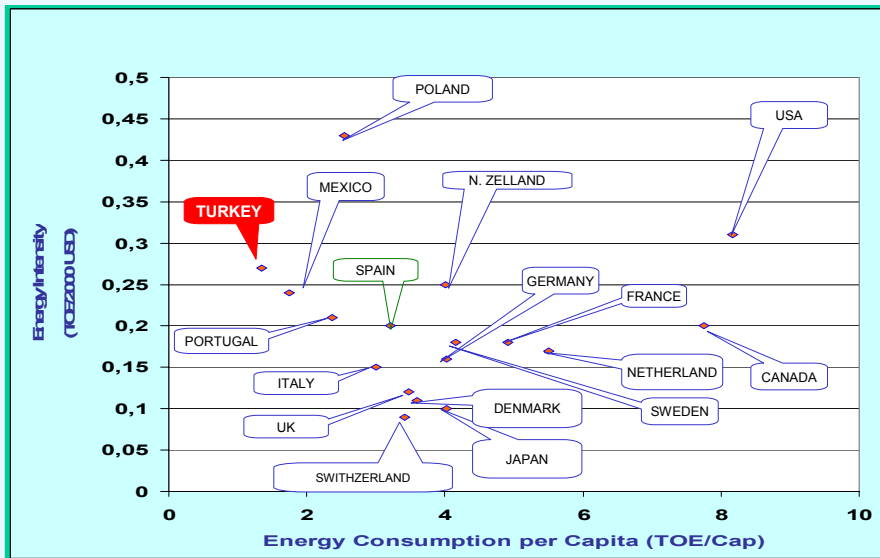
- Law on EE and it's secondary legislation put in to force at 2007 and 2008.
- National EE Movement has been initiated by prime minister in 2008.

Our Vision

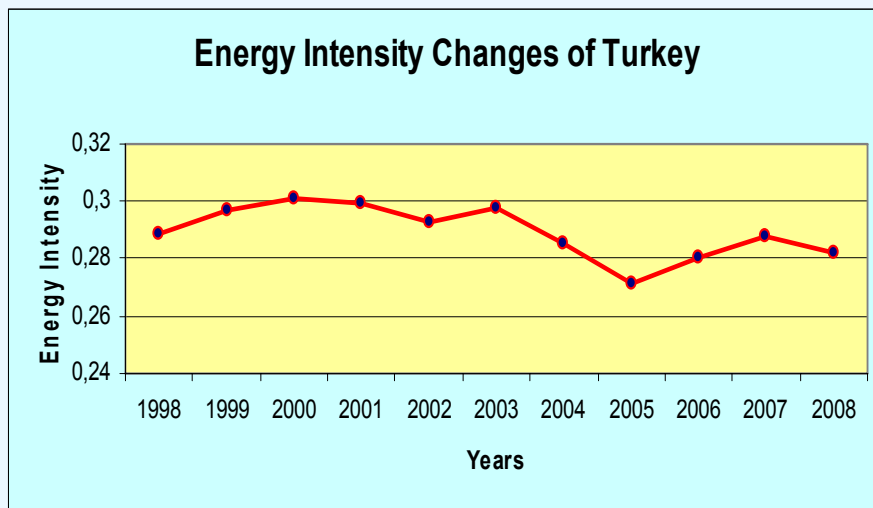
- to make Turkey a country having low energy intensity and high energy consumption per capita
- to get maximum benefit from energy



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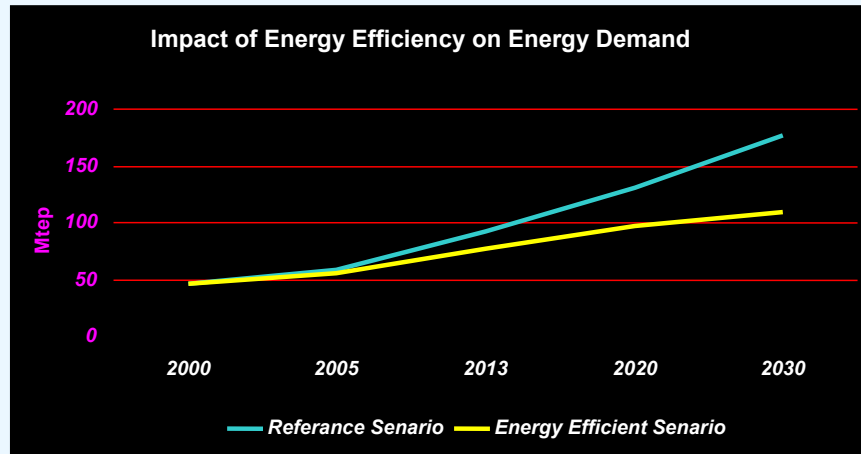


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Energy Saving Potential



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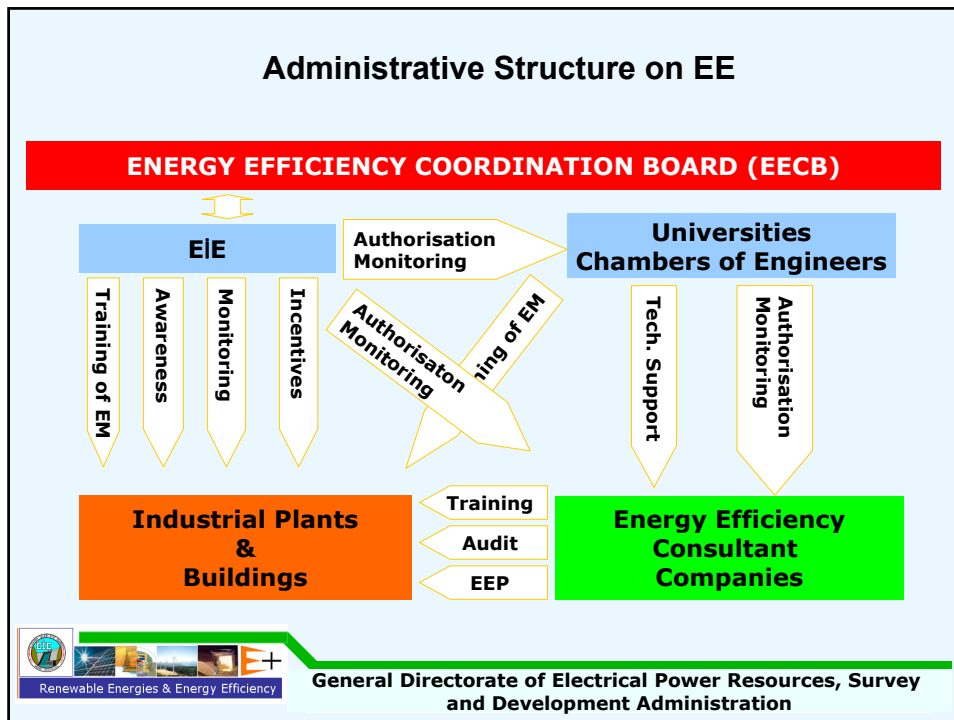
Main Measures on EE by Legislation

- Administration & Institution
- Energy Management
- Training & Certification
- Incentives & Supports
- Monitoring
- Awareness
- Energy Performance for Buildings
- Minimum Energy Efficiency Requirements
- Renewable Energy
- Cogeneration



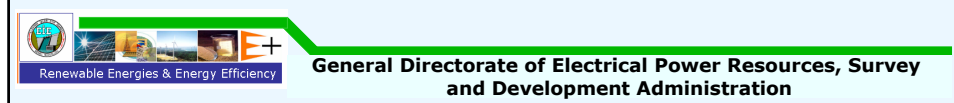
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Administrative Structure on EE



Authorised universities, chamber of professions and EVD companies for EE services such as training for certification, energy audits, and/or consultancy.

- Gazi University (B Class license)
- Chamber of Mechanical Engineers (A Class license)
- Chamber of Electrical Engineers (B Class license)
- 38 licensed Energy Efficiency Consultancy (EVD) Companies
 - ✓ 30 licensed EVD for building and service sectors
 - ✓ 23 licensed EVD for industry sector



Energy Management

| | Energy Manager | Energy Management Unit |
|----------------------------------|--|------------------------|
| Industry | ≥ 1.000 TOE | ≥ 50.000 TOE |
| Public Buildings | ≥ 10.000 m ² or ≥ 250 TOE | |
| Commercial and Service Buildings | ≥ 20.000 m ² or ≥ 500 TOE | |

- The number of certified energy managers are over 3,900
- More than 500 industrial plants and 500 buildings have been appointed energy managers in their facilities.
- EN 16001 Energy Management Standard has been issued by Turkish Standard Institute in 2010 and as of July 2010 certification has been started.



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Training & Certification



Combustion Furnace
Training Unit



Boiler
Training Unit



Steam Trap
Training Unit



Pumping
Training Unit



Lighting
Training Unit



Fan
Training Unit



- Combustion Furnace
- Open Burners
- Steam Boiler
- Steam Traps
- Fan and Pump
- Compressed Air
- Lighting
- Companzation
- Cooling

Incentives & Supports

- Energy efficiency projects for industry
 - ✓ 32 of energy efficiency projects to improve EE at existing plant for 25 industrial plants
- Voluntary agreements for industry
 - ✓ 22 voluntary agreements with 22 industrial establishments so as to reduce their energy intensity.
- Energy efficiency services for SME's
- Co-generation
- Renewable



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Monitoring

Industrial plants and buildings which should build up energy management system in their facilities are monitored by government.

Awareness

- National EE Movement
 - ✓ Action plans by provinces
 - ✓ Joint actions and cooperation
 - ✓ Contests, seminars, symposium, conferences etc. Energy
- Energy Efficiency Week (Second Week of January)
 - ✓ 3. National EE Forum January 12-13, 2012 in İstanbul



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Energy Performance Performance of buildings

The “Regulation on Energy Performance in Building”, which is published in Official Gazette of 27075 on December 5, 2008, enforced by December 5, 2009 will have required to meet the minimum performance criteria and standards concerning architecture, heat insulation, heating and cooling systems and electrification and amended by April 2010.

Energy Performance Certificate is compulsory for new building since January 2011.



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Regulation on Eco-Design Requirements for Energy Related Products was published in Official Gazette on 7 October 2010

Technical studies have been conducting to define minimum EE requirements for product bases.



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International Cooperation

- Project on Market Transformation of Household Appliances (GEF-UNDP) (2010-2014)
- Project on Promoting Energy Efficiency in Building (GEF-UNDP) (2011-2015)
- Project on Improving Energy Efficiency in Industry (GEF-UNDP-UNIDO) (2011-2016)
- Project on Supporting of EIE on establishment of monitoring tools (The Netherland) (2011-2013)



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Future Plan on Energy Efficiency

Energy Efficiency Strategy Paper (Draft)

To give impulse to energy efficiency activities via close cooperation between public, private and civil sectors; Energy Efficiency Strategy Paper has been drafted to get future planning as a road map and relevant targets with the consensus of all stakeholders.



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Overall Target is to reduce energy intensity of Turkey %20 by 2023.

- by reducing energy intensity and energy losses in the industry and services sectors,
- by decreasing energy demand and carbon emissions of the buildings having low energy efficiency and to promote sustainable and environment friendly buildings using renewable energy sources,
- by providing market transformation of energy efficient products,
- by increasing efficiency in power generation, transmission and distribution of electricity; to decrease energy losses and harmful environment emissions,
- by reducing fossil fuel consumption of motorized vehicles, to increase share of public transportation in highway, sea road and railroad and to prevent unnecessary fuel consumption in urban transportation,
- by increasing energy efficiency in public sector,
- by strengthening of institutional capacities and collaborations; to increase use of state of the art technology and awareness activities and to develop sustainable financing mechanisms.



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Some Important Actions in Future

- Strengthening of institutional capacities
- Strengthening of national and international cooperation
- Expanding of scope of incentives and supports
- Development of sustainable financial mechanisms
- Rehabilitation of existing buildings (Improving heat insulation)
- Introducing and promoting of eco buildings
- Promoting of investment for small scale renewable
- More comprehensive campaign to raise public awareness



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Conclusion

- High energy saving and renewable energy source potentials.
- Attractive opportunities for the foreign investors for local cooperations.
- Government side open for any kind of cooperations



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THANK YOU

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