

Current Studies and State of Play in Turkey regarding Low Carbon Technologies



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At a Glance

General Directorate of Renewable Energy

- Renewable energy sources
- Energy efficiency
- Carbon market
- Renewable energy certificate system
- New technologies









GHGs Emissions with respect to Sectors (2011)



Source: http://www.csb.gov.tr/projeler/iklim/index.php?Sayfa=sayfa&Tur=webmenu&Id=12463



Carbon Market in Turkey

• Turkey become a party to UNFCCC in 2004 and to Kyoto Protocol as Annex-1 country on August 2009.

• Second Obligation Period of Kyoto Protocol has been started with Doha COP 18 (2013-2020). These special circumstances of Turkey continue for this period.



Voluntary Carbon Markets

- Although Turkey cannot take advantage of flexibility mechanisms determined in Kyoto Protocol, projects at voluntary carbon market established within the scope of environmental and social responsibility has been advanced and applied since 2005.
- Even though voluntary carbon markets represent a small percentage of the global carbon market, it is already effectively used in Turkey.



Numbers and types of projects and annual greenhouse gas emission reduction of them are given below.

Project Type	Numbers	Annual Carbon Emission Reduction (tCO ₂ /year)
Hydroelectric power plant	159	8.747.634
Wind power	106	7.951.391
Energy generation from waste/biogas	27	3.069.273
Energy efficiency	10	432.081
Geothermal	6	405.309
Total	308	20.605.688

http://www.csb.gov.tr/projeler/iklim/index.php?Sayfa=sayfa&Tur=webmenu&Id=12461



Sectoral Distribution of Projects on Voluntary Carbon Market in Turkey with respect to Reduction of Annual Emission Amount, 2014





PROJECT NAME

 Assessment of CO₂ Storage Potential in Turkey, Modeling and a Prefeasibility Study for Injection into an Oil Field

• The Scientific and Technological Research Council of Turkey (TÜBİTAK) Public Research Grant Group (KAMAG), 2009-2011



CONTRIBUTING INSTITUTIONS

- Middle East Technical University Petroleum Research Center
- Turkish Petroleum Corporation
- Ministry of Energy and Natural Resources



PROJECT COMPONENTS

- Providing annual fuel amount and fuel type of thermal power plants and industries,
- Calculation on CO₂ emission,
- Investigation of potential storage site,
- Modeling of injection and storage of CO₂ at selected site,
- Conducting economic feasibility study on storage of CO₂ at the selected site,
- Organizing technical visits.



Location of industrial and power plants used in the estimation of CO₂ emissions





CO₂ emissions from selected sites:





OUTCOMES

- Small petroleum and gas reservoirs can be utilized to conserve CO_2 emissions of small industrial zones.
- CO_2 transportation with tanker is more feasible.
- Dodan, a natural large CO₂ reservoir with 7 billion Sm³ of volume can be considered for storage.
- Possibility of storage in deep saline aquifers should be evaluated. A possible pilot project can be useful for the parties to examine suitability of the case.

DETERMINATIONS

- Establishment of carbon market
- Applying incentives



Project Name: Production of liquid fuel from biomass and coal blend – TRIJEN

In this project; from coal and biomass mixture,

- Generation of liquid fuel with clean and eco-friendly technology
- > Improving high efficient technologies for central stations
- ➤ Demonstration of the results on the pilot scale are aimed.

Supporting Organization	: TUBITAK 1007
Project Start	: 15th June 2009
Project Finish	: 15th June 2015



Project Scope:

- Production of liquid fuel
- Electricity generation,
- Providing heat generation/recovery,
- Capturing CO₂



Lab Scale 150 kWth CFB Gasifier (established)



Pilot Scale 1.1 MWth CBTL Plant (under construction)





Energy Technologies and R&D

• In order to use the technology and solutions developed via R&D projects in the field of energy production by renewable resources and to reduce the dependence in this issue, R&D projects will be carried out in the next 10 years in the context of the protocol signed on 13 August 2012 by the Ministry of Science Industry and Technology (MSIT), Ministry of Energy and Natural Resources (MENR) and The Scientific and Technological Research Council of Turkey (TÜBİTAK).





Ongoing Projects

Project Name: Improvement of National Wind Energy Systems and Production of Turbine Prototype (MILRES)

TÜBİTAK 1007

The main aim of the project is to constitute required background for establishment of individual and competitive wind industry at world standards whose technology belongs to Turkey.



Latest Status: First stage will be completed soon.



MILRES PROJECT















Ongoing Projects

Project Name: Developing of National Solar Power Plant – MILGES

Production of national photovoltaic (PV) cells and modules , designing and producing of national PV inverter, designing of monitoring and control systems (SCADA) and 1 MW and 10 MW two power plants installation.



TÜBİTAK 1007



Ongoing Projects

>Project Name: Developing of LED and OLED Production Technologies

- LED lamp prototype
- LED chip prototype
- OLED panel for aiming of lighting
- OLED screen technologies design and production with places





Other Projects:

- MİLTES Developing of National Thermal Power Plant Technologies
- MİLKAS Developing of National Desulphurization System
- MİLHES Developing of National Hydraulic Power Plant Systems
- National Gas Turbine Blades Production
- Developing of New Generation HVDC Back-to-Back Systems



THANK YOU!

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