Renewable Energy Turkey

Opportunity?

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Prepared by Derya Kaplan, economic and commercial officer
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Executive Summary and Conclusions

Due to the current development in the renewable energy sector and the investor-friendly possibilities such as the feed-in tariffs in the different sub-sectors of the renewable energy, might be interesting for the Dutch companies, industries and other interested that deal with renewable energy.

As the 17th largest economy in the world and 6th largest in Europe, Turkey is experiencing an increase in its energy demand. Turkey has become one of the fastest growing energy markets among the OECD countries in the world, in parallel to its economic growth registered over the last ten years.

Turkey’s energy policies and strategies are based on energy supply security, alternative energy resources, diversity of energy resources, utilization of domestic energy resources to create additional value to economy, liberalization of energy markets, and energy efficiency. Due to this perspective, special emphasis has been made to maximum utilization of local and renewable energy resources as highest priority.

The rapid pace of urbanization, the positive demographic trends, the economic expansion and rising per capita income are the main drivers of the energy demand. The energy demand is estimated to increase around 4 - 6 percent per annum until 2023. The Turkish government has made it a priority to increase the share of renewable sources in the country’s total installed power to 30 percent by 2023.

With the Feed-in Tariff Mechanism, the Unlicensed Generation and the Local Content Support, Turkey tries to attract investors to Turkey in order to increase its renewable energy resources.

According to the Ministry of Energy and Natural Recourses, the total amount of investments required to meet the energy demand in Turkey by 2023 is estimated to be around USD 110 billion, more than double the total amount invested in the last decade.
1. Introduction

1.1. Energy and Renewables

The purpose of this document is to inform and alert the Dutch companies, industries and other interested that deal with renewable energy on the current development and opportunities in the Turkish renewable energy sector.

As the 17th largest economy in the world and 6th largest in Europe, Turkey is experiencing an increase in its energy demand. Turkey has become one of the fastest growing energy markets among the OECD countries in the world, in parallel to its economic growth registered over the last ten years. Also, Turkey has been second largest economy on demand for electricity and natural gas after China. Projections performed by Ministry of Energy and Natural Resources confirm that this situation will continue to be valid for medium and long term.

Turkey’s energy policies and strategies are based on energy supply security, alternative energy resources, diversity of energy resources, utilization of domestic energy resources to create additional value to economy, liberalization of energy markets, and energy efficiency. Due to this perspective, special emphasis has been made to maximum utilization of local and renewable energy resources as highest priority.

The rapid pace of urbanization, the positive demographic trends, the economic expansion and rising per capita income are the main drivers of the energy demand. The energy demand is estimated to increase around 4 - 6 percent per annum until 2023.

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Renewable energy has been one of the important topics on Turkey’s energy agenda. The Turkish government has made the last decade significant energy reforms. The significant progress that has been made in the field of renewable energy started after the enactment of the Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy (Renewable Energy Law, REL) in 2005. After 2005, the Turkish government kept producing, updating and implementing several laws and regulations. Due to this, Turkey’s energy sector turned it into one of the most attractive investment destinations in the world. In line with the implementation of investor-friendly regulations and the high increase in demand, the Turkish energy sector is becoming more vibrant and attracts the attention of more investors for each component of the value chain in all the energy sub-sectors.

According to the Ministry of Energy and Natural Resources, the total amount of investments required to meet the energy demand in Turkey by 2023 is estimated to be around USD 110 billion, more than double the total amount invested in the last decade.

Turkey’s ambitious vision for 2023, envisages especially interesting targets for the renewable part of the energy sector. These targets include:

- 34,000 MW capacity of hydro power plants;
- 20,000 MW capacity of wind power plants;
- Minimum 5000 MW of solar power plants;
- Minimum 1000 MWe geothermal energy; and
- 1000 MWe installed capacity for Biomass energy.
1.2. The developments and current situation

On May 2009, the Electricity Energy Market and Supply Security Strategy Paper was prepared and executed. Turkey’s primary target was even then to increase share of renewable energy resources for electricity generation at least to 30 percent by year 2023.

After that, Turkey launched a Strategic Plan 2010-2014 for the energy sector, where the Ministry has set 11 strategic goals and 32 strategic objectives under 5 strategic themes and created performance indicators regarding these goals and objectives and performed monitoring and evaluation activities.

And on the 9th of February of this year, the Turkish government announced the National Renewable Energy Plan, which has characteristics of a roadmap plan for a strict planning and efficient development of renewable energy until year 2023. The National Renewable Energy Plan was prepared in accordance with 2009/28/EC European Parliament Directive Dated 23 April 2009 and has a focus on supporting energy generation and consumption exploding renewable energy resources. The National Renewable Energy Plan is open to public and an international document which describes Turkey’s planned development and essential measures taken to sustain planned development in a transparent way.

1.3. Where stands Turkey now?

As of end of August 2015, Turkey has 71,858 MW electricity generations installed capacity. 23,643 MW of total installed capacity consists of generating facilities utilizing hydraulic resources, 4053 MW of total installed capacity consists of generating facilities utilizing wind energy resources, 524 MW of total installed capacity consists of generating facilities utilizing geothermal energy resources, 317 MW of total installed capacity consists of generating facilities utilizing biomass energy resources and waste heat, and 155 MW of total installed capacity consists of generating facilities utilizing solar energy resources. As end of January 2015, generating facilities utilizing renewable energy resources constitutes 41% of total installed capacity. As end of year 2013, electricity consumption is approximately 246.356 GWh and approximately 28% of this consumption is fulfilled by renewable energy resources. Approximate contribution of renewable energy resources group is 68,980 GWh which is formed by 86% hydraulic resources (59,420 GWh), 11% wind resources (7,557 GWh), 2% geothermal resources (1,363 GWh) and rest is biomass resources (1,171 GWh)

1.4. Target 2023

In order to reach the designated 2023 targets following support and incentive mechanisms are formed:

1. Feed-in Tariff Mechanism

Purchasing guarantee from a defined price has been given to electricity generated from renewables. According to this support mechanism, licensed and unlicensed facilities generating electricity from renewables which are operational currently and which will be in operation before December 31, 2020 benefit from this tariff system for a maximum term of 10 years from their operation date.

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<table>
<thead>
<tr>
<th>Generation Facility Type Based on Renewable Energy Resource</th>
<th>Feed-in Prices (USD Dolar cent/ kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Hydroelectric Generation Facility</td>
<td>7.3</td>
</tr>
<tr>
<td>b. Wind Energy Based Generation Facility</td>
<td>7.3</td>
</tr>
<tr>
<td>c. Geothermal Energy Based Generation Facility</td>
<td>10.5</td>
</tr>
<tr>
<td>d. Biomass Energy Based Generation Facility (including landfill gas)</td>
<td>13.3</td>
</tr>
<tr>
<td>e. Solar Energy Based Generation Facility</td>
<td>13.3</td>
</tr>
</tbody>
</table>

Source: YEGM

2. **Unlicensed Generation**

Real and legal entities that are generating electricity from renewable energy resource based generation facilities with maximum installed capacity of 1 MW can exploit from feed-in prices described at the schedule above in case they inject remaining electricity after satisfying their self-consumption to distribution system. Within this framework, distribution companies having electrical retail sales license has to purchase this energy. Distribution companies who are purchasing this energy according to this specific article consider purchased energy as generated and injected to system within context of Renewable Energy Support Mechanism. Board of Ministries has authority to maximum installed capacity limit of unlicensed power generation facilities based on renewable energy resources up to 5 times considering development of competition, technical capability of transmission and distribution systems, and enhancement of energy supply security.

3. **Local Content Support**

The usage of renewable energy resources has profound effects on creating and sustaining a clean environment, reduction of greenhouse gases, and reduction of imported energy amount thus fortifying energy independence, improving technological and industrial opportunities in renewable energy applications for local scope. Local content support, which can be considered as an extra bonus, shall be added to feed-in tariff of relevant renewable energy resource in order to encourage utilization of renewable energy resources.

In case of usage of local mechanical or electronic equipment in generation facilities, commissioned before 31 December 2020 and subject to the Renewable Energy Source (RES) Support Mechanism, then a local equipment bonus shall be added to the feed-in tariff relevant to this renewable energy
source accordingly. This additional tariff is provided for a term of five years from starting date of operation for a particular generation facility from a certain type of renewable energy resources.

This support prompted a definite increase in making investment for manufacturing of renewable energy equipment in Turkey in recent years.

<table>
<thead>
<tr>
<th>Generation Facility Type Based on Renewable Energy Resource</th>
<th>Applied Maximum Prices (USD dollar cent/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Hydroelectric Generation Facility</td>
<td>9.6</td>
</tr>
<tr>
<td>b. Wind Energy Based Generation Facility</td>
<td>11</td>
</tr>
<tr>
<td>c. Photovoltaic Solar Energy Based Generation Facility</td>
<td>19.5</td>
</tr>
<tr>
<td>d. Concentrated Solar Energy Based Generation Facility</td>
<td>22.5</td>
</tr>
<tr>
<td>e. Biomass Energy Based Generation Facility (including landfill gas)</td>
<td>18.9</td>
</tr>
<tr>
<td>f. Geothermal Energy Based Generation Facility</td>
<td>13.2</td>
</tr>
</tbody>
</table>

Source: YEGM

1.5. Turkey’s potential?

According to various resources Turkey has following minimum technical renewable energy potentials;
- 160,000 GWh/year economic hydraulic capacity
- 48,000 MW wind energy capacity
- 1,500 kWh/m2-year average global solar radiation
- 31,500 MWt geothermal capacity
- 8.6 MTOE biomass potential
- 1.5-2 MTOE biogas potential
2. Hydro power

'Target 2023 → 34,000 MW capacity of hydro power plants’

Hydroelectricity power stations are well known due to their environmentally friendly and carrying low potential risk. Hydroelectricity power stations take also the role of insurance in energy prices, have a long lifespan, low operating costs, and are not dependent on imports.

Turkey has a theoretical hydroelectricity potential of 1% of theoretical potential of the world, while its economic potential is 16% of the economic potential of Europe.

The hydraulic resources of Turkey holds the most important position in the renewable energy potential of 433 billion kWh, while the technically usable potential is 216 kWh, and the economic hydroelectricity potential is 140 billion kWh/year.

As of the end of 2013, 41% of the potential was in operation, and 27% was in the process of being built. Turkey continues to take steps towards developing the investment environment based on competition within the electricity generation sector, which has been opened up to the private sector, 560 licenses had been obtained as of January 2013 (a total capacity of 12.515 MW) in order to build hydroelectricity plants (HES).

As of the end of 2013, there were 467 HES plants, with a total installed capacity of 22.289 MW. This is the equivalent of 34,8% of the total potential. In 2013, 24,8% of our electricity output came from hydraulics.

As mentioned in the introduction section, the base line feed-in tariff for hydroelectricity generation is 7.3 USD cent/kWh. If the equipment is locally manufactured, the facilities can benefit from bonuses provided for locally manufactured equipment. The maximum feed in tariff price hydroelectricity generation facilities is 9.6 USD cent/kWh.

Baseline feed-in tariff is 7.3 USD cent/ kWh.

Bonus for locally manufactured component is an extra 2.3 USD cent/ kWh. Namely;
- Bonus for Turbine is 1.3 USD cent/ kWh
- Bonus for Generator/ Power Electronics is 1 USD cent/ kWh.
2. Wind power

‘Target 2023 → 20,000 MW capacity of wind power plants’

Turkey has the serious wind energy potential. Turkey has 11GW stock of the current Project and the capacity of 20 GW for the national goal in 2023 in terms of wind Energy, therefore, Turkey plays a vital role in the European market. In the future Turkey will probably play an important role in shaping the investment opportunities.

Wind potential of Turkey:

<table>
<thead>
<tr>
<th>Resource potential</th>
<th>Wind class</th>
<th>Annual wind power density (W/m²)</th>
<th>Annual wind speed (m/s)</th>
<th>Total capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>4</td>
<td>400 – 500</td>
<td>7.0 – 7.5</td>
<td>29,259.36</td>
</tr>
<tr>
<td>Excellent</td>
<td>5</td>
<td>500 – 600</td>
<td>7.5 – 8.0</td>
<td>12,994.32</td>
</tr>
<tr>
<td>Outstanding</td>
<td>6</td>
<td>600 – 800</td>
<td>8.0 – 9.0</td>
<td>5,399.92</td>
</tr>
<tr>
<td>Superb</td>
<td>7</td>
<td>&gt; 800</td>
<td>&gt; 9.0</td>
<td>195.84</td>
</tr>
</tbody>
</table>

**TOTAL CAPACITY**  

47,849.44

Below you will find the cities according to installed capacity for operational wind power plants (%)

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2 Please note: Wind energy potential (annual average wind speed>7 m/s), 50 m a.g.l. / Calculated for the places located at altitudes of lower than 1500 m.
Below you will find in picture 1, the annual installations for wind power in Turkey (MW) and in picture 2, the cumulative installations for wind power in Turkey (MW).

**Picture 1:**

**Picture 2:**

*source: TWEA*
Players in the wind energy

In the picture below, you will find the investors according to installed capacity for operational wind power plants.

source: TWEA

And in the picture below, you will find the turbine manufacturers:

source: TWEA

Opportunities

The Ministry of Energy and Natural Resources determined the baseline feed-in tariff for wind energy at 7.3 USD cent/ kWh. with an extra bonus for locally manufactured component (which is an extra 3.7. USD cent/ kWh.) namely for:

- Bonus for Blade is 0.8 USD cent/ kWh
- Bonus for Generator/ Power Electronics is 1 USD cent/ kWh
- Bonus for Turbine tower is 0.6 USD cent/ kWh
- Bonus for all mechanical equipment in rotor and nacelle is 1.3 USD cent/ kWh.
4. Solar Energy

‘Target 2023 → minimum 5000 MW of solar power plants’

Turkey is very lucky to possess a high solar energy potential, in terms of its geographical location. See below;

According to the Solar Energy Map (SEM) of Turkey prepared by the Renewable Energy General Directorate, it has been determined that the total annual insolation time is 2.737 hours (a total of 7.5 hours per day), and the total solar energy derived per year is 1.527 kWh/m² per year (total 4.2 kWh/m² per day).

In the picture below, you will see the average Global Solar Radiation of Turkey: 1,500 kWh/m²-year
Solar energy technologies are extremely varied in terms of their methods, materials and technological levels; they can be divided into two principal groups:

1. Photo-emissive Solar Technologies; and

2. Concentrated Solar Power (CSP):

In the first group, heat is obtained from solar energy, and can be used either directly or in the generation of electricity. In the second group, solar cells: Semi-conducting materials, which are also known as photovoltaic solar energy systems, convert the sunlight directly into electricity. Southeastern Anatolia in Turkey is examined on a regional basis, while the most fertile region in the Black Sea region is the most inefficient. Photovoltaic generators are suitable for all regions except Eastern Black Sea Region.

The total established solar collector area within our country as of 2012 was calculated as being close to 18,640,000 m². The annual production of plenary solar collectors was calculated as 1,164,000 m², while that of vacuum-tube collectors was 57,600 m². 50% of the plenary collectors and all of the vacuum-tube collectors which are produced are known to be used within the country. In 2012, close to 768,000 TEP (Tonnes Equivalent to Petrol) heat energy was produced using solar collectors. The use of the heat energy produced in 2012 was calculated as 500,000 TEP in homes and 268,000 TEP for industrial purposes.

The Renewable Energy Resources Legislation numbered 5346, which is necessary in order for the use of photovoltaic systems to become more widespread, was revised on 29.12.2010, and the studies concerning the Legislation were completed in 2013.

The technical evaluations of the applications made to EMRA for the licensed generation of electricity in 2013 are currently being carried out, and photovoltaic plant licenses will be given to 600 MW of installed capacity at this first stage. This capacity will be increased in stages in the coming years, with the target of our Ministry being a minimum of 3000 MW installed capacity of license PV plants in 2023.

There are also small-scale photovoltaic solar energy systems, which have already been established in our country, for the purpose of meeting small quantities of power, and for research purposes. Most of these have been established by public sector organisations, and these have reached an installed capacity of 3,5 MW.

The current development of solar

- **Installed photovoltaic capacity:**
  Estimated total installed capacity is around 75 MW (71.2 MW unlicensed). This includes the unlicensed facilities and off-grid systems.

- **Installed CSP capacity:**
  A 5 MW of power tower is constructed which is currently the only exemplar; CSP thermal energy production system with 500 heliostats in Mersin.

With the rapidly growing unlicensed market, both PV and CSP capacities are expected to reach to a competitive level in a very short period in Turkey. Currently, equipment production capacity of Turkey rapidly increases and some of the manufacturing facilities are under construction. PV module and cell manufacturing capacity are around 600 MW/year and 100 MW/year, respectively. A parabolic collector production facility with a capacity of 47 MW/year is also located in Ankara.
In order to use the entire solar potential effectively, solar electricity generation is classified in three categories:

- Off-grid
- Without license (up to 1 MW)
- Licensed

Applications of licensed solar energy (for 600 MW capacity) were accepted on 10-14 June 2013. Prelicensing process was completed with a total installed capacity of 600 MW in 20 provinces on April 2015. In this year (2015), construction of large scale solar power plants will be seen. See below, for the 121 sub-stations inside or near the promising areas.

Source: YEGM

**Feed-In Tariff**

- **CSP**

CSP technology has the highest feed-in tariff with 22.5 USD cent/kWh, which includes all local equipment bonuses, followed by PVs with 20 USD cent/kWh.

Locally manufactured component Bonus (USD cent/kWh)

- Radiation collector tube = 2.4
- Reflective surface = 0.6
- Sun tracking system = 0.6
- Mechanical components of heat energy storage system = 1.3
- Mechanical components of the steam generation system = 2.4
- Stirling engine = 1.3
- Panel integration and production of structural solar mechanics = 0.6

**Total 13.3 + 9.2 = 22.5**
PV

Locally manufactured component Bonus (USD cent/kWh)

PV panel integration and production of structural solar mechanics = 0.8

PV Modules = 1.3

PV Module Cells = 3.5

Inverter = 0.6

Material which focuses radiation on PV Module = 0.5

Total $13.3 + 6.7 = 20$
5. Geothermal Energy

'Target 2023 → 1000 MWe geothermal energy'

Geothermal energy is the heat energy obtained from the hot water, steam, dry steam and hot dry rocks, which have gathered within rocks in the depths underneath the soil, and have moved and were stored by the fluid heat, by artificial methods. Geothermal sources are mostly formed around active fault systems and volcanic and magmatic units.

Geothermal energy includes all types of direct or indirect benefit derived from geothermal sources. Low temperature (20-70°C) fields are used for heating in particular, as well as in industry, for the production of chemicals. Medium temperature (70-150°C) and high temperature (above 150°C) fields can be used for the generation of electricity as well as in heating applications, in an integrated manner, subject to the re-injection conditions. The top 5 countries in geothermal heat and hot springs applications are China, the USA, Sweden, Turkey and Japan.

As Turkey is situated on the Alps – Himalaya’s belt, it is a country with quite a high geothermal potential. In theory, the geothermal capacity of Turkey is 31,500 MW. 79% of the areas with a potential, are situated in Western Anatolia, 8,5% in Central Anatolia, 7,5% in the Marmara Region, 4,5% in Eastern Anatolia and 0,5% in the other regions. 94% of the geothermal resources are low and medium heat, and suitable for direct applications (heating, thermal tourism, the output of minerals, etc.), while 6% are suitable for indirect applications (the generation of electricity energy).

Below you can see the geothermal energy potential in Turkey;

![Geothermal Energy Potential in Turkey](image)

Source: YEGM

The current developments in Turkey

55% of the geothermal areas in Turkey are suitable for heating practices.
Greenhouse heating & 100,000 households in 19 settlements heated with geothermal energy.

Totally 28 projects of 654.67 MWe capacity are licensed and 431 MWe is under operation as of June, 2015

The Ministry of Energy and Natural Resources determined the baseline feed-in tariff for geothermal energy at 10.5 USD cent/ kWh. with an extra bonus for locally manufactured component (which is an extra 2.7. USD cent/ kWh.) namely for;

- Bonus for steam or gas turbines is 1.3 USD cent/ kWh
- Bonus for Generator/ Power Electronics is 0.7 USD cent/ kWh
- Bonus for steam injector or vacuum compressor is 0.7 USD cent/ kWh
6. Biomass Energy

‘Target 2023 → 1000 MWe installed capacity’

Biodiesel is obtained from agricultural plants, and converts CO2 by photosynthesis, ensuring the carbon cycle. Therefore, it does not have any impact of increasing the greenhouse effect.

The total consumption of fuels in Turkey is 22 million tons. 3 million tons of this is petrol. In contrast to this the installed capacity for biodiesel in Turkey is 160 thousand tons.

See below the Biomass potential of Turkey

Source: YEGM

- Total Amount of Waste from Forests is 4,800,000 Tons (1.5 MTOE-600 MW)
- From Agriculture 15,000,000 Tons (300 PJ)

The current developments in Turkey

- 34 Biodiesel facilities received Processing License for biodiesel production.
- Total biodiesel production capacity of all these facilities is 561,217 tons.
- The biodiesel production is 21,876 tons in 2013.
- Estimation at least 1.2 million ton/year biodiesel and 0.7 million ton/year bioethanol production capacity based on 2.7 million hectare agricultural land.
- 1.5 - 2 MTOE biogas potential.
- Almost 180 million m3/year biogas produced by 20 running biogas plants.
- Recently landfill gas extraction gained importance (total capacity 162,7 million m3/year).
The Ministry of Energy and Natural Resources determined the baseline feed-in tariff for biomass energy at 13.3 USD cent/ kWh. with an extra bonus for locally manufactured component (which is an extra 5.6 USD cent/ kWh.) namely for:

- **Bonus for Steam boiler with fluid bed is 0.8 USD cent/ kWh**
- **Bonus for Liquid or gas fired steam boiler is 0.4 USD cent/ kWh**
- **Bonus for Gasification or gas removal group is 0.6 USD cent/ kWh**
- **Bonus for Steam or gas turbine is 2 USD cent/ kWh**
- **Bonus for Internal combustion or stirling engine is 0.9 USD cent/ kWh**
- **Bonus for Generator and power electronics is 0.5 USD cent/ kWh**
- **Bonus for Cogeneration system is 0.4 USD cent/ kWh.**
7. (Nuclear)

In order to meet the fast rising demand for electricity, and reduce the risks associated with being dependent on imports, Turkey have planned to take 2 nuclear power plants (NPP) into operation by 2023, and to begin the construction of a further 3 NPP during the same period.

With this purpose in mind, the company, Akkuyu Nükleer Güç Santrali Elektrik Üretim A.S., which was established within the framework of the agreement between the Republic of Turkey and the Russian Federation, which took effect on 27 December 2010, for the establishment of a nuclear power plant in the Mersin – Akkuyu field, and the capital of which Russian in full, prepared an “Updated Location Report” and submitted this for assessment by the Turkish Atomic Energy Authority (TAEK), on 22 May 2012. TAEK informed the project company on 08 June 2012 that the report was being examined in detail. Together with this agreement, it is envisaged that a nuclear plant comprising four VVER-1200 type units, and with a total installed capacity of 4,800 MW. On the other hand, an agreement was also signed in 2013, for the establishment of a nuclear plant in Sinop, and the work related to this is currently ongoing.

Based on the supply and demand projections for electricity energy in Turkey, it is aimed that the share of the electricity generated by nuclear energy plants within the total, reach 5% by 2020. With this purpose in mind, the Legislation on the Establishment and Operation of Nuclear Power Plants, and their Sales of Energy, numbered 5710, was passed in 2007.

When taking into account the nuclear plants to be established in Akkuyu and Sinop, approximately 80 billion kWh of electricity output is expected per year. In order to be able to generate this amount of electricity from natural gas, close to 16 billion cubic meters of natural gas would need to be imported, in return for a payment of 7,2 billion US Dollars (close to 13 billion TL). Thus, the money used to pay for this amount of natural gas imports in just 3 years will be enough to build a 4 unit nuclear plant in Mersin – Akkuyu.
8. Industry Associations & Government Contacts

- Ministry of Energy & Natural Resources (MENR)
  Tel: + 90 312 212 64 20
  Internet: www.enerji.gov.tr

- Energy Market Regulatory Authority (EPDK)
  Tel: +90 312 40 00 – 201 40 01 – 201 40 02
  Internet: www.epdk.gov.tr

- Electricity Generation Company
  Tel: +90 312 212 69 00
  Internet: www.euas.gov.tr

- Turkish Electricity Distribution Company
  Tel: +90 312 212 69 15
  Internet: www.tedas.gov.tr

- Turkish Association of Electricity Producers’ Association
  Internet: www.eud.org.tr

- Association of Cogeneration and Clean Energy Technologies of Turkey (TURKOTED)
  Internet: www.turkoted.org

- Wind Energy Association (TUREB)
  Tel: +90 (312) 474 0274
  Internet: www.tureb.com.tr

- Solar Energy Industry Association
  Internet: http://gensed.org/

- International Solar Energy Society Turkish Department
  Internet: http://www.gunder.org.tr/

- Energy Institute
  Internet: http://enerjienstitusu.com/

- Geothermal Association of Turkey
  Internet: http://www.turkishgeothermal.com/

-Biyogazder
  Internet: http://www.biyogazder.org/
9. Trade fairs and journals

i. Trade Fairs

- Energy Efficiency Forum and Fair (January)
- Dam Hydropower Fair (January)
- Expo Geothermal Energy Technologies and Equipments (January)
- Solarex (April)
- ICCI, International Energy and Environment Fair and Conference (May)
- All Energy Turkey (September)
- Rensef, Renewable Energy Systems and Energy Efficiency Exhibition (October)
- Wind Energy Fair (October)
- Energy is Future/ Geothermal (November)

*All fairs in Turkey can be reviewed at: www.fairguide.org.tr

ii. Journals

- Energy Efficiency Journal
  http://www.enverdergisi.com/
  http://www.teknikyayincilik.com/
- Global Energy
  http://www.globalenerji.com.tr
- Energy World
  http://www.energyworld.com.tr
- Energy Dunyası
  http://www.enerji-dunyasi.com/
- Enerji Gazetesi
  http://www.enerjigazetesi.com/
- Gunes Dergisi
  http://www.gunesdergisi.com/web/default.asp
10. Contact

Companies that are interested in obtaining further (more detailed) information on the sub sectors or about projects, are kindly invited to contact the economic and commercial department of the Embassy of the Kingdom of the Netherlands in Ankara.

Contact details:

Economic and commercial department
Contact: Derya Kaplan
Phone : +90 312 409 1823
E-mail : derya.kaplan@minbuza.nl

Address: Turan Gunes Bulvari, Hollanda Caddesi no.5, Yildiz/ Ankara
References

*Ministry of Energy and Natural Resources
  - Strategic Plan;  

*Renewable Energy Directorate General (YEGM)
  - http://www.eie.gov.tr/ (Turkish)

*Investment support and promotion agency

*Wind Energy Association (TWEA)