



**ROYAL DANISH
CONSULATE GENERAL**
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DISTRICT HEATING MARKET OPPORTUNITIES IN TURKEY

Prepared by The Trade Council of Denmark in Istanbul





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1. DISTRICT ENERGY MARKET IN TURKEY

1.1 COUNTRY STATUS

With its 83 million ever growing population living mostly in urban areas, the need for efficient and cost competitive heating is evident in Turkey with a great potential of using its vast renewable energy sources as well as excess heat from the industry.

One of the 55 actions of the National Energy Efficiency Action Plan that covers areas such as buildings, services, energy, transport, agriculture¹ is to promote district heating and cooling systems in Turkey.

Table 1: National Energy Efficiency Action Plan

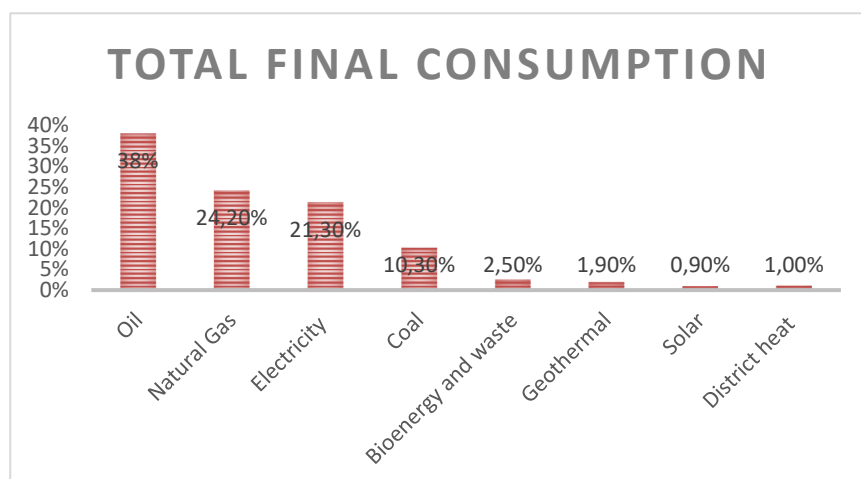
Action Code and Title	Promote central and district heating & cooling systems
Goal	Increase energy savings and use of renewable energy for heating & cooling by switching to central and district heating systems in mass housing complexes and large settlement units.
Activities to Undertake	In line with the outputs from the action "E1. Identify the potential of cogeneration and district heating & cooling systems and prepare a roadmap", obligation conditions will be explored for new buildings and settlement units, and incentive programmes for existing buildings. It will be mandatory to conduct economic feasibility studies for cogeneration systems supported by renewable energy and heating & cooling systems for the new built mass housing complexes with legislative amendment. Direct or indirect incentives will be defined for mass housing complexes and large settlement areas identified as having high potential. For district heating systems, maximum use will be made of geothermal potential, if present in the region, and waste heat from industry and power plants.
Outputs and Indicators	Legislative framework developed number of feasibility studies, central and district heating applications
Responsible Institutions	Ministry of Environment and Urbanisation, Ministry of Energy and Natural Resources
Relevant Institutions	Ministry of Finance, TOKI
Timeline	Technical and legislative work will be undertaken in 2018. The implementation will start from 2020 in mass housing complexes depending on the economic feasibility. It will be scaled up through mass housing complexes to be built in 2020-2022. For existing high-potential mass housing complexes, the practice will be scaled up by end of 2023.

Source: National Energy Efficiency Action Plan (NEEAP) 2017-2013, Republic of Turkey Ministry of Energy Resources and National Energy, www.yegm.gov.tr

Turkey has been using district heating systems since 1980s using geothermal power as the main source. The use of district heating compared to other forms of energy such as oil, coal etc. is still limited (see Figure 1) and under its vast potential. Giving the fact that around 40 large scale solar thermal heat plants are widespread in cold Denmark, Turkey offers great potential not only using sun for district heating but also other renewable energy sources.

¹ [National Energy Efficiency Action Plan \(NEEAP\) 2017-2023 \(EN\).pdf](#)

Figure 1: Total Final Consumption



Turkey is the 4th richest country in the world² in terms of its considerable large geothermal sources that are very close to the Earth surface where temperatures are very high.

In this framework, currently Turkey has:

- 25 district heating systems using geothermal as the main source.
- It is estimated that around 140.000 households are supplied by geothermal-fuelled district heating, and a very small amount of households are fuelled by waste-heat of power plants, Soma Thermal Power Plant as the main example. (The special project financed by the Danish Exim Bank EKF).
- Since 1960's, 239 geothermal fields have been identified in Turkey, which represents an estimated potential of 60.000 Megawatts thermal.³

Table 2: District Heating Systems in Turkey

Name	Type	City	Est.	No. of DH users	Water temp [C]	Investor
İzmir-Balcova+Narlıdere	Geothermal	Izmir	1983	37,000	125	Joint Stock Company, Province & Municipal adm.
Gönen	Geothermal	Balıkesir	1987	2,500	80	Municipal corp

² [Top 10 Geothermal Countries 2020 – installed power generation capacity \(MWe\) | ThinkGeoEnergy - Geothermal Energy News](#)

³ [World Bank Document](#)

Sındırgı	Geothermal	Balıkesir	2014	3,000	98	Municipal corp
Simav	Geothermal	Kütahya	1991	13,000	165	Municipal corp
Kırşehir	Geothermal	Kirsehir	1994	1,800	57	Special provincial adm of the municipal corp
Kızılcahamam	Geothermal	Ankara	1995	2,500	80	Municipal corp
Afyon	Geothermal	Afyon	1996	10,000	95	Special provincial adm of the municipal corp
Kozaklı	Geothermal	Nevşehir	1996	1,300	90	Municipal corp
Sandıklı	Geothermal	Afyon	1998	13,700	70	Municipal corp
Dişadin	Geothermal	Ağrı	1999	540	78	Provincial Adm.
Salihli	Geothermal	Manisa	2002	8,000	95	Municipal corp
Sarayköy	Geothermal	Denizli	2002	2,200	140	Municipal corp
Edremit	Geothermal	Balıkesir	2003	5,500	60	Municipal+Private company
Bigadiç	Geothermal	Balıkesir	2005	3,000	95	Municipal corp.
Sarıkaya	Geothermal	Yozgat		500	50	Provincial Adm + Municipality + private sector company
Sorgun	Geothermal	Yozgat	2008	1,500	80	Municipal corp.
Yerköy	Geothermal	Yozgat		250	60	Provincial Adm + Municipality + private sector company
Güre (Edremit Geothermal)	Geothermal	Balıkesir		700	55	Municipal corp.
Dikili	Geothermal	Izmir		2,000	100	Municipal corp.
Bergama	Geothermal	Izmir		400	60	Municipal corp.
Esenyurt	Thermal Power Plant (Natural gas)	Istanbul		10,000	—	PPP System; will be public in 2020
Eskişehir Şeker Fabrikası	Sugar Refinery	Eskisehir		410	—	State owned
Kayseri Şeker Fabrikası	Sugar Refinery	Kayseri		50	—	Cooperative structure
Ankara Şeker Fabrikası	Sugar Refinery	Ankara		280	—	State owned
Soma	Thermal Power Plant (Coal)	Manisa		8,000	110	Municipal corp.

As seen above, most district heating systems in the country are operated by municipalities, municipality affiliates or a company, which is ruled by public administration.

1.2 TURKEY AND ITS RENEWABLE ENERGY POTENTIAL

Below part shows the rapid development of the Turkish renewable energy sector including county targets.

Figure 2- Overview of the Turkish Electricity Market 2021

Development of Non-Hydro Renewables	December 2007	August 2021	% of Total Capacity as of August 2021
 Wind Large amount of investments due to attractive FIT Schemes under YEKDEM	148 MW	10,014 MW	10.2%
 Solar Strong growth in the past few years, mainly attributable to unlicensed generation	0 MW	7,435 MW	7.5%
 Geothermal High number of geothermal sources in Turkey which can be utilized for generation	23 MW	1,650 MW	1.7%
 Biomass Less interest due to high CAPEX and dependency on external source factors (waste collection).	21 MW	1,813 MW	1.8%

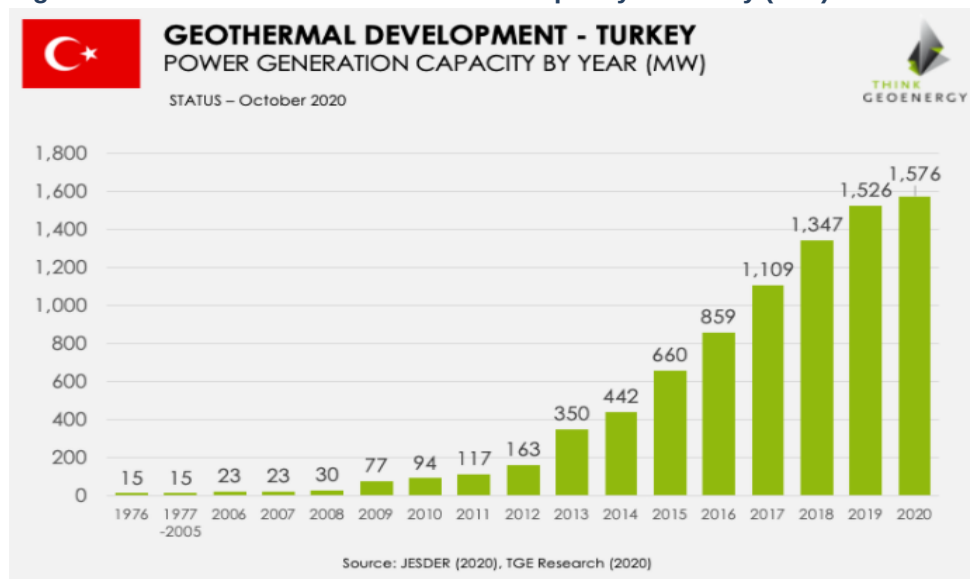
Source; Overview of the Turkish Electricity Market 2021, PwC and the Investment Office of the Presidency of the Republic of Turkey

According to the 2019-2023 Strategic Plan of the Ministry of Energy and Natural Resources, Turkey targets to increase its domestic and renewable energy production in the overall energy mix to 65 %.

Table 3: Target for Renewable Installed Capacity (Mw)

Solar	10,000 MW
Wind	11.833 MW
Geothermal and Biomass	2,884 MW

Figure 3: Geothermal Power Generation Capacity in Turkey (MW)



Source: ThinkGeoEnergy, <https://www.thinkgeoenergy.com/three-new-geothermal-power-plants-push-total-capacity-to-1576-mw-in-turkey/>

2. RATIFICATION OF THE PARIS AGREEMENT & NEW OPPORTUNITIES

With the Ratification of the Paris Agreement in October 2021, Turkey showed its willingness and commitment to align and cooperate with the rest of the world in order to achieve CO2 emission reduction. To achieve the goals that were set in the Paris Agreement and the Energy Efficiency Action Plan, the development of the district heating in the country is a mean to a greener end with Turkey's huge geothermal and renewable energy sources.

2.1 DECLARATION ON THE ROAD TO GREEN DEVELOPMENT

In February 2022, the Minister of Environment, Urbanization and Climate Change Murat Kurum announced the Declaration on the Road to Green Development.

The Declaration revealed the prospects of utilizing waste heat from industrial facilities as a heating source in homes and workplaces. According to the Minister, with this new approach, Turkey will be able to reduce the heating costs of their citizens by 30 percent. Based on calculations of the waste heat potential of all thermal power plants in Turkey, the utilization of waste heat is able to heat 4 million houses. Turkey will as a result be able to reduce the heating costs of approximately 16 million citizens by 30 percent by using the full potential of waste heat in thermal power plants.

Additionally, as of next year, it becomes mandatory in Turkey that for buildings with a total construction area of more than 5000 m2 have to meet at least 5% of their energy from renewable sources.

The Declaration further mentioned following goals:

- Preparations for the Climate Law will be completed within 6 months
- With the waste heat project, residential heating cost will decrease by 30%.
- Increasing minimum energy performance from C to B in new buildings 25 percent savings will be achieved in the water used in the buildings

3. G2G COOPERATION BETWEEN TURKEY AND DENMARK

Since 2017, Turkey and Denmark has an ongoing Government to Government (G2G) cooperation on efficient and low carbon energy supply between the Turkish Ministry of Energy and Natural resources and the Danish Energy Agency (DEA). G2G is an exchange of experience and knowledge between Danish and Turkish government officials, with the objective of supporting Turkey in further

developing proper framework conditions for district energy and off-shore wind. The SSC activities are funded by the Danish Ministry of Foreign Affairs.

Figure 4- SSC between Denmark and Turkey



Since 2021, The SSC team in cooperation with the Danish Energy Agency and the Ministry of Energy in Turkey has been coordinating a pilot-heat planning study in Manisa and Kütahya municipalities to assess the potential for district heating through heat planning and mapping activities.

3.1 COOPERATION OPPORTUNITIES BETWEEN TURKEY AND DENMARK

District energy is corresponding well with the market developments and needs of Turkey. The Trade Council of Denmark in Turkey is providing support to the Danish companies in the district energy market of Turkey with a focus on:

- Innovative Technologies/Products/Services
- Cogeneration Systems using Excess Heat
- Heat pumps, pre-insulated pumps, biomass boilers, software systems, variable flow and speed-controlled pumps
- Partnerships with Turkish companies
- Local production and company establishment using Turkey as a regional hub



➤ FURTHER OPPORTUNITIES FOR DANISH COMPANIES

- Unique location

As the **intersection point of Europe**, Central Asia and Middle East, Turkey is a gate to these regions. More energy transformation projects will be adopted in the Middle East and North Africa Region. Thanks to geographical and cultural proximity, Turkey can be used as a **hub** to those growing markets.

- Skilled labour force

- Component sourcing

In the post Covid 19 world, Turkey has been a competitive sourcing destination with its proximity to Europe.

- A Great number of government incentives.
- Partnership and production opportunities with Turkish Companies.
- Strategic Sector cooperation Project and government-to-government cooperation between Turkey and Denmark on offshore and onshore wind will create the framework for business development for Danish companies.



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