Geothermal Electricity Generation in Turkey: Large Potential Awaiting Investors

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Turkey is a country with ample geothermal energy resources.[1] Even though it is a clean, sustainable and homegrown (as opposed to oil and gas, which are mainly imported) source of energy, due to high development costs the use of geothermal for electricity generation is relatively low.

The current installed geothermal electricity generation capacity in Turkey is MWe 820.9[2] with a total of 31 plants in operation. This represents less than one percent of total nationwide installed electricity generation capacity.[3] The total electricity produced in geothermal plants is 336,325 MWh, which barely makes 1.62% of total electricity production.[4]

The Ministry of Energy's target capacity for geothermal electricity generation is 1 GWe by 2023. As part of its geothermal strategy, the Turkish government applied to the World Bank for funding to promote geothermal investments. The project, which was announced by the World Bank on November 1, 2016, is explained below in greater detail.

I. Legal Framework

Pursuant to the Turkish Constitution, all natural resources are under full control and ownership of the state. Exploration and operation rights of natural resources which belong to the state may be transferred to individuals or legal entities for a limited time period in accordance with applicable legislation.

1. GEOTHERMAL EXPLORATION AND OPERATION ACTIVITIES

Development of geothermal resources requires (i) an exploration license, and (ii) an operation license.

a. Exploration License:

An exploration license enabling the holder to carry out exploration activities in a specific geographical area, based on the project documents filed with the General Directorate of Investment and Coordination (*Yatırım İzleme ve Koordinasyon Başkanlığı*) or the Provincial Special Administration (*İl Özel İdaresi*) of the respective province's governorship (the "Administration"), is issued by the General Directorate of Mining Affairs of the Ministry of Energy.

Exploration licenses are granted for three-year terms commencing on the date of the registration of the license with the relevant Administration. The term may be extended one time for a period of up to one year with the consent of the Administration or the Ministry of Energy.

In addition to the licensed exploration activities conducted by private entities, the General Directorate of Mineral Research and Exploration (*Maden Tetkik ve Arama Genel Müdürlüğü*) ("MRE") also conducts licensed exploration activities for geothermal resources. Operating licenses for the commercially viable geothermal resources identified by MRE are sold via public auctions to private entities. Winning bidders conclude a resource-use agreement with MRE and apply for an operating license.[5]

b. Operation License:

An operation license enables the holder to use geothermal water, gas and steam for energy production, heating or for other industrial purposes. An exploration license holder must apply for an operation license before the expiration date of the exploration license. The exploration license holder must submit a project to the Administration or the Ministry of Energy with a timeline for commencement of operations.

The duration of an operation license is 30 years commencing on the date of the registration with the Administration. The term may be extended indefinitely for further ten-year periods.

An operation license may be transferred, pledged or leased to a third party.

After securing an operation license, the holder has three months to apply for other required assessments and permits, including the certificate of Environmental Impact Assessment (the "EIA")[6], to avoid cancellation of the operation license.

If the operation license is secured for power generation, the license holder must apply to EMRA for a generation license within 15 days. The operation license will be cancelled if the operation license holder fails to timely file the application or if the application is rejected. The EIA must be completed during the preliminary license period, which is explained in further detail below.

Failure to commence operations by the deadline specified in the operation license may result in cancellation of the license and the cashing of bid bonds deposited by the license holder with the Administration.

2. ELECTRICITY GENERATION

There are two types of electricity generation from geothermal sources: licensed and unlicensed.

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a. Licensed Generation:

A generation license grants its holder the right to construct and operate an electricity generation facility with the purpose of selling the generated power. Generation activities require the issuance of a preliminary license in order for the project company to start the construction of the generation facility.

i. Preliminary License

During the pre-construction stage generators are issued a preliminary license. This will be replaced by a generation license at the beginning of construction. The generator must obtain the required permits, approvals and licenses to commence construction and also secure title to or right of use of the relevant land during the pre-licensing period. Generally, the pre-licensing period is 24 months. Force majeure events (unavoidable and unforeseeable events beyond the reasonable control of the generator, including acts of God and war) or extensions (not to exceed an additional 12 months) may also be granted by EMRA. If the generator fails to secure the required permits, approvals or licenses within the pre-licensing term, no generation license will be issued. Direct or indirect changes in the shareholding structure of the generator are prohibited during this period. Any such changes or the failure of the generator to fulfill any requirements imposed by EMRA will result in the revocation of the pre-license.

ii. Generation License

Following the end of the preliminary license period, provided that all the conditions are met, EMRA will issue the generation license for a maximum period of 49 years.

The construction period, the construction completion date and the projected annual electricity generation amount will be indicated on the generation license.

b. Unlicensed Generation (License-Exempt Generation):

Certain generation activities may be undertaken without a license and are free from the requirement to form a separate entity for such activities. In general, private individuals and entities may directly or indirectly own and operate renewable energy generation facilities with a total installed capacity of 1MW or less. Excess power not consumed by the generator may be sold back to the grid using the appropriate feed-in rate.

3. ISSUES TO CONSIDER

a. Environmental Issues

Exploration, operation activities and subsequent electricity generation are subject to completion of the EIA process. The Regulation on Environmental Impact Assessment (the "EIA Regulation") sets out the framework of the EIA process.

The EIA Regulation divides investment types into two different environmental risk profiles with different approval processes for each. Category one is comprised of projects that are likely to have significant adverse effects on the environment. Geothermal projects generating MWe 20 or more fall into this category. Category one projects require an environmental impact assessment report prepared by the project owner. After review of the report and the project by a special committee and public consultation meetings, the Ministry of Environment issues an "Environmental Impact Assessment Affirmative" or "Environmental Impact Assessment Negative" decision. In case of an Environmental Impact Assessment Negative decision, the project may not be developed.

The second risk category includes projects that are within certain safe harbor guidelines and are deemed less likely to have serious impact on the environment. Investments in category two are generally considered to be less risky, and therefore the assessment procedure for these projects is less burdensome than the EIA process required for risk category one projects.

For risk category two projects, the Ministry of Environment determines after review of the applicant's file whether an EIA process should be commenced. If the Ministry of Environment issues an "Environmental Impact Assessment Not Necessary" decision, the project may be carried out without further assessment. If, however, an "Environmental Impact Assessment Necessary" decision is issued, the more burdensome process described above is triggered. Geothermal projects generating MWe 5 up to MWe 20 are within this category.

b. Land Issues

The title to or the usage right of a project site must be secured during the preliminary license period. State-owned land includes land registered in the name of the Treasury as well as other land under the control or at the disposal of the state. Legal use of such land may be secured by acquisition through tender or through servitude rights.

Application for use of forest lands must be made to the Ministry of Forestry and Water Affairs Regional Directorate. An initial permit, granted for a period of 24 months (subject to extension up to 36 months), is granted to allow the permit holder to secure all environmental and zoning approvals. No construction may be made during the initial permit period. Upon securing of all necessary approvals, a final permit for up to 49 years is granted.

Turkish real estate regulations impose certain restrictions on ownership of real estate by companies with foreign shareholding. Project land acquisition, regardless of the development phase of the project, may be subject to approval processes.

The ownership right of land does not encompass the ownership right of geothermal resource on such land. Therefore, although land containing geothermal resources may be owned by a private entity, the state ultimately owns the geothermal resources within that land.

4. BENEFITS AND INCENTIVES

Geothermal power plants that opt into the renewable energy support mechanism may benefit from feed-in rates provided by the Renewable Energy Law. The feed-in rate of US$ 105 mWh is valid for a period of 10 years for any geothermal facility operational by December 31, 2020. If a generator uses locally manufactured parts an additional contribution (see table on next page) will also be added.

The Renewable Energy Law also provides for a reduction of 85% on fees related to

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rent, right of access and usage permission for the first 10 years of operation for power plants commissioned prior to December 31, 2020 on land owned by the Treasury.

Geothermal power plants also benefit from the general incentive program of the Ministry of Economy if the project meets the criteria under the applicable rules. Incentives may include exemption from customs duties for imported machinery and equipment and exemption from value-added tax for imported or domestically purchased machinery and equipment.

	Locally Manufactured Product	Additional contribution (USD /mWh)
Geothermal Facility	Steam or gas turbine	13
	Generator and power electronics	7
	Steam injector or vacuum compressor	7

II. Financing Geothermal Projects — World Bank and European Bank for Reconstruction and Development Initiatives

The World Bank announced on August 25, 2016 that Turkey applied for up to US$290 million to fund the "Turkey Geothermal Development Project" with US$40 million of the US$290 million sought to be covered by the Bank's Clean Technology Fund. The project, to be implemented by Türkiye Kalkınma Bankası A.Ş. (the Development Bank of Turkey), a public development bank, and Türkiye Sınai Kalkınma Bankası A.Ş. (the Industrial Development Bank of Turkey), Turkey's first private development bank, was announced by the World Bank on November 1, 2016.

The Turkey Geothermal Development Project, which has two components, aims to boost the geothermal sector by helping to minimize developer risk at the exploration stage and by providing long-term financing for the development and operation stages. The first component of the project, a Risk-Sharing Mechanism funded by the Clean Technology Fund's US$40 million contribution, is designed to support geothermal investments early in the exploration and resource verification stages. If, for example, an exploratory well does not yield a pre-specified amount of output, the risk allocation mechanism will cover a certain percentage of the investor's drilling costs. The risk-sharing mechanism will be administered and managed by the Development Bank of Turkey. The second component of the program focuses on the financing of geothermal investments made by the private sector companies throughout Turkey. The Development Bank of Turkey and the Industrial Development Bank of Turkey will both use the credit line provided by the World Bank specifically to support geothermal developers. Loans will be granted at market rates but with longer tenors than currently available.

The European Bank for Reconstruction and Development (EBRD) announced in January 2016 that it set aside US$ 100 million for geothermal financings in Turkey. EBRD also partnered with the Clean Technology Fund to invest an additional US$25 million on exploring further geothermal capacity in Turkey. EBRD has so far played a key role in securing financing for geothermal projects and it seems that their contribution will continue.

1 Turkey's untapped geothermal energy potential is estimated as 31.500 MWt (MW thermal), according to General Directorate of Mineral Research and Exploration.

2 According to the Geothermal Resource Association data, Turkey is ranked 8th globally in terms of operating capacity. The US takes the first place with a 3,567MW capacity, followed by Philippines and Indonesia, having 1,930MW and 1,375MW respectively.

3 Based on TEİAŞ (Turkish Electricity Transmission Company) data as of December 2016.

4 Based on EMRA (Energy Market Regulatory Authority) data as of October 2016.

5 Public auctions will be held by MRA on January 26, 2017 for the operation rights to two different geothermal sites and on February 7, 2017 for seven geothermal sites.

6 The environmental impact assessment is analyzed to minimize the negative environmental effects of industrial projects.

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