

**PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE**

Report No.: PIDA73074

Project Name	Turkey Geothermal Development Project (P151739)
Region	EUROPE AND CENTRAL ASIA
Country	Turkey
Sector(s)	Other Renewable Energy (80%), General energy sector (20%)
Theme(s)	Climate change (20%), Infrastructure services for private sector development (80%)
Lending Instrument	Investment Project Financing
Project ID	P151739
Borrower(s)	Türkiye İř Bankası A.ř. (TSKB), Türkiye Kalkınma Bankası A.ř. (TKB)
Implementing Agency	Türkiye İř Bankası A.ř. (TSKB), Türkiye Kalkınma Bankası A.ř. (TKB)
Environmental Category	F-Financial Intermediary Assessment
Date PID Prepared/Updated	13-Jun-2016
Date PID Approved/Disclosed	20-Nov-2015
Estimated Date of Appraisal Completion	10-Jun-2016
Estimated Date of Board Approval	29-Sep-2016
Appraisal Review Decision (from Decision Note)	N/A
Other Decision	N/A

I. Project Context
Country Context

Turkey's economic development in the post 2001 period has resulted in impressive economic achievements. After a banking crisis in 2001, the country embarked on a concerted path of structural reforms supported by strong fiscal consolidation, strengthened banking supervision, and a shift to a flexible exchange rate regime with an independent central bank responsible for inflation targeting. Per-capita income almost tripled in less than a decade, and Turkey is now an upper middle-income country with the world's 17th largest economy. After a swift rebound from the recession in the Global Economic and Financial crisis in 2008-09, concerns over Turkey's vulnerability to tightening global liquidity as well as domestic political uncertainty have dented investor appetite; as a result, economic growth slowed since 2012. Election-related uncertainties, geopolitical developments and concerns over the government's handling of corruption allegations dampened confidence and weakened private demand in 2014. Thus, despite robust exports and supportive government spending, GDP growth slowed to 2.9 percent in 2014. Exchange rate pass-

through and higher food prices pushed inflation to 9.5 percent by mid-2014, almost twice the central bank's target rate, but the 12-month inflation rate slowed to 7.6 percent in March 2015. Moderate growth and exchange rate depreciation reduced external imbalances, and the current account deficit (CAD) narrowed to below 5.4 percent of GDP in January 2015, from close to 10 percent in 2011.

Economic activity is expected to remain subdued in the first half of 2015, limiting the full year growth rate to 3.0 percent in 2015. Households and corporates are expected to postpone their spending decisions due to political uncertainty until the June elections. Fiscal policy will remain accommodative and growth supportive until the General Elections, but expected to be partially reversed afterwards. The absence of strong import demand from European Union and geopolitical problems in the region will limit export performance throughout 2015. In our baseline scenario, we forecast private spending to recover in the second half of 2015, when the political uncertainty is resolved, as households and corporates carry out their postponed spending. The contribution of net exports is expected to turn negative again, as the recovery after General Elections will boost real import demand while export growth remains moderate. The weaker than expected performance in the second half of last year will carry over into this year, combined with slower than expected growth until the elections, will limit annual growth rate in 2015, despite the expected recovery in the second half of 2015. The expected strong recovery in the second half of this year is likely to continue in the first half of 2016, however. Thus, we project growth to marginally rise to 3.0 percent in 2015 and accelerate to 3.9 percent by 2016. For 2017, we expect growth to slow down towards its new potential growth rate. The fall in oil prices will contribute to reducing Turkey's current account deficit to 4.4 percent of GDP in 2015. Accordingly, the external financing requirement is expected to decline to about US\$200 billion in 2015, from US\$220 billion in 2014. In addition, we expect inflation to slow to 7.0 percent in 2015, thanks to the fall in oil prices.

Over the medium-term, Turkey's growth prospects depend on private investment spending and productivity growth. Persistent investment weaknesses lowered Turkey's GDP growth in the aftermath of the Global Financial Crisis. Pursuing a credit-driven consumption-based growth strategy to boost economic growth is no longer a viable option for Turkey. Households and corporates are now more leveraged compared to the early 2000s, and the banking sector's room for supporting high rates of credit growth is markedly diminished, given that the loans-to-deposit ratio stands at about 115 percent. In addition, profitability in the banking sector almost halved since the pre-crisis period, as indicated by return-on-assets and return-on-equity ratios. Restoring investor and consumer confidence will hinge on the government's determination to address the economy's structural bottlenecks through supply-side reforms. Strong reform signals would revitalize private investment spending and boost TFP growth. Higher GDP growth is needed to continue Turkey's convergence process. Most notably, new reform momentum is much needed to improve the quality of education and to upgrade skills. Boosting productivity growth and creating enough high productivity jobs to accommodate Turkey's rapidly rising labor force are critical to create shared prosperity in Turkey.

Sectoral and institutional Context

Maximizing exploitation of domestic primary energy resources and securing reliable and affordable energy to a growing economy in an environmentally sustainable manner has been, and remains, the Government of Turkey's core energy policy priority. The Electricity Sector Security of Supply Strategy (2009) and the National Renewable Energy Action Plan (2014) identified a target of

increasing the share of electricity generated from renewable energy to 30% of the total 100 GW installed power generation by 2023 (including wind, hydro, solar and geothermal). The 2005 Renewable Energy Law, a major milestone, established purchase guarantee and Feed-in-Tariff mechanism for electricity produced from renewable energy sources. The government also facilitated access to renewable energy financing provided by International Financial Institutions (IFIs) such as World Bank Group and EBRD, as well as Bilateral Institutions (such as AFD and KfW).

In this context, the Government of Turkey (GoT) has set a target of developing 1,000 MW of geothermal by 2023 (National Renewable Energy Action Plan, 2014) and has put in place a supportive legal framework to facilitate geothermal development. A critical milestone was the Geothermal Law of 2007, which set out the rules and principles for effective exploration, development, production and protection of geothermal and natural mineral water resources. The Law also clarified the right of economic use of subterranean resources, which rests with the provincial authorities, and the applicable environmental regulation in project development, including proper land reclamation after use. The licensing procedures were also clarified under the law: four-year exploration licenses can then be followed by thirty year exploitation licenses which are issued to developers ? public and private alike ? by provincial authorities where the geothermal sites are located. In addition, for the production of electricity, thirty year energy generation licenses (power) are issued by the Energy Market Regulatory Authority (EMRA). Finally, the 2010 amendment to the Renewable Energy Law established a feed-in tariff of 10.5 US\$ cents per kWh for geothermal power, for a 10 year period from the commissioning date; with an additional 2.7 US \$ cents per kWh to reward the use of locally produced equipment.

Besides the enhanced regulatory framework, the exploration activities conducted by the General Directorate of Mineral Research and Exploration of Turkey (MTA) have been a critical driver behind geothermal development in the country. Established in 1935, MTA has been responsible for the exploration and mapping of geothermal resources in Turkey and has traditionally been the main institution advancing the development of geothermal utilization. MTA prioritized 25 sites, out of a total of 190 geothermal sites discovered, which were deemed suitable for electricity production. Those 25 sites were subsequently explored, mostly by MTA performing additional surface exploration and drilling exploratory wells, and then developed by private sponsors. As of June 2016, geothermal generation capacity in the country has reached a total of 695 MWe. All the MTA prioritized sites and current installations are located in the provinces of Aydin, Denizli (Menderes graben) and Manisa (Gediz graben), and had been explored to different degrees by MTA, which had mitigated the associated resource risk. Thermal applications (i.e. greenhouses, drying and cooling, district heating and spas), with a total of 2,880 MWt installed as of January 2015, are not concentrated in any particular geographic area.

Despite the critical role played by MTA in development of the sector, it no longer has the resource and mandate to undertake extensive geothermal exploration drilling, particularly in the central or eastern provinces, which remain largely unexplored and where geothermal surface manifestation exist. A significant share of the geothermal market expansion to come is in those provinces. Moreover, 72% of 1,799 active geothermal exploration licenses have been issued to the private sector since 2007, with no substantial increase in exploration activities. The significant slowdown in new geothermal exploration activities is due to the following factors:

- a) Inappropriate risk allocation - Since MTA has very limited additional geothermal

exploration activities planned, the entire exploration risks in licensed areas that have received little or no previous investments by MTA are now to be taken on fully by the private license holders. However, except for a few of them, many of the exploration license holders have limited technical/geological expertise and financial capacity for taking on such risks. License holders are expected to take on significant capital expenditures and exploration risks that cannot be commercially mitigated since no financing is usually available for the early phases of geothermal development. Yet this initial investment is the only way to confirm the presence of a source of geothermal energy and validate its commerciality (i.e. a level of productivity measured as MW of energy per well sufficient to ensure a positive return on investment).

b) Lack of commercial debt financing - Due to the above mentioned risk profile, no commercial debt or equity is available to finance the exploratory or resource development phases (see box 1 below) and, worldwide, developers rely on their own equity. The same is true for the geothermal market in Turkey, where commercial financing is often only available after power plant construction and onward, except in the rare instances when retroactive finance of some production/capacity drilling expenditures has been provided. For instance, it is not uncommon for project developers to finance 40 - 50% of total capital expenditure of a geothermal power plant before having access to any kind of commercial financing. The developer's own equity capital is then immobilized and at risk for 4-5 years before any cash flow can be generated from sales of electricity. With little support for the riskiest stage of the project development, many exploration license holders are not able to complete the exploration stage.

II. Proposed Development Objectives

The Project Development Objective is to scale up private sector investment in geothermal energy development in Turkey.

III. Project Description

Component Name

Risk Sharing Mechanism for Resource Validation

Comments (optional)

This component aims to promote private sector development of geothermal energy projects in the early stage exploratory and confirmation drilling stages by sharing the risk of failing to validate a geothermal resource among two parties: the administrator of a Risk Sharing Mechanism (RSM), capitalized by a CTF contingent recovery grant, and the geothermal developer. In case a well fails to yield outputs at a pre-agreed level of well productivity, the RSM will cover a pre-defined percentage of the drilling expenditures.

This component also includes a technical assistance component for (i) capacity strengthening of the geothermal team at TKB and (ii) consultancy support to TKB to facilitate implementation of the RSM.

Component Name

Loan Facility for Resource Development

Comments (optional)

This component aims to address the financing gap that license holders face today in the resource development stages of geothermal project development by providing debt financing to encourage and support both license holders and financiers investing in (i) the capacity/production drilling stage and (ii) the steam gathering and power plant construction stage. The Project will capitalize a credit

line to financial intermediaries (FIs) with an IBRD loan, which will be co-financed with FIs' own resources. The FIs (TKB and TSKB) will on-lend at market rates, but offer longer tenors than currently available in the market, to geothermal developers at the capacity drilling stage and at the construction stage.

IV. Financing (in USD Million)

Total Project Cost:	352.30	Total Bank Financing:	250.00
Financing Gap:	0.00		
For Loans/Credits/Others			Amount
Borrower			62.50
International Bank for Reconstruction and Development			250.00
Clean Technology Fund			39.80
Total			352.30

V. Implementation

On behalf of the Republic of Turkey, the Development Bank of Turkey (TKB) will assume overall implementation and fiduciary responsibility for the implementation of Component 1. TKB will provide adequate budgeting, personnel and other necessary resources throughout the implementation of the entire RSM period in order to ensure continuity.

A consultant firm (RSM consultant) will be hired to provide support to TKB in implementing and managing the RSM. The RSM consultant will carry its work on behalf of TKB and under its supervision. The consultant will be required to provide specialized financial and geothermal expertise to the RSM, specifically regarding the assessment of the corporate, financial and technical eligibility of applicants, as well as the interpretation of surface exploration data and conceptual models presented, proposed drilling and testing plans and protocols, assessments of development and business plans, and monitoring and reporting of all activities undertaken by the selected beneficiaries.

TSKB and TKB have been identified as the Financial Intermediary (FIs) that will implement of Component 2. Both of them have adequate experience and capacity to implement and take on the risk associated with the capacity drilling activities to be supported by the project. This is based on their technical strength, track record in renewable energy development and significant experience in implementing national and World Bank policies in environmental and social safeguards. TKB and TSKB have the required fiduciary capacity and experience in renewable energy projects and acting as a FIs for World Bank projects.

VI. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	x	
Natural Habitats OP/BP 4.04	x	
Forests OP/BP 4.36		x
Pest Management OP 4.09		x
Physical Cultural Resources OP/BP 4.11		x

Indigenous Peoples OP/BP 4.10		x
Involuntary Resettlement OP/BP 4.12	x	
Safety of Dams OP/BP 4.37		x
Projects on International Waterways OP/BP 7.50		x
Projects in Disputed Areas OP/BP 7.60		x

Comments (optional)**VII. Contact point****World Bank**

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