

# Request for Expression of Interest (EoI) for the Second Round of Geothermal Exploration Risk Sharing Mechanism (RSM)

## RISK SHARING MECHANISM (RSM) FOR GEOTHERMAL RESOURCE VALIDATION IN TURKEY

### Türkiye Kalkınma ve Yatırım Bankası A.Ş. (TKYB)

#### Introduction

Geothermal exploration and development are high-risk investments, due to high capital expenditures for drilling and uncertainty associated with natural resources for geothermal utilization. General Directorate of Mineral Research and Exploration of Turkey (MTA) has limited its exploration and license tendering activities and private investors must now finance 100% of the exploratory risk after acquiring rights to the license area. Like many other countries, commercial financing is generally not available in Turkey until the geothermal resource has been validated and construction of the power plant or direct use facility has commenced.

Therefore, the objective of the RSM project is to **increase private sector investment in geothermal exploration drilling in Turkey by providing partial coverage of exploration drilling costs in case of unsuccessful wells**. Funding of projects under RSM will be provided by a contingent grant from the Clean Technology Fund (CTF) to the Government of Turkey. It is expected that a total of 21 million USD will be available for exploration drilling projects under RSM for this second request for an expression of interest (EoI). The implementing agency is a dedicated RSM Unit called the RSM Project Implementation Unit (PIU) within the Development and Investment Bank of Turkey (TKYB).

Within the scope of RSM, once the Beneficiary is successfully enrolled in the RSM program:

- 40% to 60% of the cost of unsuccessful wells will be paid by the RSM to the Beneficiary up to a total of \$4 million under a scheduled drilling program.
- If two wells in a three well program are unsuccessful, the contract between the RSM and the Beneficiary is automatically terminated.
- Higher coverage will be given for wells outside the Aydın, Denizli and Manisa,<sup>1</sup> where geothermal explorations are less advanced.

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<sup>1</sup> All three provinces, Manisa, Aydın and Denizli have only been partially covered with geothermal explorations. Therefore, projects in regions outside the already explored geothermal basins, will qualify for 60% coverage for the first three wells in the drilling programme, as elsewhere in Turkey. The five districts that qualify for 40% coverage in Manisa are Ahmetli, Gölarmara, Salihli, Alaşehir, Sarıgöl. The twelve districts that qualify for 40% coverage in Aydın are Söke, Germencik, İncirliova, Koçarlı, Karpuzlu, Aydın Merkez, Köşk, Yenipazar, Sultanhisar, Nazılı, Buharkent, Kuyucak. The six districts that qualify for 40% coverage in Denizli are Buldan, Sarayköy, Pamukkale, Babadağ, Merkezefendi, Serinhisar.

- The Beneficiary will pay a 5% “Success Fee” of the actual acceptable well costs (AWC) only when the well is successful.
- Before signing the Beneficiary Agreement, a success fee for each well under the RSM program equivalent to 5% of the estimated well cost is either paid upfront by the Beneficiary to the RSM or provided for through a letter of financial guarantee.
- When a completed well meets or exceeds the success criteria that has been set on a custom basis for the drilling program, the success fee is retained by the RSM. If the well is not successful, the success fee is reimbursed to the Beneficiary.

A standard RSM program will consider drilling costs of three wells per project, but the program can be extended to a fourth and a fifth well at a lower coverage (40% of the investment costs in all cases) and higher success fee (10%). The exploration wells to be supported by the RSM can be production-size, medium size or slim wells, as dictated by the drilling program necessary to meet the requirements of the supporting business plan. Realistic success criteria will be based on geoscientific information and need to be consistent with the accompanying business plan. The success criteria will be subject to negotiations between the Beneficiary and the RSM PIU during contract negotiations before drilling starts.

## Background

Maximizing utilization of domestic primary energy resources and securing sufficient, reliable and affordable energy to a growing economy in an environmentally sustainable manner has been, and remains, the Turkish government’s core energy policy priority.

Besides the enhanced regulatory framework by the Turkish government over the last decade, exploration activities conducted by the MTA have been a critical driver behind geothermal development in Turkey. Until 2007 MTA was responsible for the exploration and mapping of geothermal resources in Turkey and has traditionally been the main institution advancing the development of geothermal utilization. Out of a total of 190 geothermal sites discovered, MTA prioritized 25 sites which were considered suitable for electricity production, whereas other sites were suitable for direct use applications. At the end of July 2020, geothermal electricity generation capacity in the country had reached a total of 1,515 MWe, whereas direct use installed capacity amounted to around 3,500 MWth, divided over around 1,600 MWth hotels and SPAs, around 1,000 MWth district heating, around 800 MWth greenhouse heating and 100 MWth for other uses.<sup>2</sup> The vast majority of current geothermal power plants are located in the Aydin, Denizli and Manisa provinces, whereas direct use of geothermal is more evenly spread over Turkey. Most of these sites were initially explored by MTA after which the resource risk was largely mitigated with additional drilling. As of 2007, MTA no longer has the required resources or the mandate to undertake extensive geothermal exploration drilling. Moreover, 72% of 1,799 active geothermal exploration licenses have been issued to the private sector with no substantial increase in exploration activities. The significant slowdown in new geothermal exploration activities is primarily due to the high risk of exploration drilling being shifted from the MTA onto the private investor. This situation is further compounded when commercial debt is generally not available to the private investor until the geothermal resource has been validated through exploratory drilling.

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<sup>2</sup> See <http://www.jeotermaldernegi.org.tr/sayfalar-Turkiye-de-Jeotermal>

The RSM aims to facilitate private sector investment in geothermal exploration projects for electricity generation and direct uses in Turkey. The program consists of a mechanism through which the developer's exploratory drilling cost is substantially reduced in the event of an exploratory drilling failure.

### Objective of the Risk Sharing Mechanism

The objective of the RSM is to increase private sector investment in geothermal exploration drilling in Turkey. This will be done by providing reimbursement of a percentage of the private investor's exploratory drilling costs when a well is judged as unsuccessful based on preset conditions that are established in line with the developer's business plan for the resource.

The goal is to be achieved by reducing the financial risk of exploration drilling projects in greenfield areas. In this context, an exploration drilling project is defined as the drilling of one or more wells in each geothermal site in order to validate the viability of power production, and/or direct use application, and/or thermal gradient at that site.

### Expression of interest

The RSM PIU within the Development and Investment Bank of Turkey is now asking for an expression of interest (EoI) from potential Beneficiaries who wish to participate in the RSM for exploratory drilling.

In the second RSM round the applicant's EoI must demonstrate that the applicant can qualify for RSM Program participation and enter into a Beneficiary Agreement (BA). Demonstration of the applicant's geothermal program and general qualifications will be achieved by answering the questions and providing the requested data (to the greatest extent possible) as specified in the EoI Template. Applicants are encouraged to provide any relevant information in addition to that which is identified in the EoI Template to help assure being shortlisted. Generally speaking, successful applicants will need to demonstrate that they will fulfil the following qualification criteria as further identified in the EoI Template.

1. Hold a valid exploration license.
2. Have finished surface exploration, including geological, geophysical, and geochemical exploration.
3. Have constructed initial Conceptual Geothermal System Model (simple or extensive)
4. Have selected drilling targets (depth, flow rate, temperatures), well types (shallow/deep and vertical/directional) and conceptual well design.
5. Have prepared a business plan.

As environmentally sustainable geothermal utilization is one of the key objectives of future geothermal development, expected CO<sub>2</sub> emissions from successful wells need to be below grid emission factor of 540 g CO<sub>2</sub>/kWh.<sup>3</sup>

The EoI should contain the following information:

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<sup>3</sup> In the case where only very short-term flow testing (couple of days) reveals higher CO<sub>2</sub> output, it has to be estimated how likely it is that such results are representative for the long-term emission. It is known that CO<sub>2</sub> output can be very high initially, but often decreases rapidly. Therefore, initial CO<sub>2</sub> estimates should be taken provisionally, unless long-term (few weeks) flow testing is possible.

- Geothermal – technical:
  - Conceptual model (see 3. above, which is based on 2. above) and list of data behind the conceptual model.
  - Drilling plan (see 4. Above)
  - References demonstrating previous drilling experience and CVs of key experts.
  - If there are already exploration wells, provide an indication of the information from these wells.
- Business Plan:
  - The structure of the Beneficiary's consortium or Joint Venture: description of the Beneficiary.
    - Here submission of financial statements of the past 3-5 years are requested, namely balance sheets, profit/loss statements and income statements.
    - This should be submitted for the aimed at special purpose entity and the group this belongs to.
  - Feasibility of the drilling plan for direct use facilities or power plants, this should include the following data:
    - Target output per well in  $MW_{th}$  for direct use and  $MW_e$  for power production.
    - Proximity to other present or planned geothermal exploration wells.
    - Number of production and number of reinjection wells aimed at.
    - Number of wells under RSM aimed at.
    - Average investment cost per well.
    - Total investment cost of power plant or direct use facility.
    - Operating costs.
    - Average sales price for the first 10 years and from year 11 onwards.
    - Percentage of equity to be committed to total investment costs.
    - Expected IRR and NPV (at 8% discount rate).
  - If any pre-feasibility study or socio-economic analysis are available, applicant should provide final reports.
- Safeguards:
  - Environmental issues:
    - Information on project status with respect to Annex II of the Turkish Environmental Impact Assessment Regulations (Official Gazette Date: 25/11/2014 No. 29186l) and classified as Category B Project under World Bank Environmental and Social Safeguard Policies.
    - Proximity to sites of cultural heritage.
    - Proximity to protected areas/sensitive habitats with respect to national and international standards.
    - Proximity to settlements (residential, commercial, and public).
    - Proximity to water bodies, irrigation structures and designated water supply zones for groundwater and surface water.
  - Social issues:
    - Land use status in relation to land based livelihoods; use for agricultural purposes etc.

- Land acquisition needs (whether voluntary purchase or expropriation will be sought).
- Current and recent use of the land by project affected people and communities.

Call for Expression of Interest will also be published on the dedicated websites, where also a template Eol form and the TKYB form will be available:

<http://rsmgeoturkey.com> (English version)

<http://rpmjeoturkiye.com> (Turkish version)

Best regards,

TKYB's RSM PIU