GEORISK INTERNATIONAL WEBINAR: THE RIGHT RISK MITIGATION SCHEME FOR MY GEOTHERMAL MARKET

DEVELOPMENT AND INVESTMENT BANK OF TURKEY

LESSONS LEARNT FROM THE TURKISH FUND (RISK SHARING MECHANISM)
OUTLINE

- Geothermal Risk Sharing Mechanism in Turkey (RSM-Turkey)- General conditions, Background and Rational
- RSM Program definition, processes and phases
- RSM Progress Updates for both rounds
- Lessons learnt from RSM first round, feedbacks received from applicants and their evaluations
- How was RSM be improved in the second round depending on the feedbacks from first round?
- How will RSM experience be shared with target countries of Georisk Project?
GEOTHERMAL SUPPORT MECHANISMS IN TURKEY: BACKGROUND

➢ In line with its target of developing geothermal energy, the Government of Turkey has put in place a supportive legal framework to facilitate this 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 licensing procedures were also clarified under the law.

➢ In summary, there are two main mechanism to develop the national geothermal resources in Turkey; one of them is selling price guarantee (FIT mechanism) for the power plant projects and the second one is Risk Sharing Mechanism (RSM) to mitigate the exploration and confirmation drilling stages risks for power plant and also heating projects.
1. **RISK SHARING MECHANISM (RSM):**

- Geothermal Development Project was started with the agreement signed with TKYB and World Bank on November 2016 to scale up private sector investments in geothermal energy in Turkey. The objective will be achieved by reducing the risks taken on by the private sector to validate geothermal resources in the early exploratory phases, and by providing access to long-term financing to develop geothermal resources.

- The Project has two components:
  
  Component 1, to establish a Risk Sharing Mechanism for Resource Validation (RSM), to support the exploration and confirmation drilling stages.

  Component 2, to set up a Loan Facility for Resource Development to provide financing to the resource development stage and to the power plant development phase.
2. FEED IN TARIFF

➢ In 2011 an amendment to the Renewable Energy Law provided a feed-in tariff of 10.5 USD cents per kWh for geothermal power, for 10 years period with an additional up to 2.7 USD cents per kWh to reward the use of locally produced equipment for 5 years period from the commissioning date. Under the Renewable Energy Support Mechanism (YEKDEM), Turkey offers feed-in tariffs for renewable power plants, including wind, solar, biomass, hydro and geothermal. Additional support is provided if plant components are manufactured in Turkey. The scheme expired at the end of 2020 and the new mechanism was introduced on January 2021.

➢ According to new FIT which was published from Ministry of Energy and Natural Resources (MENR) dated 29/01/2021, FIT has been changed to 54 TL kr/kWh price for 10 years period with an additional up to 8 TL kr/kWh to reward the use of locally produced equipment for 5 years period from the commissioning date. The new FITs will be valid for projects realized between 01/07/2021 and 31/12/2025.

➢ This Law covers the financial and economic risks of renewable energy investments with ‘renewable energy sources supporting mechanism’ which provides selling and price guarantee to the generated electricity.

<table>
<thead>
<tr>
<th>(USD.cents)</th>
<th>Base Fee</th>
<th>Local Equipment Bonus(for 5 years)</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Old Tariff</td>
<td>10.5</td>
<td>2.7</td>
<td>13.2</td>
</tr>
<tr>
<td>New Tariff</td>
<td>6.35</td>
<td>0.95</td>
<td>7.3</td>
</tr>
<tr>
<td>Change</td>
<td>-40%</td>
<td>-65%</td>
<td>-45%</td>
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The RSM has been capitalized with a contingent grant from the Clean Technology Fund (CTF) by World Bank to the Government of Turkey. TKYB is responsible for implementing the Project. The program consists of a mechanism through which the developer’s exploratory drilling cost will be covered in a pre-defined percentage of actual acceptable well cost (i.e. Eligible drilling expenditures) incurred by the license holder in the case of an unsuccessful well.

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 ‘drilling of one or more wells in a given geothermal reservoir in order to validate the viability of power production, and/or direct use application, at that site’.
RISK SHARING MECHANISM (RSM) PROGRAM DEFINITIONS AND PROCESSES

RSM FLOW DIAGRAM

- WORLD BANK
- CLEAN TECHNOLOGY FUND (CTF)

Finance

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Beneficiary Agreement

BENEFICIARIES

Implementing Agency

RSM IMPLEMENTATION UNIT

MONITORING & SUPERVISING

REPORTING

MONITORING

RSM CONSULTANT
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 according to RSM Implementation Unit’s decision.

Regardless of the coverage ratio of the three wells being 60% or 40%, if wells 4 and 5 are drilled, the RSM coverage ratio will be 40% for each.

If the wells within the scope of the RSM are successful, a 5% success fee that is calculated on acceptable well cost will be received. For the 4th and 5th wells under RSM, the success fee is calculated as 10% of the acceptable well costs.

The maximum pay-out from the RSM for a single project will be capped at USD 4 million.

CO2 concentration in fluid of any well will result in emission levels more than the value of the year prior to the year when the drilling was completed

RSM program will be terminated if 2 wells within the scope of the Program are unsuccessful.
**RISK SHARING MECHANISM (RSM) PROGRAM DEFINITIONS AND PROCESSES**

**RSM PARTIAL COVERAGE RATES:**

Partial Coverage Rate is the percentage of actual acceptable well cost (i.e. Eligible drilling expenditures) incurred by the license holder in the case of an unsuccessful well.

- Applications made from some certain districts in Aydın, Manisa and Denizli provinces can benefit from RSM by 40%
- Applications made from all other districts in Aydın, Manisa and Denizli provinces can benefit from RSM by 60%
- All other districts throughout Turkey can benefit from RSM by 60%
RSM IMPLEMENTATION PROCESSES

* 540 gr/kWh is the national marginal emission factor based on renewable resources (without wind and solar) which was published on Sep.2020
RSM PROGRAM IMPLEMENTATION PERIODS

**Period-1**
- **Documentation, Process development**
  - Introduction of the Project to Stakeholders: Project Introductory Workshop (July/2018)
  - Preparation of Project web-site: www.rpmjeoturkiye.com
  - Preparation of the RSM database

**Period-2A**
- **Receiving applications**
  - Technical, environmental and social evaluation of applications
  - Scoring
  - Potential projects list for the first round
  - Informing the applicants on the first round scoring results

**Period-2B**
- **Negotiating with Potential Beneficiaries**
  - Determination of success criteria
  - Revised Business Plan and Environmental-Social documents
  - Signing Beneficiary Agreement between TKYB and Beneficiaries

**Period-3**
- **Drilling and Well Testing**
  - Drilling plans implemented
  - Well testing protocols implemented
  - Site visit, monitoring and data collection

**Period-4**
- **Reporting**
  - Preparing the Evaluation Report of each phases
  - Preparing quarterly and annual reports
RSM PROGRESS UPDATES FOR BOTH ROUNDS

First Round

- RSM Program Starting Date: Feb/2018; RSM Program Closing Date: Dec/2022
- Preparation and Application Periods of RSM First Round are completed.
- Total 21 projects received (one of them is heating and all others are power generation projects)
- All applications evaluated and scored, 7 projects were selected as potential beneficiaries of the RSM first round
  - 4 of them are located in the 60% RSM coverage region and 3 of them are in the 40% RSM coverage region
  - Total 18 exploration wells are covered in RSM first round and total expected power plant capacity is 101.5 MW
  - RSM first round maximum pay-out potential is 15.6 M$
  - Negotiation period of six projects are completed and Beneficiary Agreement has signed with 3 of them
  - Drilling activities and site preparations are already ongoing for 2 projects in Niğde Province.
  - 4 of projects under the first round, the court cases about E&S issues are ongoing in Manisa Province.
RSM PROGRESS UPDATES FOR BOTH ROUNDS

Second Round

- Held on a Consultation Workshop for 2nd Round on 26th January, 2021
- Completed Expression of Interest (EOI) stage and 18 EOIs have received until 12th March, 2021
- Held on 2 days training for shortlisted EOIs on 20-21 April, 2021
- Completed Full Application stage and total 14 application have received until 3th June, 2021
- Evaluation of full applications are going on.
- 2 projects from 40% regions and other 12 projects from 60% regions
- 3 projects for direct use (district heating), 8 projects for power generation and 3 projects for power and heat (integrated projects)
LESSONS LEARNED FROM FIRST ROUND

- Defining the success criteria is the most crucial point of risk sharing.
- During the first round of RSM Project implementation, the Project Calendar had a 12-month delay. Delays experienced in the first round were mainly related to evaluation process and fulfilment of safeguards requirements.

  Evaluation Process:
  a) Significant amount of time was spent on evaluating applications that did not fulfill requirements.
  b) It took several iterations to formulate the presentation of the evaluation results in the final evaluation report of the RSM Consultant.

  Safeguard Issues:
  a) None of the RSM applications completely fulfilled the safeguard requirements at the time of application.
  b) TKYB and RSM Consultant team spent a lot of time to finalize and standardize the safeguard reports of the applicants.
LESSONS LEARNT FROM FIRST ROUND

- Among the 7 shortlisted beneficiaries in first round, 4 of the projects are based in Manisa Province. The progress is less than expected for these projects due to ongoing court cases against “EIA not required” or “EIA positive” decisions received by beneficiaries. Manisa Administrative Court cancelled many “EIA not Required” decisions.

- Due to the court decisions and ongoing court cases, it is not possible to precisely determine the timeline for the implementation of these projects, which is one of the main challenges associated with these 4 projects.

- Since the drilling activities could not have been started for these four projects due to the abovementioned reasons, the budget allocated for first round may not be fully utilized or may be allocated to second round (or forthcoming rounds).

- For the 2 projects based in Niğde, there are no administrative or legal barriers or challenges for the implementation of the projects. Drilling activities/preparations are already ongoing for these projects.

- Based on these experiences in first round, The RSM coverage rate for the districts, where there is a huge resistance/prejudice against Geothermal projects with many court cases, can be lowered. They can even be removed from the scope of the projects.
FEEDBACKS RECEIVED FROM APPLICANTS AND THEIR EVALUATIONS

A Questionnaire was prepared to get feedbacks from the applicants;

- Questionnaire included 22 different questions related to application and evaluation processes, drilling and well design requirements, business plans and E&S management plans
- 6 feedbacks were received from applicants and evaluated
- The concentration were on the difficulties of meeting the E&S conditions and well testing requirements and on the business plan criteria
- Uncertainty over the selling price of electricity and the Feed in Tariff (FIT) mechanism for the future years, difficulties met in receiving environmental permits were other issues raised but these are general for all geothermal developers.
<table>
<thead>
<tr>
<th>Main Issues/ Period</th>
<th>Original- 1st Round</th>
<th>Revised- 2nd Round</th>
<th>Resolve of the Bottleneck</th>
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| Application Period of Developers | There was no shortlisting during the Expression of Interest (EoI) round. The proposals were submitted by any developers interested in the RSM program                                                                                                                                                                                                 | Develop Request for Expressions of Interest (EoI) in order to prepare a shortlist of interested developers for the second RSM round                                                                                                                                                                                                 | 1. Well prepared applications of more competent developers  
2. Avoid delays caused as a result of dealing with less qualified applications |
| Hold a Consultation Workshop | No Consultation workshop was organized in RSM round 1                                                                                                                                                                                                                                                                                               | Prior to the launch of the call for EoI, a 1-day Consultation Workshop will be held. This will provide feedback on the interest in RSM round 2, to tailor the process to applicant’s needs to the extent possible. | 1. Obtain feedback from applicants early on to tailor the RSM.  
2. Avoid delays caused as a result of less qualified applications |
| Hold Application Workshops | Except for a one-day application workshop prior to opening the application period, no additional support was provided to the developer to prepare the required application documents                                                                                                                                                                                                                                           | A two-day application workshop will be held. One day will focus on the technical and financial application requirements, while the second day will focus strictly on E&S requirements. Due to shortlisting after EoI submission, developers will be trained first and if needed follow up meetings will be held when they are preparing their application files, to assure that the information gathered in the applications are more comprehensive. | 1. Support to be provided to developers  
2. Provide understanding of the RSM program requirements to developers, especially E&S issues  
3. Provides for an easier evaluation process and possibly more reliable evaluation results |
### How Was RSM Be Improved in the Second Round Depending on the Lessons Learnt from Firsts Round?

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<td><strong>RSM Coverage</strong></td>
<td>RSM coverage included drilling related costs</td>
<td>RSM coverage included drilling related costs and <strong>surface exploration costs (just for 60% coverage regions)</strong> and <strong>also air-lifting and pump testing costs</strong> if they are needed during flow test</td>
<td>More coverage is expected to increase interest in the program, particularly for areas outside Gediz and B. Menderes Grabens</td>
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<td><strong>RSM Success Fee</strong></td>
<td>If the wells within the scope of the RSM are successful, a <strong>10%</strong> success fee that is calculated on acceptable well cost will be received. For the 4th and 5th wells under RPM, the success fee is calculated as <strong>25%</strong> of the acceptable well costs.</td>
<td>If the wells within the scope of the RSM are successful, a <strong>5%</strong> success fee that is calculated on acceptable well cost will be received. For the 4th and 5th wells under RPM, the success fee is calculated as <strong>10%</strong> of the acceptable well costs.</td>
<td>Expected to increase interest in the program</td>
</tr>
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<td><strong>E&amp;S Aspects of Application</strong></td>
<td>There was an evaluation of the E&amp;S aspects of the proposed project during the application processes, but no points were giving related to how applicants dealt with E&amp;S issues</td>
<td>E&amp;S activities such as securing the EIA document, holding public consultation meeting should be done as early as possible. <strong>Applications readily having done these will be scored higher in evaluation process.</strong></td>
<td>1. Provides for an easier evaluation process and possibly more reliable evaluation results 2. Avoid delays caused by E&amp;S issues</td>
</tr>
<tr>
<td><strong>Business Plan template for all applicants</strong></td>
<td>There was no template or standardized Business Plan criteria that was to be used in preparing a proposal in the first application round</td>
<td><strong>Key financial parameters such as, IRR, discount rate, loan term and percentage, equity can be identified</strong> at the beginning of the application process</td>
<td>1. Provide standardized business plan for all applicants 2. Easy to compare and evaluate of all applicants’ business plans</td>
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### HOW WAS RSM BE IMPROVED IN THE SECOND ROUND DEPENDING ON THE LESSONS LEARNT FROM FIRSTS ROUND?

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| **Business plan template for direct-use and power-plant developers specifically** | There was no template or standardized criteria which the Business Plan was required to use in preparing applications | Develop new template of business plan | 1. Provide standardized business plan  
2. Support to be provided to direct-use and power-plant developers |
| **Specific measures or requirements for direct-use projects** | There were no specific measures regarding direct-use projects which had to be met to be eligible for the RSM | The RSM consultant developed specific measures or requirements for direct-use projects:  
- surface exploration costs become part of acceptable well cost (AWC),  
- additional surface exploration studies to be suggested after shortlisting to improve quality of the application | 1. Additional support to be provided to direct-use beneficiaries |
| **Use of pump testing for determining well output success criteria** | Success Criteria requires pump testing for estimating well output when self-flow is not sufficient. | If self-flow from wells is not sufficient to meet the Success Criteria, well testing shall be carried out. Airlifting will be a prerequisite for estimating the long term well output. If possible, pump tests for long-term output estimation will be preferred | 1. Objection of pump testing by Beneficiaries will be solved by airlifting requirement, which is cheaper, but somewhat less conclusive.  
2. The conditions of pump testing/airlifting requirement is defined  
3. The costs incurred during this testing will be included in AWC |
HOW WAS RSM BE IMPROVED IN THE SECOND ROUND DEPENDING ON THE LESSONS LEARNT FROM FIRSTS ROUND?

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<td>Monitoring of Drilling Activities</td>
<td>There was no schedule prepared or used to monitor programmed drilling activities</td>
<td>Monitoring schedule of the RSM Consultant is determined and this will include both technical and E&amp;S and OHS issues.</td>
<td>Providing monitoring feedback and support during the drilling activities by regular site visits.</td>
</tr>
</tbody>
</table>
| E&S and OHS Monitoring               | There was no E&S milestone schedule prepared by the short-listed beneficiaries that could be used to monitor required E&S activities | E&S monitoring schedule of the RSM Consultant is determined for short-listed beneficiaries in order to monitor completion of E&S and OHS issues required activities during program implementation | 1. Support to be provided by the RSM Consultants on E&S and OHS requirements under Turkish Law and World Bank Safeguard Guidelines  
2. Provide support by the RSM Consultant to easily understand and solve the problems related to E&S and OHS issues during implementation period of the projects |
| CO2 Emission                         | Measured CO2 concentration of the wells within the scope of the RSM must be lower than 583 gr/kWh. RSM program will be terminated if CO2 concentration of the well give higher values. | RSM agreement will be terminated if CO2 emission levels are the value of the year prior to the year when the drilling was completed. For 2nd round projects, 540 gr/kWh which is the CO2 emission factor, published by MENR will be used | The CO2 factor has decreased from round 1 to round 2 |
HOW WILL RSM EXPERIENCE BE SHARED WITH TARGET COUNTRIES OF GEORISK PROJECT?

- Doing a benchmark of current status of geothermal markets, regulations and geothermal risk mitigation schemes (if exist) between the Georisk target countries and Turkey

- Preparing the SWOT Analysis of Georisk target countries’ geothermal risk mitigation schemes to identify the main risks and how will their risk mitigation scheme be improved

- Documentation and standardization of Georisk target countries’ risk mitigation scheme are crucial for applicants to understand their methods and implementation processes

- As environmental and social issues and permits are very important to avoid delay in geothermal exploration activities and affects the risk mitigation program, a brief study can be conducted to elaborate the current environmental legislation of the target country.
THANK YOU

CONTACT

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