Gumuskoy Geothermal PP, Turkey

First Geothermal Dialogue
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Why is Gumuskoy GPP interesting

Development and Financing model

• Heavy exploration and development risk appetite from developer

• Public-private financing

<table>
<thead>
<tr>
<th></th>
<th>Debt</th>
<th>Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EBRD MidSEFF</strong></td>
<td>Loan Public</td>
<td>24.9 50%</td>
</tr>
<tr>
<td><strong>Yapikredi</strong></td>
<td>Lease Finance Private</td>
<td>9.6 20%</td>
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<tr>
<td><strong>BM Holding</strong></td>
<td>Equity Private</td>
<td>15.1 30.0%</td>
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<tr>
<td><strong>Total Project Cost</strong></td>
<td></td>
<td>49.6</td>
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Context for the Project

Policy and regulatory changes

- 2007 Geothermal law
- 2010 Renewable Energy law amendment

Project Timeline

2006: Exploration Licence
2010: Operation Licence
April 2012: Financial Close

2006-2009: Exploration
2010 - 2012: Resource Development
April 2012 - 2013: Commercial Drilling and Construction
Nov 2013: 1st unit commissioned
Mar 2014: 2nd unit commissioned
Gumuskoy GPP: Role of public finance
# Risk Allocation and Mitigation

<table>
<thead>
<tr>
<th>Exploration</th>
<th>Development</th>
<th>Operation</th>
<th>Outcome</th>
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<tbody>
<tr>
<td><strong>Turkey Govt</strong></td>
<td><strong>Lenders</strong></td>
<td><strong>Developer</strong></td>
<td><strong>Contractors</strong></td>
</tr>
<tr>
<td>Resource risk</td>
<td>Drilling risk</td>
<td>Financing Risk</td>
<td>Construction risk</td>
</tr>
<tr>
<td>Price Risk</td>
<td>Loan Risk</td>
<td>Resource risk</td>
<td>Turbine performance</td>
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<td>Carbon leakage</td>
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**Risk Categories:**
- Resource risk
- Drilling risk
- Financing Risk
- Construction risk
- Price Risk
- Loan Risk
- Resource risk
- Turbine performance
- Carbon leakage
Gumuskyo GPP: Early Takeaways

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Responses/Results</th>
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<tbody>
<tr>
<td>• Private-sector risk appetite for exploration</td>
<td>• Transferable skills/knowledge base to manage risk</td>
</tr>
<tr>
<td>• Provide certainty to cover cost of risk capital</td>
<td>• 10 year FIT plus high equity IRR</td>
</tr>
<tr>
<td>• Access to debt capital at suitable rate and tenor</td>
<td>• 2-3 year longer tenor at 200-250bps cheaper cost of capital</td>
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Gumuskoy GPP: Early questions for policy

- Managing carbon leakage risk
- Encouraging significant private activity vs limited role in policy targets

Beyond Turkey – can private sector take exp. risks
- Transferability of existing drilling and geological resource management skills/knowledge in-country
- Identifying private sector capability/appetite
- Identifying local banks to channel public finance
Thank you!
Questions for Discussion

- What are the implications for private sector exploration model for growth of geothermal in Turkey?
- What are the technology and financing challenges of medium-enthalpy binary plants?
- What is the role of international development finance for ensuring project feasibility?
- Were all risks allocated to those best suited to manage them?
- How will future changes to regulations alter project development?
- What are Government's lessons from this type of project for their geothermal development strategy going forward?