

Third Geothermal Dialogue

Lessons on the Role of Public Finance in Geothermal Development

16 June 2015

Hofburg Redoutenstē
Josefsplatz, 1010 Vienna

A meeting organized by **Climate Policy Initiative**
in partnership with the **Climate Investment Funds**

Summary

On June 16, Climate Policy Initiative (CPI) and the Climate Investment Funds (CIF) held the Third Geothermal Dialogue in Vienna. The meeting was the one of **a series of three such events** bringing together representatives from development banks, governments, private project developers and financiers. CPI organized the meeting as part of a research program it is carrying out on behalf of the Climate Investment Funds with the aim of helping policymakers and donors understand how to cost-effectively support the scale up of geothermal energy deployment in developing and emerging countries. In particular, emphasis is placed on those financing and non-financing tools that can help encourage private investment in geothermal development.

CPI has already published a background paper and three case studies under this research program:

- [“The Role of Public Finance in Deploying Geothermal – Background Paper”](#)
- [“Public Finance and Private Exploration in Geothermal: Gümüşköy Case Study, Turkey”](#);
- [“Using Public Finance to Attract Private Investment in Geothermal: Olkaria III Case Study, Kenya”](#); and
- [“Using Private Finance to Accelerate Geothermal Deployment: Sarulla Geothermal Power Plant, Indonesia”](#).

The lessons learned from these case studies and during the dialogues will feed into the final research study of the series.

CPI case studies and discussions during the previous dialogues held in [Copenhagen](#) and [Munich](#) highlighted that both the risks involved in the exploration and drilling phases of projects and the upfront costs are high for private sector actors to take on, particularly in developing countries. Participants in the Third Geothermal Dialogue discussed why and in which circumstances public support is required to enable geothermal scale up. This summary highlights the key points made during the discussions.

- **Public sector support during the early stages of development is critical to catalyze private investments. No country has yet managed to harness its geothermal potential without public support.** Governments' leadership in providing certainty on the availability of geothermal resources as well as access to instruments aligned with the requirements of the different stages of geothermal development is critical to ensure the viability of investments and thereby attract project developers. Debt financing may not be compatible with the risk/reward profile of the investment in the early exploration and production drilling phases of projects. Other publicly provided or backed instruments

such as contingent grants, equity, or insurance could be more effective in shifting risks or driving increased investment.

- **Data sharing, standards and quality control mechanisms could help to more efficiently scale up public and private investment in the sector.** Enhanced data sharing from both public and private stakeholders on the results of exploration and drilling activities and the related costs, ideally through an open database, could help to reduce barriers to entry to private developers and improve the design of financing mechanisms. Standards for site licensing and permitting could help to reduce developers' transactions costs. Quality control mechanisms could encourage lending by ensuring that financiers have accurate information with which to appraise the repayment capacity of projects.
- **Reductions in exploration and drilling costs, which typically account between 40 and 50% of total project costs, can enable greater private involvement in geothermal.** In more mature markets such as Turkey, competition between private actors has driven substantial reduction in drilling costs, thus facilitating private actors' access at earlier stages of geothermal development. In less mature markets, instead, an increased use of slim-holes instead of production wells could help to get data on the resource availability at lower costs. Developing smaller plants or adopting multi-stage development approaches could also reduce costs.
- **Market size matters in attracting project developers, particularly in countries with no or limited experience. International public support can help Small Island States to create the conditions for that to happen.** For Small Island Developing States such as Saint Lucia or Dominica geothermal represents an opportunity for reducing the heavy reliance on expensive, imported petroleum products for power generation and the high costs of electricity. Nevertheless, these countries face specific challenges to geothermal development including: lower attractiveness to qualified project developers than bigger markets; small scale energy networks with limited ability to absorb geothermal capacity; limited scope for economies of scale in infrastructure development; and very limited capacity given that they are making their first steps in this sector. International public support can help develop local technical capacity and gather data on geothermal potential in these countries. It can also help to shape the geothermal development path most suited to their context-specific circumstances, which will have to strike the balance between financial viability for project developers and affordability for the local government.
- **Many different development and financing models have been adopted for geothermal power development, even within a single country. The development of guidelines could help to explain under which circumstances a given model best applies.** Models range from public developer models (e.g., Costa Rica, El Salvador and Kenya) to fully private developer model (e.g. Chevron in the Philippines). Between these extremes there are various forms of public private partnerships (PPP) including joint ventures, approaches that share drilling costs, and energy conversion agreements. In purely public models, the challenge is to identify the right moment for the government to step back from the market and let the private sector take over. In PPP models, it is to clearly delineate responsibilities and risks allocation to avoid crowding out private investment or high costs for the public sector. The development of guidelines considering the circumstances under which various models best apply could help to inform countries seeking to cost-effectively harness their geothermal potential. These guidelines should consider countries' geothermal potential, technical and financial capabilities as well as status of deployment and development of the legal framework.
- **To enhance private participation in geothermal development, countries have to consider private sector involvement in their geothermal development strategies and setting of a realistic power tariff.** Some countries proved reluctant to involve the private sector in geothermal development for lack of trust, and, therefore, tended to opt for fully public

development models, thereby not considering in their strategies the design of instruments or approaches intended to attract private investors. Others have set power tariffs at levels that are too low to attract equity investment from private developers often due to lack of experience in determining geothermal levelized cost of electricity (LCOE). International public resources can assist these countries to design appropriate policy and investment frameworks.

- **Development banks have been the major provider of finance to geothermal projects in developing and emerging countries, but much more risk capital will be needed to achieve countries' deployment goals.**
 - CPI's case studies in Turkey, Indonesia and Kenya revealed that approximately 50%-60% of the project costs are covered with international public finance instruments such as loans or guarantees. In 66 other projects in developing countries, most international public finance also focused on the less risky construction and operation stages. More risk capital needs to be mobilised to achieve the geothermal deployment targets of developing countries (up to USD 13 billion in 12 countries)
 - Development banks can play a role in filling this gap by developing specific financing tools targeting those risks others investors are not willing to take. They can also support developing countries' governments to establish supportive regulatory frameworks; identify and share best practices in project development; and engage commercial banks in co-financing or on-lending in order to establish the conditions for private financing of projects.
- **Finance alone is not sufficient to support increased geothermal energy deployment. Technical assistance and policy dialogues are also important.** The availability of climate finance from international donors represents an opportunity to support the design and implementation of financial and non-financial instruments for geothermal development. It allows, for instance, development banks to blend investments with donor-funded technical assistance and policy dialogues that can strengthen local capacity and further enhance the attractiveness of geothermal markets to private investors.