
**GDF Latin America Foundation (GDF)
Technical Assistance Strategy and Recommendations**

A lunch with energy ministers from Latin America and their designates was organized in Santiago, Chile on July 18, 2019 during GEOLAC 2019 to reinforce GDF's (www.gdfiac.com) commitment to the strong belief in the potential of geothermal power in the target countries of the GDF for Latin America. After more than 3 years of operation, and based on four application cycles to GDF, we feel compelled to summarize experiences gained and the challenges perceived to a successful implementation of geothermal projects.

Since 2017, 53 projects have applied for GDF funding; 17 of those have been invited to grant negotiations. As a result of these efforts, six grants have been executed, out of which two have started development to date. Due to this demonstrated interest and pent-up demand, policy support for geothermal energy is key to develop utility-scale geothermal energy in Latin America.

The most striking concern we have is yet to see evidence in GDF countries of a policy that quantitatively values and meaningfully differentiates intermittent power from firm power in any form of request for proposal, auction or feed-in tariff structure. Considering that it is the ultimate goal of GDF to promote climate friendly electricity generation, GDF's concern is that the absence of these characteristics in national policies will result in unfavorable delays of geothermal development in the viable countries, and in the long term, may lead to challenges for countries' grid stability and cost to sustainably deliver power.

In order to better integrate intermittent renewable energies, GDF strongly encourages countries to pursue strategies such as firm power, intermittent power and power system flexibility measures in parallel. The GDF, its members and funders, are significant advocates for all forms of renewable energy and especially low-cost wind and solar. Yet, they must point out that wind and solar are only a partial solution in any country's successful sustainable energy strategy. Firm power (geothermal, hydro, biomass, solar plus batteries) could represent a material way to reduce the total cost to deliver climate friendly power including grid operation and service level requirements. While there are obvious similarities and differences between the grids of Latin American countries and the California USA ISO grid, California as a 'mature market' provides interesting insights into both the benefit and challenges of intermittent renewable penetration as well as the value and need to combine it with more flexible generation technologies to meet service level requirements. While GDF is NOT declaring geothermal as the only solution for a renewables-based power system in any country, it continues to believe it is one of - if not - the most economical option in many countries across Central and South America. GDF's further concern is that many countries can currently achieve easy wins with wind and solar and are at risk to delay action on recognizing the aforementioned needs for the overall grid stability.

The GDF strongly encourages countries to pursue technical assistance funds and resources from providers such as international development banks and agencies who wish to encourage strategies to optimize the penetration of BOTH intermittent and firm power sources. Specifically, the challenge is a strategy that results in penetration of both categories happening in parallel to continue to improve both the cost and effectiveness of renewable power generation and delivery. Several development institutions are willing to provide this type of technical assistance support if a country were to address the optimization challenge and policy gap. The qualitative goal is to transition away from fossil fuels, but the quantitative cost must recognize not just the cost for power in isolation, but the cost to operate and even improve the grid and client service level within the country.

The GDF is designed to address the challenge of high risk and capital intensity related to exploration drilling for economically viable geothermal projects, a finance problem with an underlying technical challenge. We know that for a geothermal project to advance there must be a positive policy, technical, and finance solution in place. After having completed four rounds of applications for GDF funding, and with data from all countries and 50+ applicants and the continuous aspiration to improve the fund structure, we see the policy gap outlined as the currently greatest deficiency and feel compelled to raise this to the attention of all GDF countries. We do anticipate that some



countries will address this policy gap and have taken first steps in the right direction, and may, as a result, be significant recipients of GDF funds. We also believe these countries will achieve the lowest total cost of reliably delivered power within their country and will be able to provide the greatest sustainable positive impact to the environment.

Recommendations:

- 1. A sustainable energy matrix in the Americas is most effective through a combination of firm power, intermittent power and flexibility in parallel deployment.**
- 2. Option price considerations should be given for grid stability and availability; therefore, firm renewable power should have differentiated pricing.**
- 3. Additional policies are necessary supporting geothermal energy development in order to achieve the lowest total cost of reliable power within the GDF countries.**

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