

A RISK MITIGATION FRAMEWORK FOR DEEP GEOTHERMAL CROWDFUNDING

The exploration risk – as the risk of not finding a geothermal reservoir in sufficient quality or quantity for commercially viable exploitation – significantly contributes to the relatively slow development of the deep geothermal industry. Several exploration risk mitigation schemes have been established or are currently being developed internationally. So far however, none of the schemes comprises the possibility to **combine exploration risk mitigation and alternative financing solutions** for geothermal projects. Yet, alternative finance methods like crowdfunding can be vital elements of the funding plan for deep geothermal projects.

New approaches to financing for geothermal developments also bring about new types of risks. **Community investors** in geothermal projects basically face the same exploration risk as **project developers**. Unless the drilling success is secured by a risk mitigation scheme, retail investors are also in danger of losing their investment in case of project failure. If geothermal crowdfunding shall be applied more widely, an accompanying mechanism is needed that can keep the exploration risk away from non-technical community investors.

The vision of CROWD THERMAL Work Package 3 thus was to develop recommendations for a novel exploration risk mitigation scheme to complement alternative financing solutions for deep geothermal projects. In *CROWD THERMAL Deliverable 3.4*, we present the conceptual framework for a **new support mechanism** that can **facilitate public participation in geothermal funding, protect private investors' interest and encourage new geothermal project developments**.

Experiences from former and current de-risking schemes led to a concept for a pan-European, Geothermal Play Type-independent exploration risk mitigation scheme. It is suggested to establish a **CROWD THERMAL Risk Mitigation Fund**, ideally financed by a European, public funding source. The fund shall be a support instrument mitigating the financial risks associated with subsurface uncertainties of geothermal projects. It shall be applicable to public, private and PPP deep geothermal projects that raise a minimum of 5 % of their project CAPEX from community investors through loan-based alternative financing methods (crowdfunding (loans), direct lending or green bonds).

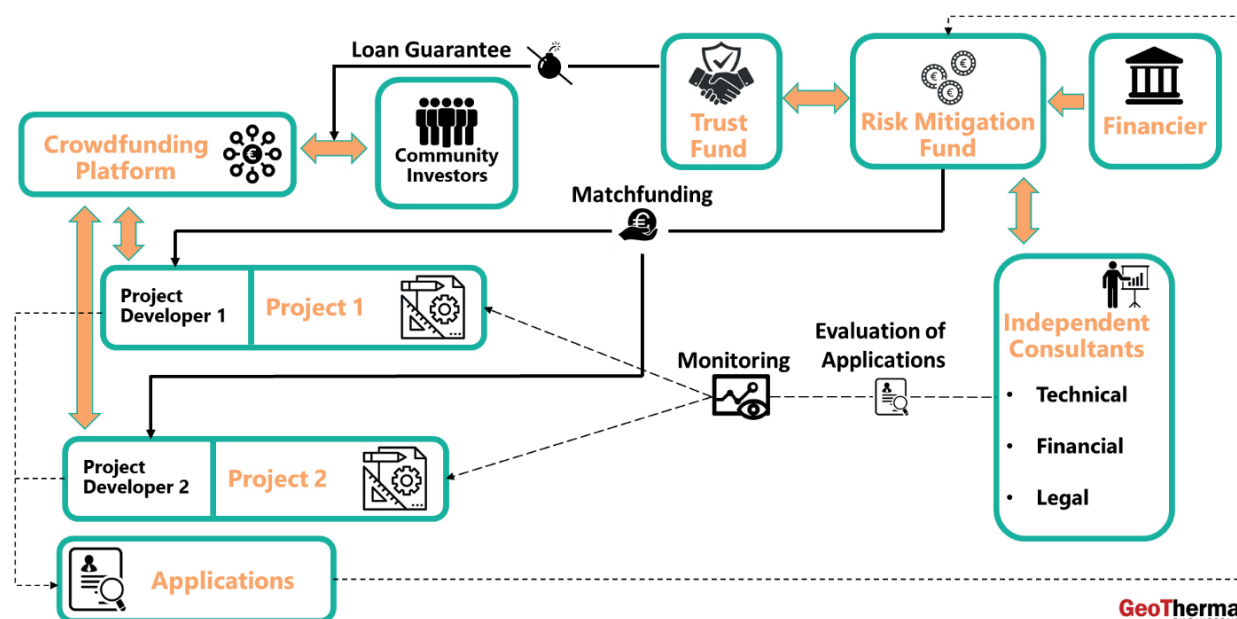


Figure 1: The Proposed CROWD THERMAL Risk Mitigation Framework.



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The proposed support framework includes a grant-based, co-financing component in the form of **matchfunding** and a risk-sharing component in the form of **loan guarantees**. The matchfunding shall be paid as a grant to the project developer prior to exploration drilling. It shall match the amount of funds that can be raised from the public. The loan guarantees shall mitigate both the **short-term exploration risk** in the drilling phase and the **long-term subsurface risks** during operation. In case an economically viable project operation is not or no longer possible, they secure the (partial) repayment of community investors' loans. In case it is needed, the loan guarantee amount will be paid from an **ear-marked Trust Fund**. Payments from the Trust Fund will be made through the crowdfunding platform or financial intermediary facilitating the community funding process.

The decision over project success and failure is made on the basis of **project-specific reservoir and economic parameters**. The short-term loan guarantee will step in after the first or second well in case the actual reservoir parameters do not allow an economically viable project. The threshold for the long-term loan guarantee to step in is a negative EBITDA during operation. Successful projects are required to pay back royalties.

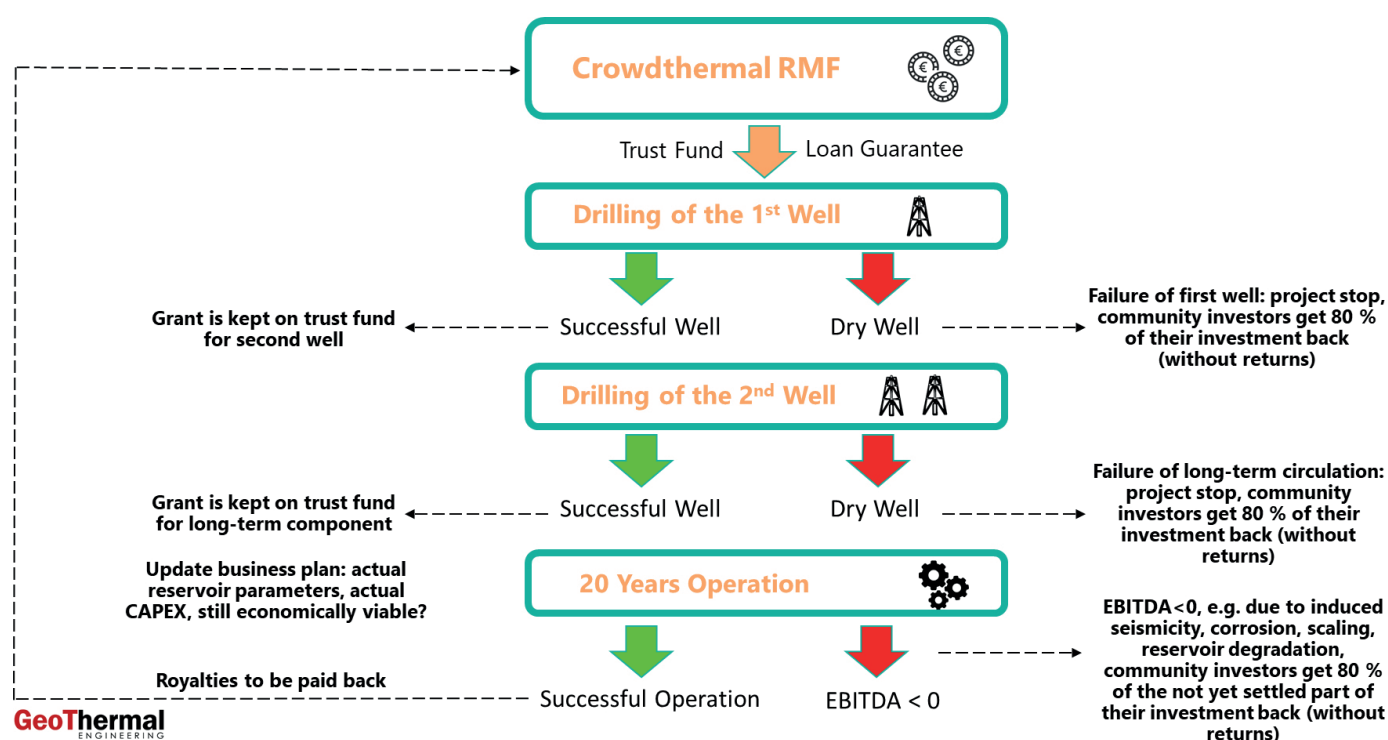


Figure 2: Operating Principles of the CROWD THERMAL Risk Mitigation Fund's Short- and Long-Term Loan Guarantees.



Illustration: Leonnidas - Text: GeoThermal Engineering



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The proposed support framework offers the following benefits:

- It encourages deep geothermal project developers to apply alternative financing solutions.
- The matchfunding support is an incentive for project developers for a maximum use of financial community engagement. At the same time, it positively leverages community funding.
- Providing matchfunding grants prior to exploration drilling reduces the amount of (equity) risk capital needed by project developers. The co-financing contributes to the project budget that can be used for early phases' CAPEX and helps to close the financing gap.
- The proposed loan guarantee prevents large resource risk-related financial losses of the crowd investors. The financial risk to be carried by individual community investors becomes much more predictable and acceptable. The investment will become more attractive.
- Adding a guarantee to alternative financing loan instruments introduces more flexibility in investment opportunities in the early project phases. It also gives people with lower risk appetite the opportunity to be part of the project from the beginning.
- For project developers, crowdfunding is relatively costly. Due to the high-risk profile of deep geothermal projects, investors usually expect high returns. A loan guarantee reducing the risk level for community investors can entail lower return expectations that have to be met by project developers.
- For project developers, the guarantee helps to pay back loans in case of project failure. It considerably reduces the financial risks associated with subsurface uncertainties. Besides the focus on the exploration risk, other subsurface risks like drilling risks, corrosion, scaling, or long-term degradation of the reservoir are also captured by the proposed approach.
- The Trust Fund concept and the co-operation with platforms or financial intermediaries ensure that the loans of community investors are not subordinated.
- The proposed framework gives support in several project phases and assists sustainable developments.
- The scheme can help to pool community-financed geothermal projects for knowledge exchange, the use of synergies, and to achieve a critical mass.
- The presented framework is applicable to all Geothermal Play Types, regardless of their geological or structural settings. It supports different deep geothermal project types and sizes and can equally encourage the development of low, medium, and high enthalpy resources.

Once established, the presented CROWD THERMAL exploration risk mitigation framework for deep geothermal projects can achieve a **significant reduction of the main risks** that are faced by both project developers and community investors, thus leading to **increased funding and project realisation**. It can be an effective way to assist the geothermal sector and to facilitate European market development.



More information:

CROWD THERMAL Deliverable 3.4 [Draft structure of a play type independent geothermal exploration risk mitigation scheme](#)



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