

Rödl & Partner



African Union a United and Strong Africa

GRMF HEAT – TECHNICAL ASPECTS

1ST APPLICATION ROUND KICK-OFF WORKSHOP

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A certain level of planning should have been reached to be eligible for the GRMF HEAT program.

<u>The Surface Study (SS) is to refine</u>
<u>previous studies in order to site the</u>
<u>first well.</u>





Each geothermal system is unique.

The production capacity of geothermal systems is highly variable depending on:

- Temperature
- Reservoir volume
- Geology and tectonics
- Fluid chemistry
- Dynamics and physics

Detailed studies and exploration of the geothermal resource are the foundation of successful geothermal development.







Compared to high temperature systems the medium to low temperature systems are sometimes in greater depth of basin areas.

- Use of magneto-telluric method has less importance.
- Seismic measurement is quite useful and frequent method to identify the internal structure of the sedimentary layers for locating faults or the depth position of the targeted aquifer.
- Target temperature depends on planned application.





Typical surface surveys for locating the site and target for the first wells in low to medium temperature direct use project development are e.g.:

- Data gathering
- Evaluation of existing borehole data
- Interpretation of existing seismic and gravity measurements
- Evaluation of geological maps
- Analysis of tectonics, stress field and fault kinematics
- Geochemical analysis of chemistry data
- Creation of 3D conceptual model of the resource
- Sampling and analysis of wells and thermal springs
- Performing seismic measurements
- Planning and drilling temperature gradient wells

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For a successful application, please keep in mind to:

- Read the Developer manual.
- Make sure you know what you want to do and that it is eligible.
- Follow the given formats and fill in <u>ALL</u> sections.
- Give all available information.
- Make sure application forms are in coherence with each other.





Eligible costs

Surface studies (up to 80%) of approved eligible costs:

- External consulting cost for preparation of EoI and full applications (for public entities)
- Rental or provision of technical equipment
- Materials and specialist services such as drilling and logging for shallow TG wells
- Providers of special services
- Personnel, on-site accommodation and transport
- Purchase of aerial photography, remote sensing data or equivalent.
- Consumables
- Feasibility study
- Environmental/social studies and assessments
- Environmental/social permits and licenses
- Environmental/social studies/-impact assessments and -management plans
- Well design and drilling program
- Documentantion and reports preparation
- Project management
- Mandatory insurances
- Eligible, reasonable and agreed contingencies

Associated infrastructures (up to 20%) of approved eligible costs:

- If applicable: Access roads and/or access road maintenance
- If applicable: Water supply infrastructures to operate a single rig from TG well drilling
- If applicable: Transport and crew accommodation
- Eligible, reasonable and agreed contingencies





- A concession wide reconnaissance study is not eligible in GRMF.
- The project area of a Surface Study should be within a previously known geothermal area.
- If the prospect area is near or within the boundaries of another prospect, evidence and justification that the two prospects are not connected is required.





Justification of actions

- The eligibility of proposed actions can be clarified by connecting the dots on how previous geoscience studies of the area support them.
- The applicant is advised to state clearly what studies have been conducted in the prospect area and how these previous studies are used to define the proposed surface surveys applied for.







Resource temperature

To avoid uncertainty regarding estimated resource temperature:

- State the range clearly.
- Support your estimate with references to surveys of the area.





Work plan

- the Applicant is advised to take care to focus the proposed work on a specific area, which has been identified in previous surveys.
- Work plan should be reasonable for the study area, suggested actions should be supported by previous studies and justified for the siting of the first wells.
- Quantification and duration of actions should be clearly presented.



Experience

Experience of key personnel and experience of the eligible entity are main criteria and need to be met for the project to be eligible for the application phase.

In case of a known experience gap within the Applicant project team please present a strategy for how this will be solved.

In case the Applicant has multiple projects, it is good practice to include also the staffing strategy to meet the expected workload in case all applications are successful.







Cost estimate

- Breakdown is necessary and should be according to planned activities.
- Budget break down is required to show costs of the individual studies scheduled in order to enable cost comparison.



Concept strategy and market viability

- Explain the concept of the direct use facility.
- Have some potential customers in mind.



Feasibility Study

Surface studies shall include a feasibility study regarding the exploitation of the resource and the available market for direct use applications including:

- Market analysis
- Concept strategy
- Design premise
- Engineering works, including surface installations
- Cost/benefit analysis
- Financial analysis
- Risk assessment
- Social & Economic Benefit
- Assessment of regulatory framework regarding implementation of proposed project (e.g. licensing, concessions)
- Project Schedule







Evaluation criteria

Main evaluation criteria	Max score
Geo-scientific and strategy	65
Financing plan & permit	10
Experience	25
Total	100

- Minimum points for successful Eols: 70.
- Evaluation based on submitted information.
- Emphasis on resource, strategy and experience in Surface studies.
- Information on Evaluation Criteria can be found in Annex 1 of the Developers Manual.

3. COMMON PITFALLS

Contradictions in schedules

- In the review the connection between description and justification of the activity and work plan is used to justify the costs applied for.
- All cost should be connected to activities that have a specific duration and execution stated in the work plan and are justified by previous studies of the field.
- When the sections are in contradiction, in terms of e.g. justification of action, method used and size of area to be surveyed, it affects the review accordingly and the cost is questioned.



Description:

Action 1 described and justified

.

Work plan: Methodology and duration for Action 1

Cost estimate:

Cost estimate for Action 1 in coherence with previous sections

4. TYPES OF DIRECT UTILIZATIONS





Illustration: Mannvit 2017

*Renewable hydrogen can be produced using geothermal electricity and/or heat.



Thank you for your attention!



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