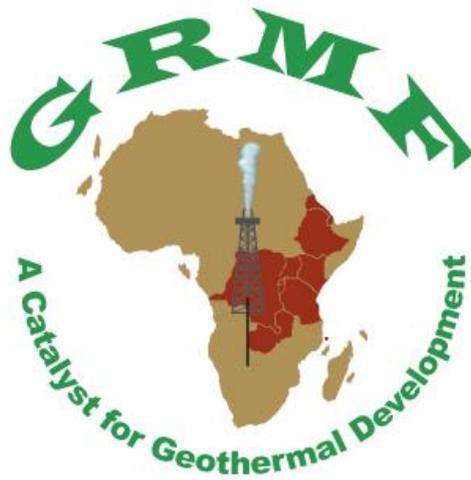




GRMF Developer Survey 2018



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Abbreviations

| | |
|------|--|
| AR | Application round |
| AU | African Union |
| EoI | Expression of Interest |
| ESIA | Environmental and Social Impact Assessment |
| GRMF | Geothermal Risk Mitigation Facility for Eastern Africa |
| IPP | Independent power producer |
| OC | Oversight Committee |
| PPA | Power purchase agreement |
| RGCU | Regional Geothermal Coordination Unit |



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1 Introduction

Within the 14th GRMF Oversight Committee (OC) meeting in Eschborn (Germany) on 7 and 8 May 2018 it was decided by the OC that the “GRMF Developer Survey 2018” shall be conducted by the Technical Consultant.

After approximately six years, and five application rounds of GRMF, the OC wanted to get a direct and structured feedback of all developers that applied since the first application round. Hence, the objective of this survey was to get an insight into the market, as well as to detect barriers and obstacles which impede the development of geothermal power projects in the region. The inputs and answers of the developers should reveal their perception of GRMF, improve the performance of the program, and help to identify barriers for the development of the geothermal sector in East Africa.

The survey was launched (using an internet based survey tool) on 21 May 2018 by the GRMF Regional Geothermal Coordination Unit (RGCU) of the African Union (AU), and it was closed after a duration of three weeks on 13 July 2018. The RGCU invited 29 developers (10 public, and 19 private ones) that applied in total for 64 projects (27 drilling programs, and 36 surface studies) in eight different countries between 2013 and 2018, in the course of five application rounds.

Out of these 64 applications, so far 30 projects have been awarded for GRMF grants. The fifth application round (AR 5) was ongoing when the survey was conducted – consequently AR 5 projects have not been included.

The main sections of the “GRMF Developer Survey 2018” are the following:

- Program related aspects
- Developer related aspects
- Regulatory aspects

In total, the survey consisted of eleven questions, from which four questions have been for open answers (to get a written feedback from the developers), and seven questions have been closed (with answer options to be selected).

This report shall compile and analyse the findings of the survey.

2 Survey results

2.1 Participants

Out of the 29 developers asked, 14 responded, equating to a response rate of 48 %. This relatively high participation rate for an internet based, and not obligatory survey indicates that GRMF has a high priority among the participants of the program and that they are interested in working towards an improvement. (Note: Within the available contact list of the developers, there might have been also persons no longer working in the field or region).

The participant structure is composed of 10 private and 4 public developers. This relation approximately maps the composition of the 29 invited developers (public: 10, private: 19).

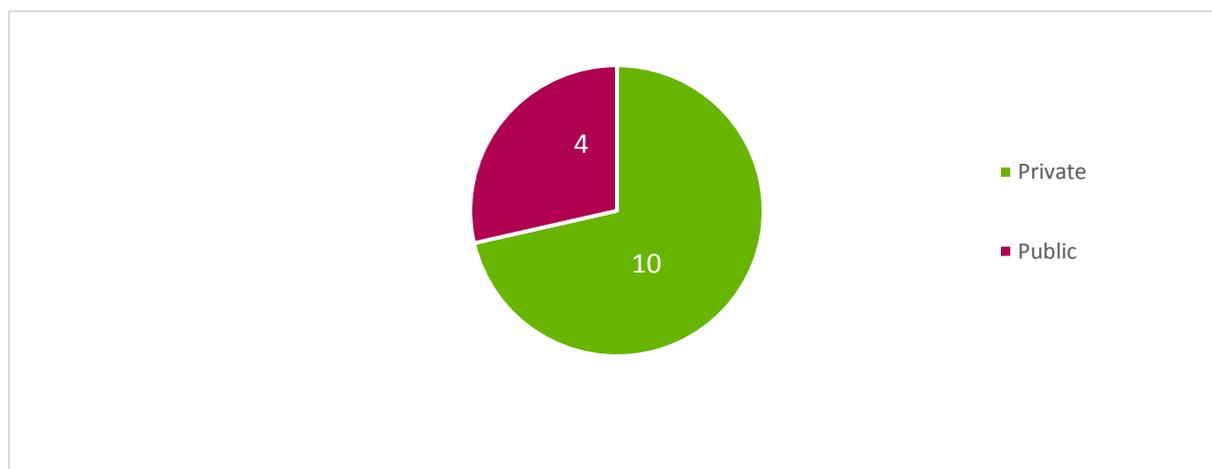


Chart 1: Entity type of the survey participants

Initially, GRMF only supported geothermal activities in the following countries:

- Ethiopia
- Kenya
- Rwanda
- Tanzania
- Uganda.

Meanwhile, another six countries from the Eastern African Region became eligible under the market incentive program:

- Burundi
- Comoros
- Djibouti
- Democratic Republic of Congo
- Eritrea
- Zambia.¹

The countries, in which the projects of the survey participants are located in, are limited to:

- Djibouti
- Ethiopia
- Kenya.
- Rwanda
- Uganda

¹ <http://www.grmf-eastafrika.org/about/countries>

Chart 2 shows a map of East Africa where the eligible countries are marked white and the respective countries considered for the survey are highlighted orange. The black number in parenthesis represents the number of awarded projects and the red number is the number of projects of the survey participants which are located in the respective country.



Chart 2: Map East-Africa with eligible countries marked white and respective countries concerning the survey highlighted orange

In this context, the following map shows the projects that have been awarded for funding by GRMF from Application Round 1 to 5.

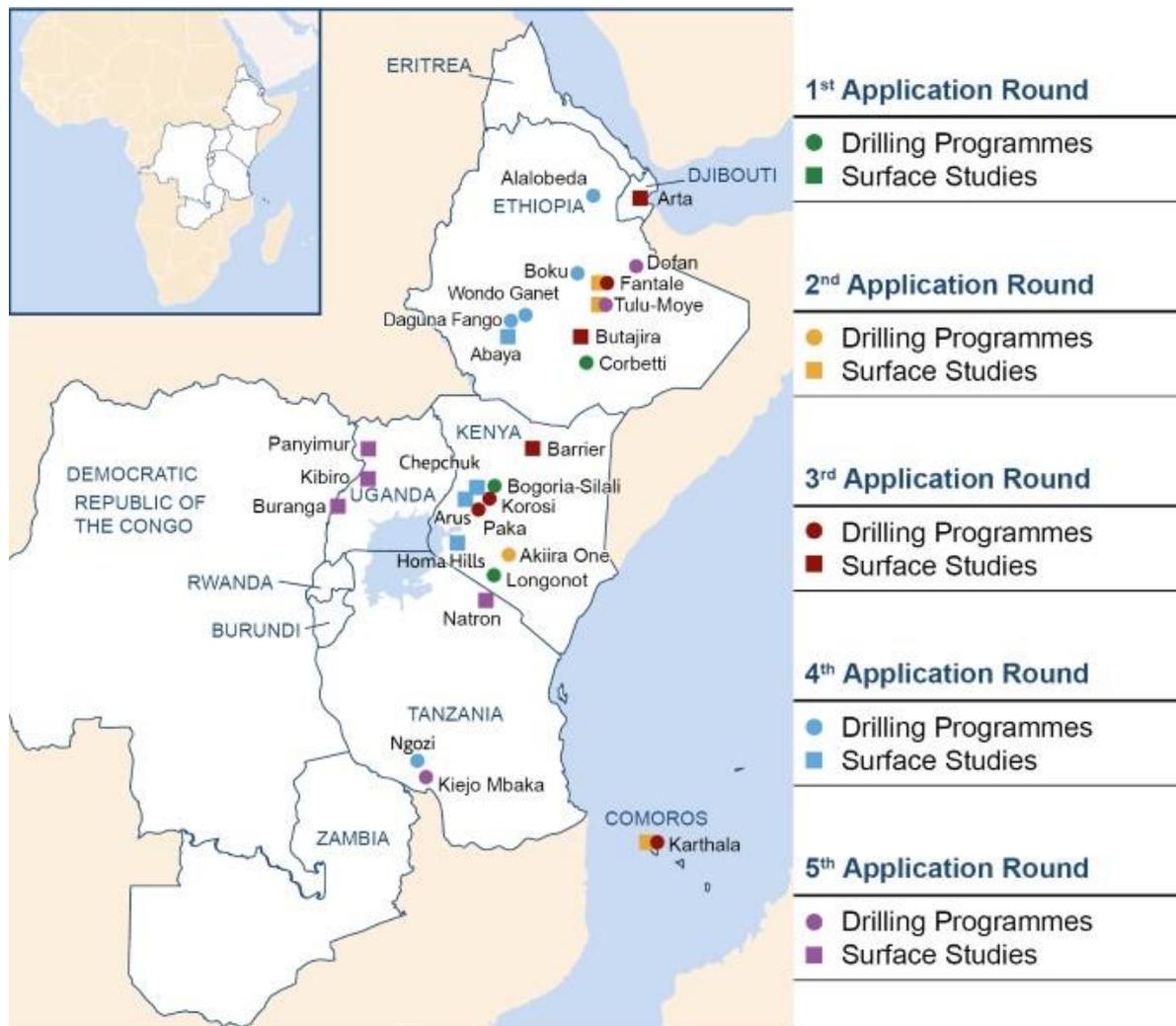


Chart 3: Awarded projects from Application Round 1 to Application Round 5

2.2 Program related aspects

The impact of GRMF as a market incentive program in East Africa, particularly in the respective countries, where the project is located in, is rated very positively among the surveyed project developers. As illustrated in chart 3 more than 85 % of the developers rated the impact as “good” or even “very good”. The statement “very poor” was chosen by none of them. Calculated with a grade system² from 1 to 4, an average grade of 1.86 emerges, which lies between “good” and “very good”.

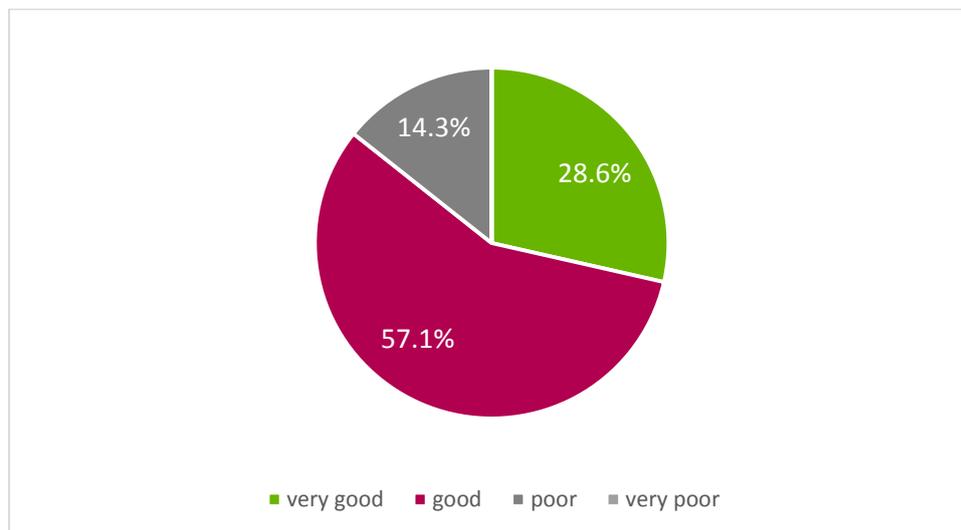


Chart 4: Rating – impact of GRMF as market incentive program in East-Africa and the country where the project is located in particular

The communication of GRMF/ RGCU before bidding, and in general via website, email or on conferences and information workshops, is rated even better. With nearly 93 % almost the entire surveyed group seems to be satisfied with the communication approach of GRMF/RGCU. Significantly more than the majority (57 %) awarded the communication with the best rating. The average³ with a grade of 1.5 is in the lower range of the top grades.

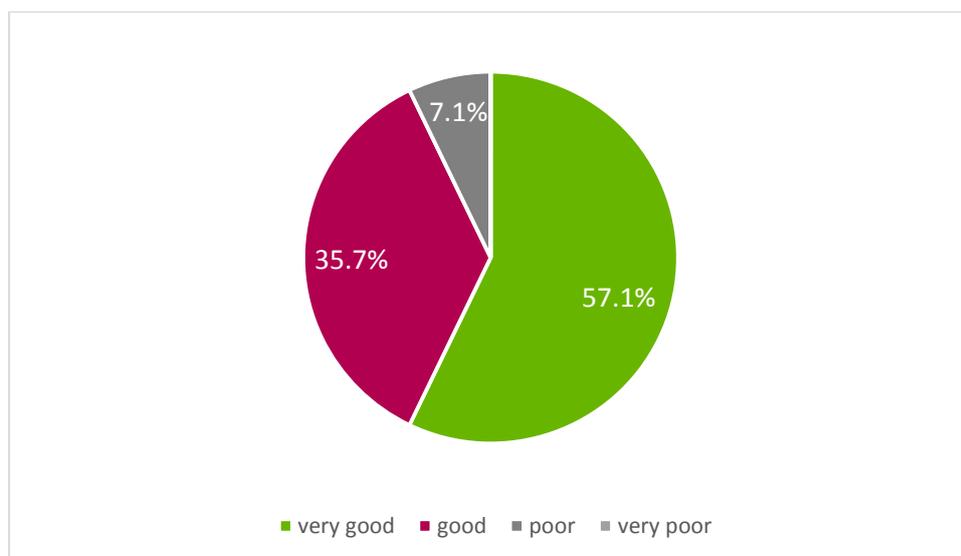


Chart 5: Rating - communication of GRMF/RGCU

² Grade 1 = „very good“, grade 2 = „good“, grade 3 = „poor“, grade 4 = „very poor“

³ For calculation please see footnote 2.

A similarly positive feedback emerges from the next question (see Chart 5). Once again nearly 93 % assess the quality of the feedback they receive of the Regional Coordination Unit (RGCU) e.g. in the award letter or after the submission of documents – to be “good” or “very good”. The highest rating was given by 35.7 %, the lowest by none of the developers.

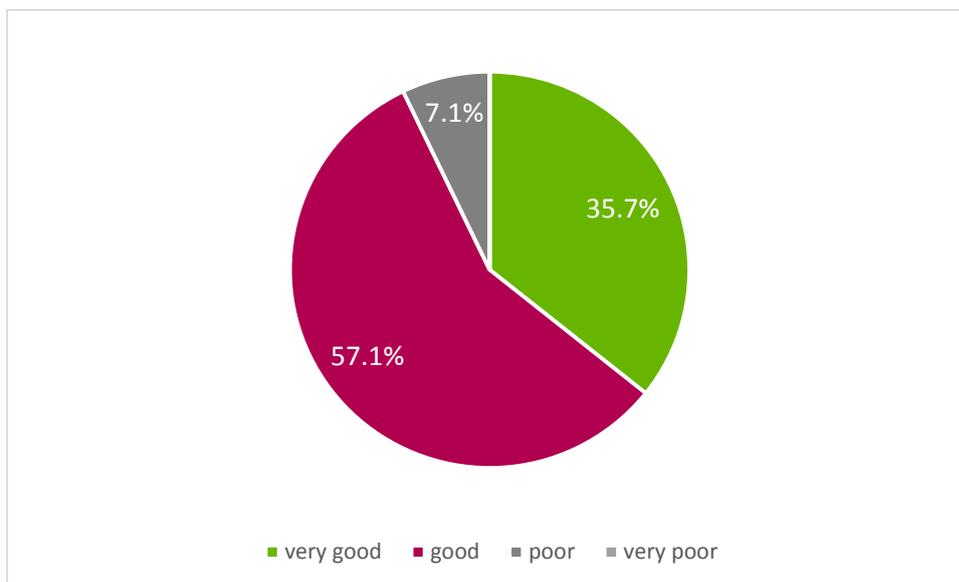


Chart 6: Rating – quality of the feedback received of RGCU

The open questions shall give the participants the opportunity to address a direct verbal feedback to AUC. The objective is to get an insight into the challenges of applying for funding from GRMF as well as new ideas to change or improve process, etc. The first question was asking the developers for improvements or changes on GRMF to increase its impact on the market. The main issues mentioned in the answers are compiled in the following graph:



Chart 7: Open question – Fields of improvements or changes for the GRMF to increase its impact on the market



As a short summary, it may be stated that developers are particularly concerned about transparency, risk reduction and assurance for their projects (from financial perspective), process efficiency, cooperation with other organizations and financial aspects.

Precisely the following aspects have been mentioned:

- With regard to the issue of transparency there are especially demands for a clear distribution of roles and responsibilities and the fullest possible disclosure of information.
- Further suggestions for improvement are the implementation of an online reporting system with a diary format showing each and every updated comment or
- A cost database of geothermal activities in order to increase the pricing transparency for developers.
- Slim well drilling should be given 60% grant as a middle step between surface study and production drilling.
- An additional insurance mechanism to even further reduce the high risks of geothermal projects especially for private developers was also stated as a wish.

Another process for which the surveyed developers see potential for improvement of GRMF is the speed and efficiency of the general procedure. The responses of the survey indicated that the process should be leaner and faster in order to match the speed of the project development. In particular the following aspects have been highlighted:

- The release of funds should take place on time in accordance with the schedules to avoid delays of the whole project.
- The EoI-process (Expression of Interest) should be carried out online and submissions to being accepted year round.
- A better cooperation with other organizations should be achieved, e.g. development agencies and donor facilities to create a pool for long term capital facilities
- Several issues concerning specifically the financial aspects of the market incentive program have been raised, like additional funding for exploration, higher grants for drilling or concerning infrastructure costs, grants should cover up to 80 % of all eligible costs in relation to drilling exploration wells and testing program for reservoir confirmation wells instead of 40 %.

There are also developers that name aspects not targeting GRMF itself but impeding the realization of many projects. Especially corruption is considered to be a huge problem, which might be addressed by a country corruption evaluation system to determine country eligibility for GRMF activity.

2.3 Developer related aspects

This section of the survey discusses the aspects concerning the developers themselves. They were asked to name the biggest obstacles or challenges of their geothermal project and what should be done to overcome them. The following chart shows the main issues the developers mentioned:



Chart 8: Developer related aspects

The financial aspect is seen as one of the biggest challenges by the developers, regardless of whether they belong to private or public entities. Apart from technical and social issues, which affect public and private developers almost equally, for private developers primarily legal issues are a huge obstacle to the realization of their projects. Furthermore, some other problems the developers have to deal with were mentioned. Once again, the majority of these other mentioned challenges – such as the lack of government framework and corruption - are problems having a huge negative impact on the realization and progress of the project and not deriving from the funding program GRMF itself.

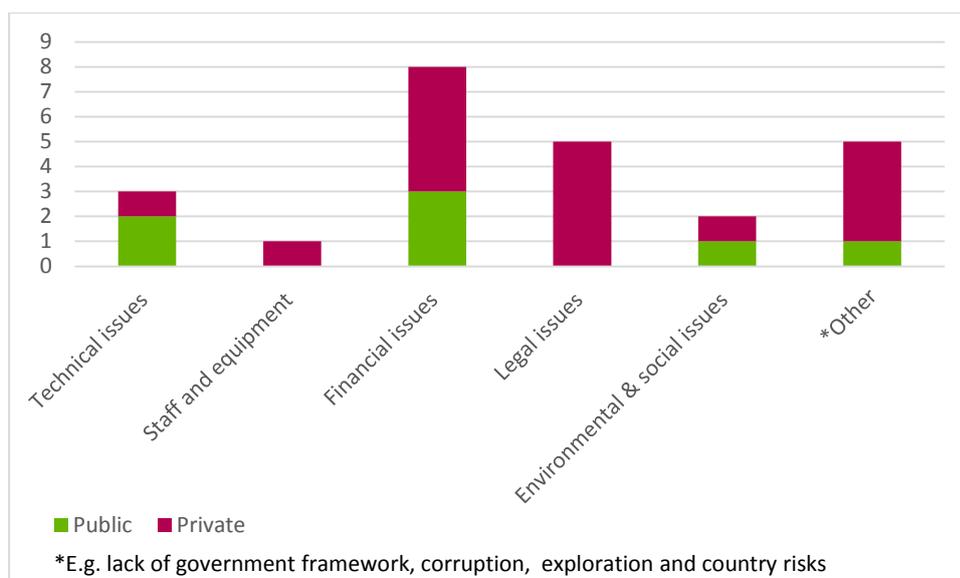


Chart 9: Major obstacles or challenges of the geothermal projects

The biggest obstacle seems to be the financial situation, described as the key for the development of projects. Nearly every participant named financial issues as a major risk. Particular issues mentioned by the participants were:

- Higher funding to their projects in order to stay in the frame of the financial plan and thus not to exceed the project amount.
- Especially mentioned were higher grants for infrastructure for early stage projects or the possibility to reassign the grant to another project .
- Another suggestion of a participant was to put more effort in inviting additional lenders in order to provide a well-equipped basket for early stage derisking.
- Also the financial support of the drilling exploration seems not to be high enough. A participant mentioned that especially for private investors, financing 60 % of the drilling of the first well would still be a very risky undertaking.
- Earlier payment and a shorter disbursement-process were addressed in addition.
- Furthermore a monthly report to take account of late payments was suggested.

Although most applicants are quite satisfied with the administrative activities of GRMF, still a few comments and suggestions for improvement have been expressed:

- Especially the speed of the various different steps in the administrative process was named as relevant obstacle in several statements. As an example they referred to the late confirmation for reception of submission and a timelier grant reimbursement once the developer has fulfilled the criteria.
- Higher level of reliability of the GRMF and
- More geothermal experience within GRMF and the AU.
- Requirements that have to be met in the application process have been described as a barrier and should be decreased according to a statement of a participant.
- Demand for proper and bankable design as well as expertise concerning PPAs, especially for the meanwhile present IPPs (independent power producer).

But participants do not only see obstacles in the financial area or in the administration of GRMF, they also encounter challenges in technical issues:

- Lack of adequate capacity in the geothermal region with the consequence of extra costs for the purchase of equipment
- Difficulty of finding human capital in this specialized industry
- Problems with finishing projects in time and meeting the work schedule; suggested solutions: strategic partnerships to leverage financing and technical expertise.

In addition to the above-mentioned directly project-related topics in the application and implementation phase, the political background in the respective countries is a major obstacle.

The problem area is extensive:

- Corruption
- Political acceptance of private developers
- Currency stability
- Geothermal experience
- Licensing problems.

A few solutions concerning those obstacles have already been proposed by the participants of the survey:

- A third party evaluation of each country in terms of the corruption level and
- A framework that allows private and public institutions to work and support each other.

As chart 8 has already shown, the financial issues, as the most cited challenges, are at the same time the difficulties, where support is needed the most. Support concerning legal, environmental and social issues is also highly demanded. In addition to the suggested answer options, two more issues were mentioned. There is the problem about corruption that is particularly addressed by a developer whose projects are located in Kenya. Furthermore, more support concerning geothermal resource licensing and closing of PPA is demanded.

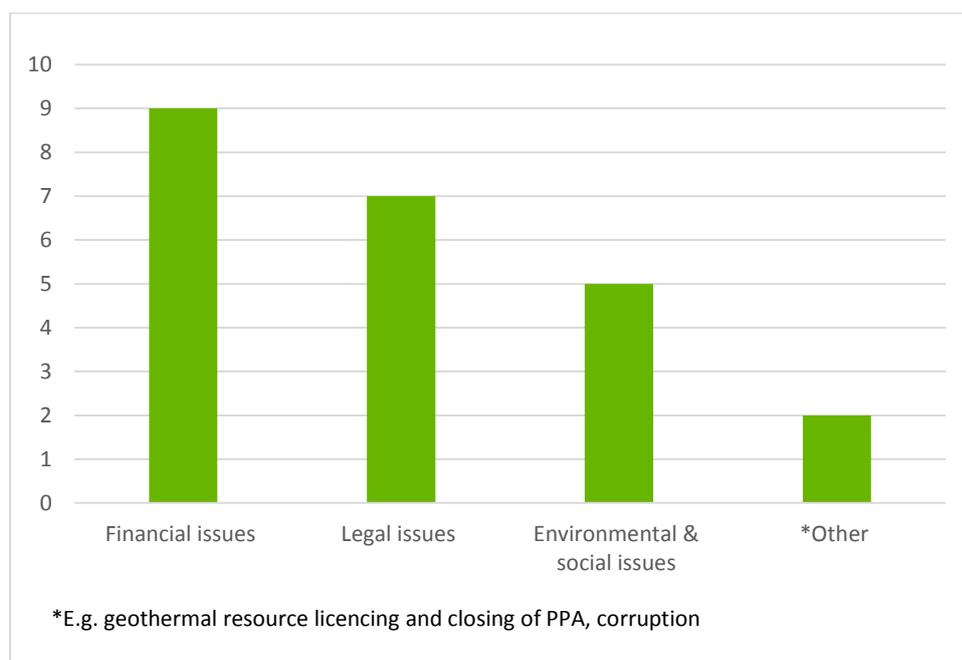


Chart 10: Obstacles for which a better support is needed

In the next question the participants have been asked about suggestions on how the external support could be organized in order to accelerate the development of the project. The answers covered many different areas. Especially the funding itself as well as the entire financial issue including investments, grants and loans seems to be an important topic for most of the participants:

- An increased amount of grants for drilling (e.g. at least 60 % for three full wells or higher grants (%) for drilling-projects in new geothermal fields)
- Favourable tariffs for sites with more wells
- Flexible contracts that can be re-assigned.

Closely connected to the financial part is the avoidance of risk. Despite the praise for the way how GRMF assists in the mitigation of the exploration risk, participants of the survey request for different kind of further risk guarantees. They proposed an insurance mechanism



particularly for the private sector to cope with the risk of a lower well productivity than expected. Again it becomes clear, that especially private investors see themselves in a weaker position compared to public investors.

As already mentioned in connection with another question, the participants referred again to the speed and efficiency of the funding process. They demand:

- Less confrontation with bureaucracy during the fund allocation process
- Timely provision of funds and the organizational reviews to evaluate the performance of the project and accelerate its development
- Valuable know-how and consultation
- Access to dependable recommendable technical organizations for studies and environmental as well as social advisory
- Expertise in the exploration and policy advisory to publish the data after a set period to encourage the temporal development
- A more uniform legal framework in the diverse east African countries to facilitate the development process of projects especially for developers realizing projects in different countries
- A technical assistance through agencies or grants and a smooth licensing process

Furthermore, according to the participants of the survey, politics play an important role in connection with the acceleration of the development of the projects. Hence, the government should be able to take care of community issues. To improve this, a participants suggests to increase resource and capacity within the relevant departments of the government and also of the GRMF/AU

2.4 Regulatory aspects

When asked in which country most of their geothermal projects are located, the majority of the survey participants named Kenya. A country that is – compared to other countries in East Africa - already very advanced in this regard. Three developers named Ethiopia, while the other developers focused on Rwanda, Djibouti and Uganda.

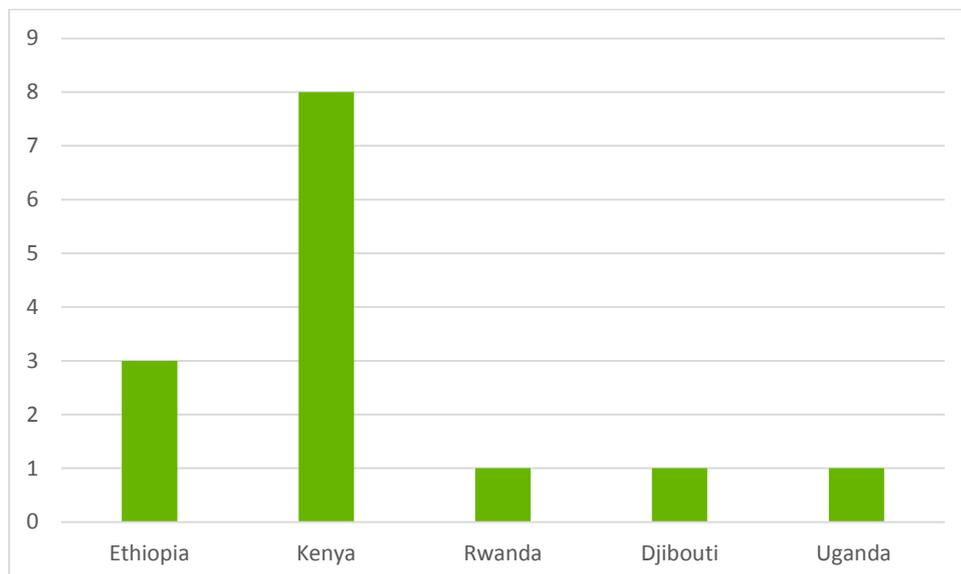


Chart 11: East African country where most of the developer’s geothermal projects are located in

In the further course of the survey the participants should assess how robust or weak the regulatory framework for the geothermal sector in the respective country is. Aspects like existence of sector specific license applications, existence of standard PPA or guidelines/regulations for PPA negotiations should be considered. The results of the evaluation show a need of improvement especially in Ethiopia. Every developer described the regulatory framework in this county at least as weak and two thirds even considered it as very weak. In Kenya the opinions were controversial, but the majority rated the framework as robust or even very robust. Regulatory framework in Rwanda seems to be weak, whereas the developers with a focus on Djibouti and Uganda seem to be satisfied.

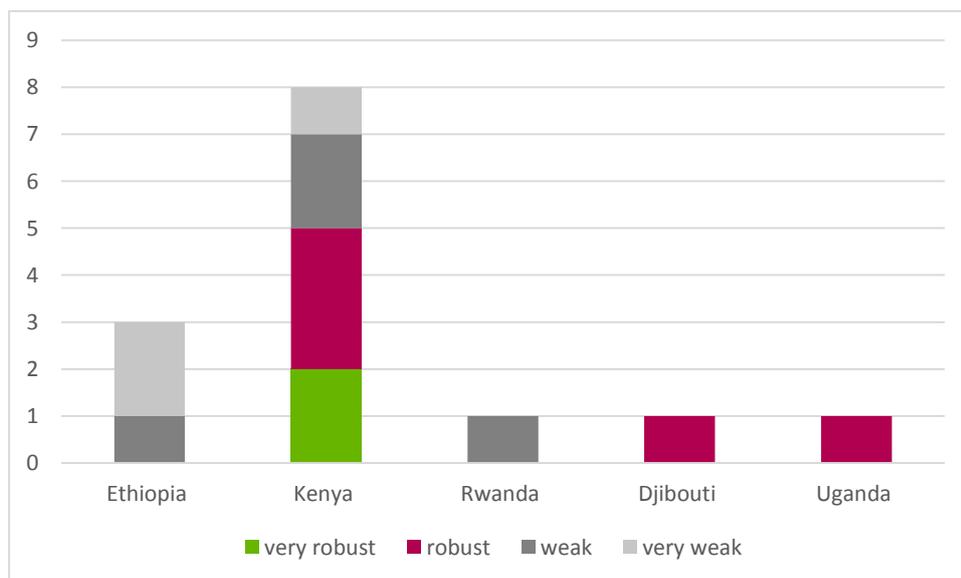


Chart 12: Rating – How robust or weak is the regulatory framework for the geothermal sector in the respective country



The next question was designed open to give the survey participants the possibility to address their problems concerning the regulatory framework in own words and suggest solutions. In particular the following demands have been mentioned:

- A transparent framework
- Clear distribution of the role of authorities
- A better approach to socio-political issues
- Increase of the capacity within the relevant government departments and the stakeholders management.

However the major topic of this question is the design of the PPA. According to the developers there is no need for a standard PPA because each project needs a different set of incentives. However, there are still several open points that need to be improved.

Precisely the following aspects have been highlighted:

- Contracts, that are more flexible and dependent on the size of the project
- Clear regulation guidelines determining the design of the process of PPA negotiations
- Negotiation in line with letters of support or political risk guarantees which are more transparent and straight forward
- Both, the licensing and the PPA processes have to get faster in order to avoid delays
- More tax incentives, import tax holidays, corporate tax holidays among other incentives



3 Conclusions

First of all, there need to be said that the program itself is widely accepted and the participants in majority are - concerning the impact of GRMF as market incentive program, the communication of GRMF/RGCU and the feedback received of RCGU - satisfied. With regard to theses aspects the feedback is quite positive. The objective of the survey however, was to detect obstacles and barriers which impede the development of geothermal power projects in East Africa in order to improve the program , and enhance the development of the geothermal sector in East Africa. With regard to obstacles and barriers developers still have to deal with, the following issues have emerged throughout the survey: financial aspects, transparency, risk reduction, process efficiency and cooperation with other organizations. In principle the developers/ investors intend to maximize their profits and minimize their risks. Additional issues like transparency, process efficiency and a better cooperation with other organizations finally serve the same purpose. GRMF already makes a big contribution concerning these issues, but still has room for improvement. In order to realize a continuous improvement process, weak points have to be found and eliminated. For the developers that means e.g. an even higher financial support, a smarter and leaner funding process, clear roles of authorities, additional assurance and flexible PPA contracts on one side with clear regulation guidelines on the other side. Beside these aspects which can be influenced by the market incentive program GRMF, there are also problems mentioned not targeting GRMF itself. Especially the regulatory framework, which is rated different depending on the respective country and other problems like corruption, legal issues and political background, among other things, were mentioned as huge obstacles, where action need to be taken.