The AUC/KFW Geothermal Risk Mitigation Facility (GRMF) — A Catalyst for East African Geothermal Development

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ABSTRACT

The East African Rift is wildly believed to possess a tremendous potential for geothermal development. However, despite the potential and the need for substantial growth in electrical generation capacity throughout the region, development activities have been slow to materialise. A new program – Geothermal Risk Mitigation Facility – is now in place to accelerate development by providing costs share grants for exploration and reservoir confirmation drilling.

Introduction

The East Africa Rift zone has for decades been considered as one of the potentially most important geothermal areas in the world. It stretches from Eritrea in the north to Malawi in the south covering nearly 3,500 km or some 2,200 miles.

East Africa is also home to one of the world's fastest growing populations and one where less than 10 percent of the regions population now has access to electricity as shown in Figure 2.

But despite the potential and the promise that geothermal could play a major role in electrification of the region, progress has been agonizingly slow. And although the first geothermal power plant was dedicated in Kenya some 40 years ago, there is still less than 300 MW_e of installed capacity in the region.

However, much of the groundwork that is hoped will lead to the fulfillment of the promise has been laid. Numerous bilateral as well as multilateral initiatives, often led by the World Bank, have helped

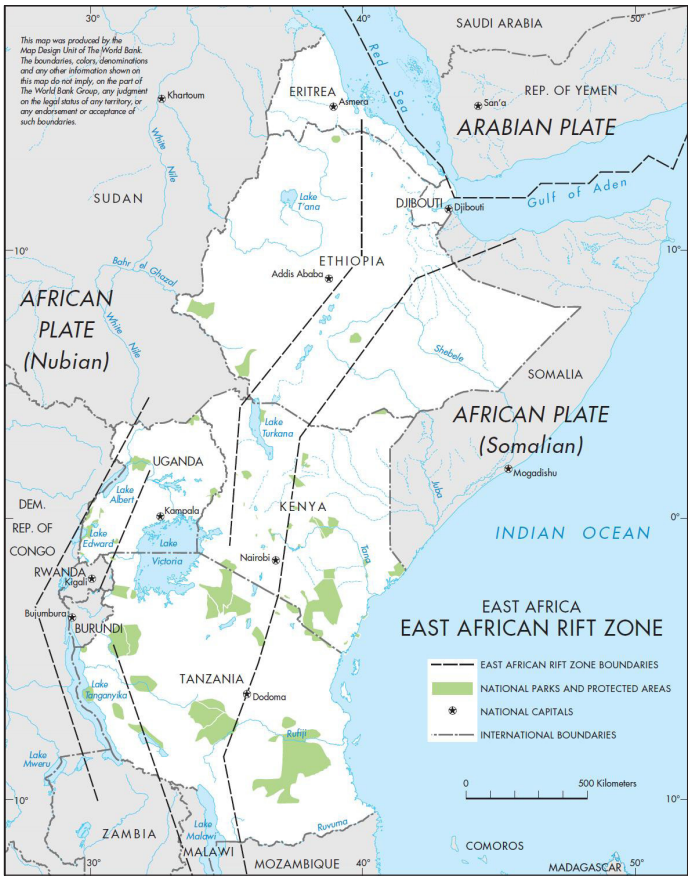

Figure 1. Map of East Africa.

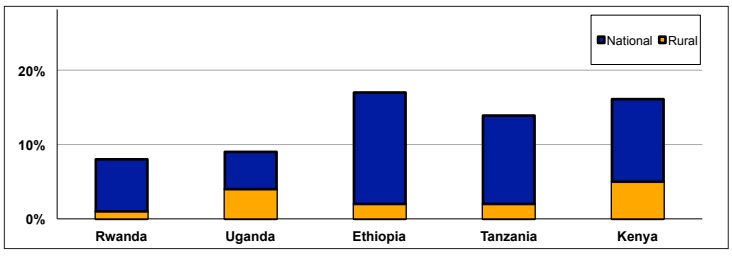

Figure 2. Electricity accessibility in selected East African countries (Source: US AID, Powering Agriculture, An Energy Grand Challenge for Development; African Energy Atlas 2012.)

not only to create the Kenyan model, but in identifying numerous high potential sites for near term development. Success in better defining the regions high potential sites has been achieved through the efforts of such support agencies such as those from bilateral development agencies. Sites such as Olkaria, Menengai, Suswa, Alid, Assal, Tendaho and Aluto-Langano are now well known in most geothermal circles. Progress has also been made in educating and training geologists, geophysics, geochemists, drillers, reservoir engineers, mechanical engineers, environmental specialists and power plant operators. The United Nations University in Iceland as well as similar programs that were available in Italy and New Zealand have helped to create the human infrastructure that will be critical for accelerating developments not only as we are presently seeing in Kenya, but along the entire length of the East African Rift countries.

GRMF

The African Union Commission AUC/KfW Development Bank (KfW) GRMF initiative was initiated by the German KfW in the spring of 2010 when a consulting firm was retained by KfW with the explicit goal of establishing a multi million dollar fund designed to share a portion of the upfront cost as well as bear a portion of the risk involved in geothermal exploration and the drilling of reservoir confirmation wells.

The Consultant was tasked with selecting a host for the fund/facility and designing a grant program that would best meet the needs of both public and private sector geothermal power developers in the targeted countries of Ethiopia, Kenya, Uganda, Rwanda and Tanzania. Consultant's team conducted interviews with both public and private sector stakeholders throughout the 5 country region to determine how best to structure the facility.

By late spring of 2010 a decision had been made as to the selection of the AUC as the most appropriate host for the facility. This was based primarily upon the relationships that the AUC has with all of the countries in the region and the mandate that the Commission's Department of Infrastructure and Energy had received from the energy ministers to help facilitate geothermal developments in East Africa and to work toward the harmonization of the legal, institutional and regulatory frameworks within all of the East African Rift Zone countries.

Upon completion of negotiations between KfW and the AUC and the signing of the financing agreement, the next important step was the selection of a consulting team to assist the AUC for the operation of GRMF. The primary functions to be handled by the consulting team included tendering for projects, providing monitoring and oversight of both surface exploration studies and reservoir confirmation drilling and advising the GRMF Oversight Committee.

The selection process resulted in the consulting team being selected in early in early 2012 and the signing of a contract between Poyry of Germany and the AUC in March of 2012.

The structure of the program is seen clearly in Figure 3.

The GRMF, now funded at 50 million Euro (20 million Euro from the German Government and 30 million Euro from the EU Africa Infrastructure Trust Fund via KfW) or approximately 70 million US Dollars is a grant program designed to cost share exploration work leading to the siting of one or more reservoir confirmation wells as well as grants for the drilling of up to two reservoir confirmation wells. The facility is anticipated to be in place for a period of four years but could be extended if presently available funds are no fully expended during that period or additional funds are made available to the facility.

The GRMF has two primary elements, the first being grants for surface exploration that leads to the siting of wells for reservoir confirmation drilling. This element will provide grants of up to 80% of eligible expenses. Eligible expenses could include conducting various geophysical surveys and the interpretation of data from such surveys. It is anticipated that such grants will be given over the life of the facility.

The second element of the facility is grants for reservoir confirmation drilling. Grants will be awarded to cover up to 40% of eligible expenses related to the drilling and testing of up to two reservoir confirmation wells .If upon completion of such drilling, the grant recipient commits to taking the project forward, a continuation premium of 30% of the eligible expenses incurred during drilling operations will be made available to the developer. Eligible activities that would trigger the receipt of the "bonus" could include the drilling of additional production or injection wells, reservoir engineering studies, development of a project financing package, engineering studies required for generation facility design etc.

In addition to the above, grant applicants can also request grant assistance related to the establishment of infrastructure required in order

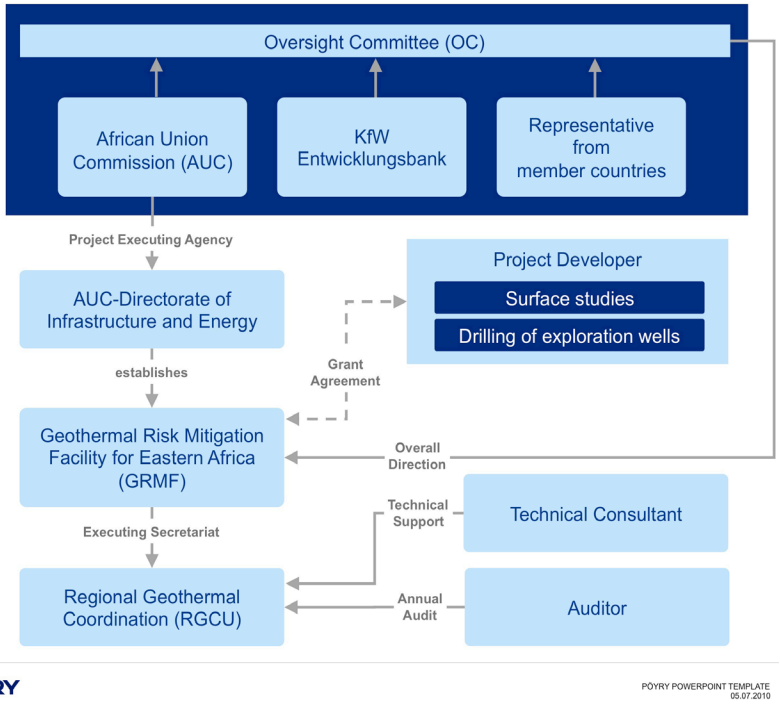

Figure 3. The structure of the GRMF Program.

to carry out exploration or drilling activities. Grants of up to 20% of required infrastructure improvements may be applied for in conjunction with the application for either surface exploration grants or drilling grants. Eligible infrastructure improvements could include improvements of roads to provide adequate access to the area, establishment of adequate water supply to support drilling operations etc.

Application to GRMF

One application round for grants related to surface exploration studies and reservoir confirmation drilling will be held each year.

Figure 4 provides a schematic of the application and award process.

Potential applicants will be invited to an information workshop. Following the workshop, a call for expressions of interest will be released and applicants must at that time make a decision as to whether they will apply for a grant leading to well siting or whether such studies have already been completed and they wish to apply for a grant for reservoir confirmation drilling.

The expressions of interest will be evaluated with the assistance of members of the consulting team and those deemed eligible to submit full proposals will be invited to a bidder workshop at which attendance will be mandatory.

Bidders meeting minimum requirements will be invited to enter into negotiations. Contracts between successful bidders and the AUC will be subject to final approval by the GRMF Oversight Committee.

Recipients of grant awards for surface exploration studies will have 6 months from signing of a contract to mobilize and an additional 9 months to carry out the agreed to scope of work.

Recipients for grant awards for confirmation drilling will have 12 months from the signing of the contract to mobilize and an additional 12 months to complete drilling and testing of the well(s).

Basic Eligibilty for Successful Applicants

Applicants must have a valid concession or a clear indication from the government covering the proposed project area, and exploration license that is convertible to a production license if a discovery is made and a letter from the agency granting the concession that all milestones and work commitments have been duly met. Any concession must be valid for the time period of the proposed activity, i.e. 15 months from the receipt of a grant for surface exploration studies and 24 months from the receipt of a grant award for reservoir confirmation drilling.

Applicants for surface exploration studies must provide detailed geological, geochemical and geophysical studies that justify further surface exploration that will lead to the siting of reservoir confirmation wells. And applicants for drilling grants must have completed all necessary studies that identify viable drilling targets. They must also show progress toward obtaining an off-taker agreement for power generated, should the project be successful.

Applicants for grants will be asked to provide relevant experience and expertise in carry out geo-

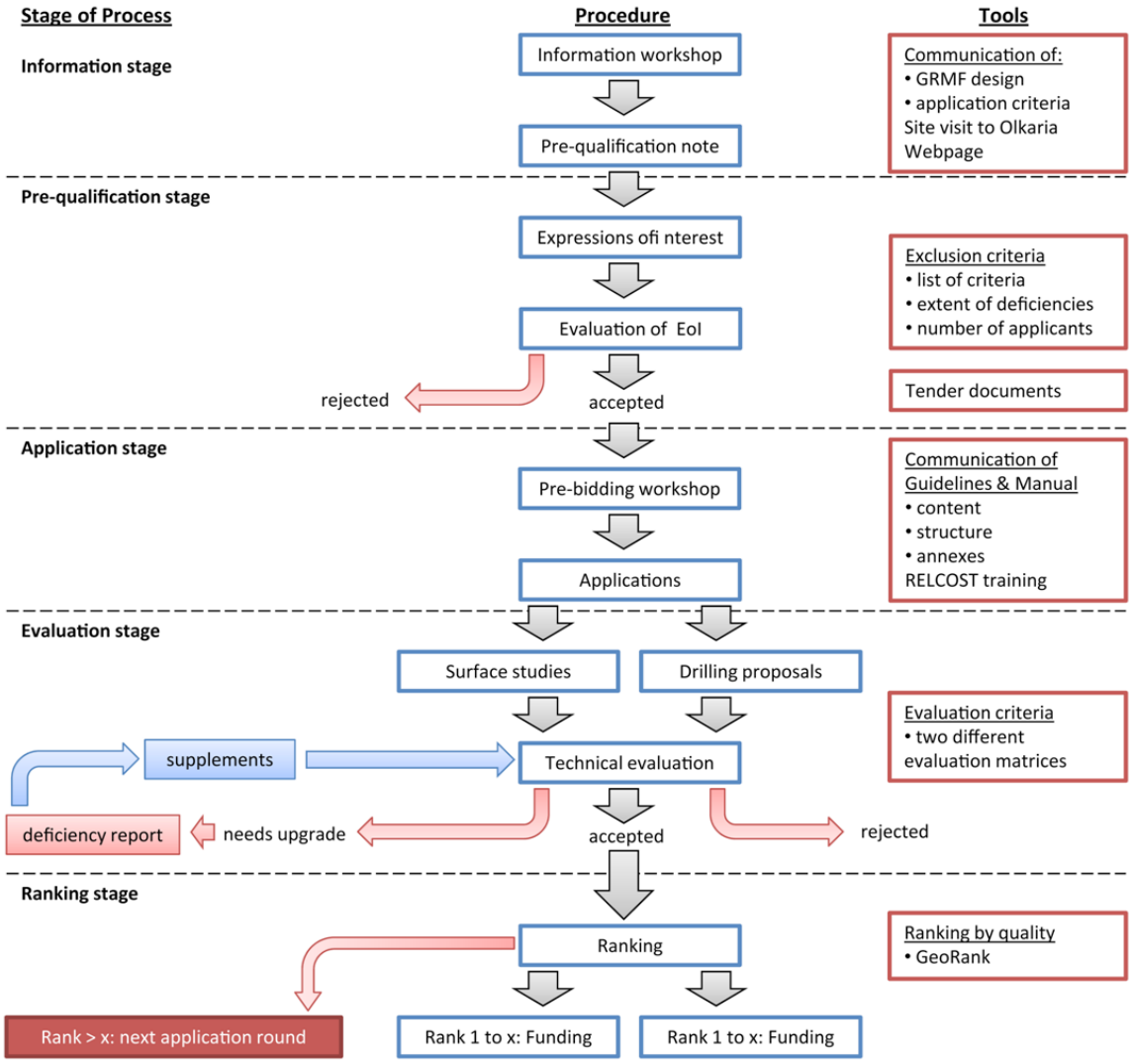

Figure 4. Schematic of the application and award process.

thermal exploration and/or geothermal power project development and financial capability to provide the funds necessary to cover their portion of the proposed scope of work.

In Support of GRMF

The focus of GRMF is upon removing what many if not most potential developers, be they from the private or public sector, believe is the greatest single obstacle to achieving widespread geothermal power generation in East Africa-the upfront cost and risks associated with detailed geological investigations and the drilling of reservoir confirmation wells. However, other obstacles still confront developers of geothermal power in East Africa. These include, the lack of comprehensive institutional, legal and regulatory frameworks in many of the countries spanning the East African Rift zone; a lock of expertise and experience in negotiating complicated contracts, concession agreements and power purchase agreements; conducting project feasibility studies; project implementation planning; financial analysis; preparation of financing packages; bidding and contract preparation.

The ultimate success of GRMF will, to a large extend, depend on how well these other obstacles are addressed and removed.

It is thus critical that other multilateral and bilateral programs be focused on these other critical obstacles to wide spread geothermal development.

To date we have seen increasing interest in filing this gap by among other UNEP who has the management of the ARGeo Technical Assistance program funded by the Global Environmental Fund at some four million dollars US, continuing support from BGR, ICEIDA, KfW and an interest by USAID to focus solely upon capacity building in support of the GRMF. Such support by USAID would provide upstream legal, institutional and regulatory assistance and advice and downstream negotiation assistance, financial analysis, project planning support and contracting assistance to project proponents and/or governmental agencies involved in project implementation.

Summary

A number of critical issues that will have a profound impact upon not only accelerating development of geothermal power in East Africa but expanding developments to all of the countries spanning the East African Rift zone are now being fully addressed through both bilateral as well as multilateral programs that directly target the needs of geothermal developments.

The Geothermal Risk Mitigation Facility, being funded by KfW and the European Infrastructure Trust Fund and implemented by the Infrastructure and Energy Department of the African Union Commission is rapidly becoming the center piece of these activities. And with coordinated support from such entities as UNEP, BGR, KfW, ICEIDA, USAID and other development partners, the opportunity to finally harness the tremendous geothermal potential of the East African Rift zone to meet the energy requirements of the region at last seems to be within reach.