

Call for Expression of Interest

Review of the Conceptual Model of Suswa Geothermal Prospect, Kenya

Project number: ICE23066-1301NDF Kenya/1

Financed under the ICEIDA/NDF Geothermal Exploration Project

Implementing Agency: Geothermal Development Company (GDC), Kenya

Date of CEOI: 4 February 2015

Closing date for receipt of EOI: 18 February 2015, at 16.00 Icelandic time

1. Introduction

The Icelandic International Development Agency (ICEIDA) and the Nordic Development Fund (NDF) are implementing a project to support geothermal exploration and capacity building in East Africa. ICEIDA is the Lead Agency in the Geothermal Exploration Project with joint co-financing of NDF. The project is the initial phase of the Geothermal Compact partnership, initiated jointly by Iceland and the World Bank.

The main objective of the Geothermal Exploration Project is to assist countries in East Africa to enhance geothermal knowledge and capacity in order to enable further actions on geothermal utilization in the respective countries. This includes support to the exploratory phase of geothermal development and capacity building in the field of geothermal research and utilization.

Under the Geothermal Exploration Project, ICEIDA and the Government of Kenya, represented by Geothermal Development Company (GDC), have established cooperation for support to geothermal development in Kenya. The review of the conceptual model of the Suswa geothermal prospect is a part of this cooperation. Iceland GeoSurvey (ISOR) will serve as a technical consultant to the funding and implementing agencies in this project.

ICEIDA, as the Client for the contract, now invites eligible experienced and qualified companies from any country to express interest in being shortlisted to receive Request for Proposals for a review of the conceptual model of the Suswa geothermal prospect. The contract will be mainly financed from NDF's contribution to the project.

2. Selection process

The tendering procedure follows NDF procurement guidelines¹. The procurement will be based on a Quality and Cost Based Selection (QCBS), among qualified shortlisted consulting firms from any country. Up to 6 shortlisted consulting firms with proven ability to conduct the work (based on

¹ <http://www.ndf.fi/fileadmin/resources/documents/NDFGralProcurementGuidelines-GRANTS-December-2009.pdf>

experience of comparable projects, financial capacity and quality of personnel in the relevant fields) may be invited to submit proposals for the Request for Proposals (RFP) that will be issued at a later date.

Interested service providers may associate with other interested firms or individuals in order to enhance their qualifications, in which case they must provide a formal declaration of association.

To be eligible for shortlisting, a firm shall not have conflict of interest related to the assignment and it shall not be under sanctions or debarment by Kenya, Iceland/ICEIDA, NDF or multilateral development banks.

3. Contract type

The work of the consulting firm will be carried out under a *lump sum contract*, under which the services are performed for an all-inclusive fixed price as defined by specific deliverables. Deliverables will include:

- Conceptual model, integrating new and existing data from previous studies. The collection of new surface exploration data will be done by GDC under guidance of the consultant. The conceptual model report shall include:
 - a volumetric assessment of the Suswa geothermal resource,
 - discussion on the hydrological properties of the Suswa geothermal resource and
 - a proposal of 4 drilling targets and corresponding well design.
- Presentation of a revised conceptual model in a technical review meeting.
- Transfer of knowledge and techniques for geothermal surveys and modeling for the implementing agencies.

4. Technical description

4.1. Site to be investigated

Suswa is the southernmost of the Quaternary volcanoes in the Kenya Rift Valley, located about 50 km west of Nairobi. Two calderas are found in Suswa. The larger (outer) caldera is about 10 km by 12 km in diameter whereas the smaller (inner) caldera is about 4 km in diameter.

Surface manifestations found in Suswa include fumaroles, steaming grounds, altered ground and hot grounds. The geothermal manifestations appear to be structurally controlled along faults and ruptures within the volcano. Altered grounds are scattered at the edge of a phonolite block within the inner caldera. Few fumaroles are also found on the southern slope of the volcano.

In March 2013, GDC published a report called *Suswa Geothermal Prospect: Pre-Feasibility Report for Exploration and Appraisal Drilling in Suswa Geothermal Project – A Pre-Feasibility Study Project Report*. The report addresses the regional setting, geology (surface geology, stratigraphy, structures and hydrogeology), geophysics (resistivity model based on TEM and MT data, and seismic surveys) and geochemistry (fumarole samples and soil gas surveys) within an area 25 km by 30 km across. These geoscientific studies are used in the report to present a geothermal model. The main conclusions are as follows: the heat source is associated with a magma chamber beneath the caldera; the recharge of the system is lateral from the rift flanks and axially along the rift floor; the

permeability is assumed to be good; reservoir temperatures are >270°C and the resource potential is >750 MW_e within an area of about 50 km². The locations of four exploratory well sites are proposed in the report.

4.2. Work to be carried out

The consultant will in collaboration with GDC use datasets collected by GDC in the aforementioned studies to synthesize a conceptual model of the geothermal system. The conceptual model shall address the hydrological properties of the system, recharge, heat source(s), boundaries, size and estimated electricity production capacity. The Consultant will propose 4 drilling targets and corresponding well designs based on the conceptual model.

Additional data will be collected by GDC as a part of the review process under the guidance of the consultant. This includes soil gas flux and soil temperature surveys, MT and TEM surveys, a gravity survey, fumarole sampling and structural mapping. It will be the responsibility of the Consultant to ensure that the field data collected in this study are of sufficient quality. GDC equipment will be used for all studies.

The resistivity surveys shall result in a 3D inversion of the MT data and the gravity survey is expected to result in a Bouguer gravity map.

4.3. Capacity building

As a key component of the contract the Consultant shall provide training to technical staff at GDC in surface exploration and conceptual modelling. This entails that GDC scientists will conduct the additional field surveys under the supervision and guidance of the Consultant. The Consultant will, in collaboration with GDC scientists, process, analyse and interpret the results of the different data sets from existing studies in order to revise a conceptual model of the geothermal field. This is done to increase the local capacity for geothermal studies. The participating local professionals will be designated by GDC.

4.4. Schedule of services

The commencement of the contract is scheduled for the second quarter of 2015 and the planned time for completion of services is six (6) months including the final report.

5. Information required from interested parties

ICEIDA and NDF invite eligible consulting firms to express their interest in providing these services. Interested consultants must provide the following information, indicating they are qualified to perform the services.

- a. Declaration of intent to associate (through joint venture or sub-consultancy) , if applicable
- b. Company profile(s) (including number of personnel in the relevant fields)
- c. The lead company references in similar projects (at least three similar projects, involving geothermal surface exploration and conceptual modelling carried out over the last five years)
- d. Description of access to relevant human resources (no CV's should be submitted at this EOI stage)
- e. Financial statements for the last three years or more

- f. Any other information the firms deem necessary to demonstrate that they have the required qualifications and relevant experience to perform the Services

Qualification criteria

- Experience and track record of lead consulting firm in geothermal surface exploration studies
- Availability or access to experienced and qualified human and technical resources in geothermal exploration, including geophysics, geochemistry and geology.
- Experience in capacity building and training in geothermal exploration.
- Experience of geothermal exploration in Kenya and/or East Africa.

6. Contact information and due date

Additional information and clarifications may be requested from the following email address:

iceida@iceida.is

Responses to inquiries will be posted on <http://www.iceida.is/english/partner-countries/regional-cooperation/procurement>. Questions should not be submitted later than 16 February 2015.

Expressions of interest and the associated documentation in English must be delivered by 16:00 hours Icelandic time on 18 February 2015 to the Icelandic International Development Agency to the address below by mail, courier or email. Email delivery attachments should comprise preferably only one file but not more than four separate files in pdf-format.

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