Project Proposal

for
Setting up the Interim Project Coordination Unit (IPCU) of the
African Geothermal Center of Excellence (AGCE)

March 2017
Nairobi, Kenya
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1. Background

1.1. Status of geothermal Development in the world including Africa

Geothermal resource has been identified in more than 80 countries in the world and utilization of the resource has been recorded in more than 60 of these countries. The total installed geothermal electric power by 2015 was about 11 GW world-wide (Bertani, 2015) and 73 TWh/a of heat energy was being used for direct application (Lund, 2015). Electricity is currently generated using geothermal steam in 24 countries spread over all continents.

The African Rift region has geothermal energy resource potential of an estimated output of 20 GW. Kenya has been generating electricity since 1981 and Ethiopia started in 1998. Significant progress has been made in the Africa Region in recent years in terms of development of geothermal resource towards generation of electricity and direct use application. Currently, Kenya is generating about 676 MWe of electricity and 12 MWt for direct use application from geothermal resources. Ethiopia is following Kenya, with a geothermal pilot power plant of total installed capacity of 7.5 MWe and an intensive geothermal resource exploration and development plan.

Exploration for geothermal resources (for electricity production) has also been conducted in other African countries such as Burundi, Comoros Islands, Djibouti, Democratic Republic of Congo, Eritrea, Malawi, Mozambique, Rwanda, Sudan, Tanzania, Uganda and Zambia. These countries are at various stages of geothermal exploration ranging from inventory of hot springs to detailed geoscientific investigations; including drilling of exploratory wells.

Many African countries have also made some direct uses of their geothermal resources. These countries are Algeria, Egypt, Ethiopia, Kenya, Morocco, Tunisia, and Zambia. Hot springs for direct use applications have also been identified in Burundi, Cape Verde, Madagascar, Malawi, Mozambique, Rwanda, Uganda and Zimbabwe.

1.2. Need for Skilled Manpower in Africa for sustainable development of geothermal resource

In the framework of Energy, Climate Change and Sustainable Development Goal, the governments of most African countries are keen and committed to explore and further develop geothermal energy as one of the alternative renewable energy resources in their respective countries. As a result, the countries have formulated energy development strategies towards the objective of fast tracking renewable energy projects including; utilization of geothermal resources for power generation and direct use applications. It is expected that geothermal energy will continue to play an important role in the long term even though other types of energy resources will be developed in parallel. Among the various challenges to achieve this strategic energy development objective in a sustainable manner, is the inadequate skilled manpower in the areas of geothermal science and technology.

More recently in 2015, UNEP/ARGeo conducted a skills gap analysis of geothermal technical personnel, which confirmed an increasing need for geothermal Scientists, Engineers, and Technicians across the region. It is, therefore, essential that African countries develop the
required capacity to maintain high levels of activity in exploration and development of geothermal energy.

Geothermal resource exploration and development is highly dependent on knowledge and skills on geothermal technology. Significant integrated geo-scientific studies and engineering aspects are needed before any economic utilization can be attempted. High levels of uncertainty exist, mainly related to the special characteristics of geothermal resources. This calls for local competence in countries that wish to sustainably utilize geothermal resources in their sustainable development.

Although large investments have been made in training local personnel in geothermal exploration development and production activities, a substantial gap still exists between the demand for increased development of the geothermal resource and the ability of almost all countries in the region to accelerate development in terms of power generation and direct uses. While financing is a major contributor to this situation, lack of adequate local human capital is the main bottleneck for sustainable development of geothermal energy resources in the continent.

1.3. Need for regional Geothermal Center of Excellence for sustainable Geothermal Resource Development in Africa

Countries from other Continents where major geothermal resources development has taken place have provided specialized geothermal trainings for African countries for the last two-three decades. These include Japan, Italy, New Zealand, Iceland and the USA. Most notable in this context is the United Nations University–Geothermal Training Programme (UNU-GTP) in Iceland, with its 6 months diploma training and the MSc and PhD Programmes.

As part of the attempt to address the challenges of inadequate local skilled manpower, UNU-GTP started running shorter courses in Kenya in close cooperation with Geothermal Development Company (GDC) and Kenyan Electricity Generating Company (KenGen); the two Kenyan companies responsible for exploration and development of geothermal energy. Furthermore, the biennial ARGeo conferences have also provided opportunities for shorter courses. There has, however, been a growing sense that further steps should be taken to internalize geothermal training and capacity building within Africa – and notably East Africa.

In this context, the idea of a specific regional geothermal training centre for Africa emanated a decade ago. This idea has been widely discussed among various parties and organizations including Africa Union Commission (AUC), United Nations Environment Programme (UNEP), UNU-GTP, GDC, KenGen, Icelandic International Development Agency (ICEIDA) and the donor community. This discussion led to an agreement and consensus to establish a regional geothermal training centre where the Centre would be based in Kenya mainly due to its leadership in geothermal exploration, development and utilization in Africa. Moreover, (a) the existence of Natural laboratories where the geothermal development value chain can be easily showcased and exhibited and (b) the presence of significant team of geothermal Scientists and Engineers as well as various geothermal equipment and laboratories have witnessed the appropriate decision to host this centre of excellence in Kenya.

Further, a meeting of Heads of State of the Northern Corridor Countries (Kenya, Uganda, Rwanda, South Sudan), in February 2014 attended by President Kenyatta, Kenya requested Kenya to be the home of a regional geothermal centre. In parallel, regional and international
partners continued discussions on the feasibility of such a Centre through various regional and continental workshops and meetings including ARGeo biennial conferences. In 2015 a feasibility study, financed by ICEIDA, carried out in collaboration with stakeholders that included GDC, KenGen, UNEP, and AUC, confirmed that a geothermal training centre in Kenya was feasible and cost-effective.

A validation workshop and stakeholder meeting was organized in Nairobi in August, 2015 for validating the feasibility study and skill gap analysis in the region. This was attended by representatives from all Rift Valley countries and international development partners who endorsed the main conclusions of the feasibility study and skill gap analysis. At this meeting, the name for the centre was proposed to be “The Africa Geothermal Centre of Excellence” or “AGCE” and the decision was made to set up a Steering Committee (SC) to lead and oversee establishment of AGCE in Kenya. The meeting agreed that the SC would be comprised of AUC (Chair), UNEP, GDC, KenGen, UNU-GTP and two representatives from two other countries; with Djibouti and Rwanda nominated for the current period. The record note of the Validation workshop and stakeholder meeting is enclosed in Annex 1.

The stakeholders confirmed the urgent need for establishing such a centre in Kenya, and in order to do so expediently existing infrastructure would be utilized through in-kind support from the Government of Kenya.

1.4. The First Steering Committee Meeting of AGCE, March 2016, Kigali, Rwanda

The first SC meeting of AGCE held in Kigali, Rwanda and chaired by the AUC made the following decisions on the establishment of the AGCE.

- AGCE to be legally constituted under the Kenyan Law and recognized by AUC as Regional Center of Excellence.

- Given that the full establishment of AGCE will take about two years, it was decided to have an interim project Coordination Unit (IPCU) using the existing facilities of GDC and KenGen.

UNEP was tasked to provide technical support and prepare an interim project strategy, with stakeholders, including GDC and KenGen, to advance the AGCE to an operational level. After this interim support arrangement for the first two years, it is expected that the AGCE would be fully established and taken over by the Government of Kenya, through the Ministry of Energy and Petroleum (MoEP). The record note of this Steering Committee meeting is enclosed in Annex 2.

2. Rationale/Justification

The first Steering Committee meeting on AGCE recognized the need for a continuous capacity building, hands on experience and on the job training under the umbrella of the proposed AGCE in order to maintain the momentum of geothermal resource exploration and development in the region. Given the urgent and continuous need for training and in the context of the additional time required to fully establish and legalize the centre under Kenyan Law, the SC meeting agreed to set up an Interim Project Coordination Unit (IPCU) to coordinate training and capacity building using the existing facilities at both GDC and KenGen until a fully fledged and independent management is set up.
The proposed role of UNEP in providing interim support has since been discussed between UNEP and the Kenyan institutions (Minutes of the discussion is enclosed in Annex 3A). As a result, the MOEP voiced support for the proposal that UNEP provides interim technical and management support during the two year establishment phase of the AGCE. At the end of the establishment period, including completion of legal requirements under Kenyan law, AGCE will have been fully established and its future organizational set-up, including hosting arrangements, decided by the Ministry of Energy and Petroleum, which is the official host on behalf of the Government of Kenya.

In this regard, the MoEP fully supported the suggestion that an independent technical UN agency which is ideally positioned to manage and coordinate the Interim Project Coordination Unit (IPCU). UNEP based its headquarters in Nairobi, Kenya and being globally responsible for environment sustainability towards the objective of Sustainable development was seen as best suited to manage and guide the coordination function under the AUC chairmanship of the steering committee of AGCE. On AGCE, UNEP is already doing the coordination role relevant to the Centre leveraging its appropriate linkages with African Union Commission (Chair of the AGCE Steering Committee), various agencies and donors (for resource mobilization etc.). UNEP (through the ARGeo Project) is technically capable of designing the program for the AGCE in consultation with member countries and partners as was the case for developing the skill gap analysis in the region. Thus, UNEP is expected to play a major role in the management of the coordination function of the IPCU of AGCE. UNEP can also provide technical guidance to MoEP in legalization and full establishment of AGCE.

The MoEP advised that a Project Coordinator be appointed under the leadership and guidance of UNEP. As part of their commitment to the establishment and future success of AGCE, both GDC and KenGen have volunteered to second two staff each to work with/in the IPCU during the interim period as required. This is of major importance as much of the intellectual capacity and access to facilities needed for successful training activities rests within these two institutions.

Assuming confirmation of the agreement between Government of Kenya and UNEP, IPCU will, without delay, start mobilizing resources, entering into collaboration agreements and providing training services under the umbrella of AGCE. It will also, from the outset, engage in support for putting in place the entire required institutional and legal framework in order for the AGCE to be fully established.

During the interim setup, it is envisioned that AGCE will focus on demand-driven training services for African countries.

3. Overall and specific objectives of setting up of IPCU

The overall objective to which IPCU will contribute to is to assist African countries to build capacity and skills for geothermal development and utilization on a continuous basis without interruption and delay while awaiting the establishment and legalization of the Centre of Excellence. This will help to maintain the momentum towards acceleration of geothermal development in African countries (both in terms of power generation and for direct use applications).
Specific Objective:

At the end of 2018, the AGCE will have been established under Kenyan law, as a fully functional training and capacity building centre, with a permanent organizational structure, operational capacity for financial management, office and facilities, and be able to show an early track record in effectively and efficiently providing relevant training and capacity building. IPCU’s contribution will primarily be to establish this early track record.

4. Required Inputs

On the immediate operation of IPCU, UNEP will provide personnel, office and administrative support, through its ARGeo project, to lead, coordinate and manage the IPCU for the duration of the interim phase, at no cost to the Government of Kenya.

A project Coordinator will be hired to work under the UNEP ARGeo Project Manager where the cost of logistics and salary of the coordinator and office arrangement will be covered by various partners such as ICEIDA and UNEP.

GDC and KenGen will, each, second two (2) persons to work with a Project Coordinator. The cost on the GDC and KenGen seconded staff will be borne by the respective institutions.

GDC and KenGen will provide their existing facilities for the training activities at a reasonable cost recovery of maintenance of the equipment and laboratories.

A Technical Advisory Team will be recruited on ad hoc basis where their fees will be covered by various support programmes (e.g. ICEIDA, UNEP etc.) both in kind and in cash.

5. Expected output of the IPCU

During the two year period, 2017 and 2018, it is expected that the following outputs will be expected from AGCE, IPCU and Kenyan authorities:

- Business plan for the future operation of the centre, including a financial resource mobilization strategy and other key elements needed for the sustainability of AGCE, accepted by all stakeholders
- Independent legal entity under the Laws of Kenya established and recognized by AUC as a regional centre
- Long term office facilities assigned to the operations of the AGCE.
- Courses to be held
- Curriculum developed for at least 10 courses
- Learning Management System set up
- AGID database updated, upgraded and expanded, e.g., based on expressed interest by various stakeholders for scientific information to be included in the data base.
- Technical advisory committee for the AGCE established
- Updated and reviewed skill gap analysis and training needs plans prepared on the relevant countries, in view of increased knowledge of geothermal potential.
It is expected that by the time of the ARGeo C7 conference in 2018, the Kenyan government will have legally established the AGCE and the proper management structure established, allowing UNEP/ARGeo to handover its technical and managerial support role to the appropriate Kenyan Authorities. It needs to be noted that in the UNEP Concept Note for an extension of the ARGeo project for two years, the sustainability of the project is partly defined by a handover of capabilities to the AGCE.

6. Institutional set up and roles

An interim project coordination unit will be established within UNEP, under the ARGeo project and led and coordinated by the ARGeo program Manager. The IPCU to be coordinated by UNEP ARGeo will report to the steering committee which is under the AUC chairmanship. A Project Coordinator who will be working under the ARGeo Project Manager will be hired, under the UN rules and regulations. The position is expected to be filled in early 2017.

The two staff seconded to the IPCU from each of GDC and KenGen will assist in the day-to-day running of the Centre and provide technical and administrative support to the IPCU. They will work closely with the project coordinator under the coordination of the UNEP ARGeo Project Manager. The two representatives are expected to be either Geoscientists or Engineer with sufficient background in geothermal discipline.

The Steering committee of the AGCE will provide guidance on all matters; approve training plans, budgets and proposals to be made concerning future organization and operations. UNEP will on a regular basis provide reports to the SC and seek guidance from relevant Kenyan authorities, notably the Ministry of Energy and Petroleum, including GDC and KenGen.

The Technical Advisory Team (TAT) will be responsible for curriculum development and quality assurance of the training. Members will be versed in geothermal science, technology development. The members of the TAT will need to have adequate knowledge and experience on scientific and engineering aspects of geothermal, having undergone technical trainings from various institutions and being able to identify and organizing training needs on geothermal for different clients. The team will report directly to the UNEP ARGeo Project office. The organogram in Figure 1 indicates the relationships among the various bodies on AGCE.

Countries are expected either to submit a request for training to the IPCU, through UNEP ARGeo, or to the support programmes that could financially support the training activities under the AGCE. In the earlier case, countries are expected to cover the expense of the training (travel and accommodation) whereas in the later case the support programmes are expected to cover the cost of training including travel and accommodation of trainees.
7. **Risk and Assumptions**

- This interim support will proceed on the assumption that the Government of Kenya as the host, through the MoEP, will provide long term funding for the AGCE, after the two year period,
- As a regional center of excellence, it is also assumed that countries will contribute financially to the center. This of course need to be discussed with member countries during the interim period.
- GDC, KenGen, Member-Countries, bilateral donor agencies and/or private companies are able/willing to provide qualified instructors for training activities and to commit their facilities to training uses, as appropriate and needed.
- For low income countries at an early stage of geothermal development, it will be necessary for a number of years to rely on support from Development Partners to allow candidates to attend training activities.
- Commitment from the Ministry of Energy and Petroleum will be continuous.
8. Activities, time frame and estimated budget

8.1. Activities and Time Frame

The interim support is scheduled to operate from 1 January 2017 to 31 December 2018. Activities and timetable are reflected below.

<table>
<thead>
<tr>
<th>No.</th>
<th>Activities</th>
<th>2017</th>
<th>2018</th>
<th>Expected output</th>
<th>Responsible Organization/Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Approval of the Proposal by the SC and MoEP</td>
<td></td>
<td></td>
<td>Setting up of IPCU approved</td>
<td>AGCE Steering Committee</td>
</tr>
<tr>
<td>2</td>
<td>Preparation of TOR for Project Coordinator and Technical Advisory Team</td>
<td></td>
<td></td>
<td>TOR for Project Coordinator and TAT prepared</td>
<td>UN Environment in consultation and coordination with MoEP, GDC and KenGen</td>
</tr>
<tr>
<td>3</td>
<td>Best practices from different COE</td>
<td></td>
<td></td>
<td>Lessons learnt</td>
<td>AGCE working team and representative from the country</td>
</tr>
<tr>
<td>4</td>
<td>Hiring of project Coordinator and TAT</td>
<td></td>
<td></td>
<td>Project Coordinator and TAT hired</td>
<td>UN Environment in consultation and coordination with MoEP, GDC and KenGen</td>
</tr>
<tr>
<td>5</td>
<td>Inventory of all available equipment facilities in GDC and KenGen</td>
<td></td>
<td></td>
<td>Available equipment, laboratories and facilities identified</td>
<td>GDC, KenGen, MoEP, UN Environment</td>
</tr>
<tr>
<td>6</td>
<td>Launch of the IPCU</td>
<td></td>
<td></td>
<td>IPCU started its function</td>
<td>UN Environment, partners, MoEP/GDC/KenGen</td>
</tr>
<tr>
<td>7</td>
<td>Development of Curriculum for various training activities as per needs and expectations of countries</td>
<td></td>
<td></td>
<td>Curriculum for the courses developed</td>
<td>IPCU with AGCE Technical Advisory Team (TAT)</td>
</tr>
<tr>
<td>8</td>
<td>Cost estimation of courses</td>
<td></td>
<td></td>
<td>Cost of each courses identified</td>
<td>AGCE working team in consultation with UNU-GTP</td>
</tr>
<tr>
<td>9</td>
<td>Logo and website Development for AGCE</td>
<td></td>
<td></td>
<td>AGCE promoted</td>
<td>UN Environment</td>
</tr>
<tr>
<td>10</td>
<td>Produce and Distribute flyers and brochures about AGCE</td>
<td></td>
<td></td>
<td>Awareness created</td>
<td>Interim-Project Coordination Unit (IPCU) of AGCE</td>
</tr>
<tr>
<td>11</td>
<td>First batch of training under AGCE</td>
<td></td>
<td></td>
<td>Training commenced</td>
<td>IPCU (Project coordinator/TAT and rest of the team)</td>
</tr>
<tr>
<td>12</td>
<td>Continuous training activities</td>
<td></td>
<td></td>
<td></td>
<td>IPCU (Project coordinator/TAT and rest of the team)</td>
</tr>
<tr>
<td>13</td>
<td>Process in legalization of the AGCE under Kenya Law</td>
<td></td>
<td></td>
<td>AGCE legalized under Kenya Law</td>
<td>MOEP with technical backstopping of IPCU</td>
</tr>
<tr>
<td>14</td>
<td>Development of business plan for full-fledged AGCE</td>
<td></td>
<td></td>
<td>Business plan for the AGCE developed</td>
<td>IPCU, TAT, Consultant (as required)</td>
</tr>
<tr>
<td>15</td>
<td>Resource mobilization for AGCE</td>
<td></td>
<td></td>
<td>Resource mobilized</td>
<td>Members of AGCE SC, IPCU</td>
</tr>
<tr>
<td>16</td>
<td>Full establishment and legalization of AGCE</td>
<td></td>
<td></td>
<td>Full-fledged AGCE established</td>
<td>IPCU/MoEP/GDC/KenGen</td>
</tr>
</tbody>
</table>
### 8.2. Estimated Budget

Key cost elements for the two years (2017 and 2018) are expected to be as follows:

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Estimated Cost (USD)</th>
<th>Contributing organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Project Coordinator arrangement</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Salary</td>
<td>150,000</td>
<td>UN Environment and MFA-ICEIDA</td>
</tr>
<tr>
<td></td>
<td>B. Travel Costs</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>GDC and KenGen Staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Salary</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Travel Costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Office Facilities, administration etc</td>
<td>150,000</td>
<td>UN Environment</td>
</tr>
<tr>
<td>4</td>
<td>Technical Advisory Team</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Fee</td>
<td>90,000</td>
<td>UN Environment</td>
</tr>
<tr>
<td></td>
<td>B. Travel cost</td>
<td>30,000</td>
<td>UN Environment and other partners (in Kind)</td>
</tr>
<tr>
<td>II</td>
<td>Training Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Cost recovery for equipment maintenance and laboratory consumables</td>
<td>Work in Progress</td>
<td>Countries/support programme that convenes the training</td>
</tr>
<tr>
<td></td>
<td>B. Fee for instructors</td>
<td>Work in Progress</td>
<td>Countries/support programme that convenes the training</td>
</tr>
</tbody>
</table>