AFRICAN RIFT GEOTHERMAL DEVELOPMENT FACILITY PROJECT (ARGEO)

UNEP ARGeo PROGRAM
STATUS AND WAYFORWARD

MESERET TEKLEMRAIAM

UNEP

GEOTHERMAL STAKEHOLDERS Meeting
AUC HQ, ADDIS ABABA
10-11 OCTOBER 2012
ARGeo:


- Proposed in view of the fact that the region:
  
  - Has a large untapped geothermal resource potential,
  
  - Resource is an indigenous, environmentally clean and economically viable, renewable energy resource.
  
  - Its development to date has been constrained by the risks that are associated with RED and the financial risks that are associated with investment in power development projects.
• Promote geothermal resource utilization by removing risks associated with resource exploration and reducing the cost of power development project implementation.

• Planned to deliver a package consisting of financial and technical inputs as means for realizing that promotion.

• Policy support will aim to help in cultivating the recognition that the resource is reliable and indigenous vis a vis other sources of power.

• Utilization of the resource in agriculture and industry will also be promoted.
• Potential number of geothermal fields explored in the region

• Number of geothermal resources sites with confirmed energy potential

• Number of skilled human resources

• Adequate networking and information exchange

• Partnership developed and Synergy and complementarities created
INITIALLY- ARGEO

PROJECT COMPONENTS

Has two components:

- Regional Networking and technical assistance
- Risk Mitigation Fund.

Implementing agencies for this project are:

- UNEP and
- World Bank (WB)

Approved by GEF in 2009.
UNEP ARGeo Program officially started its operation by November 2010 during the Third African Rift Geothermal Conference (ARGeo-C3) held in Dijbouti.
AT PRESENT: UNEP – GEF FUNDED ARGEO PROGRAM

• Regional Network: Managing a geothermal information system, capacity building and awareness raising.

• Technical Assistance: (a) Surface investigations to confirm the presence of utilizable geothermal resources. (b) Sector policy advice and promotion of institutional structures and legal and regulatory framework.

ESTABLISHED OPERATIONAL LINKAGE WITH AUC-KFW GRMF
At Present, ARGeo TARGET COUNTRIES

- Eritrea
- Ethiopia
- Kenya
- Rwanda
- Tanzania
- Uganda

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Partners of ARGeo

- AUC- KfW
- ICEIDA
- BGR
- USAID
- UNU-GTP
- IAEA and ARGeo Member Countries

Meseret Teklemariam, UNEP
ARGeo implementation will be preceded by an initial project development stage which will identify:

- Most suitable resource areas for support,
- Survey the already existing human, institutional and infrastructural capacities in the region,
- Assist with the creation of the collaborative institutional network and database,
- Survey the policy and legislative regime in the region.
**ORGANIZATIONAL CHART OF ARGEO**

**UNEP/DTIE**
(Implementing Agent)

**UNEP/ROA**
Project Management Unit (PMU)
Executing agent for Regional Networking &TA

**ARGeo Steering Committee Members (SC)**
ARGeo Countries (NPD), UNEP, AUC-KfW, SREP, USAID, Donors and Supporters

- Overall guidance to partner institutions and monitoring of progress and performance
- Consider applications for new member countries of ARGeo

**ARGeo Technical Advisory Team (ATAT)**
Independent and neutral geothermal experts

- Administrative work
- Regional knowledge sharing
- Screens country specific and regional TA proposals
- Management of ATAT

**NPMU-Rwanda**
**NPMU-Eritrea**
**NPMU Ethiopia**
**NPMU Kenya**
**NPMU Tanzania**
**NPMU Uganda**

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PROGRESS ON UNEP ARGEO PROJECT

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Regional Networking, Information Systems, AC and CAPACITY BUILDING
Regional Networking, Information Systems, AC and CB

• Updated Country’s Status Report in the EAR
• Inventory of Human Resources, Equipment and Institutional Set Up
• Developed East African Geothermal Database
• Technical support in capacity building through UNU-GTP/KENGEN/GDC training program
• Created awareness to DM of the ARGeo member countries
• Facilitated and supported establishment of EAGA

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Partnership and South-South Cooperation

- Communicated with various partners such as BGR, ICEIDA, UNU-GTP, UNIDO, BRGM, USAID etc..

- Agreed to establish agreement in principle with GDC and KENGEN to support ARGeo in Regional Networking, awareness creation capacity building, technical Assistance
UNEP ORGANIZED A SIDE MEETING WITH MINISTERS AND DM ON ARCEO IN ABU DHABI (JULY 2011)
HELD ARGeo Ministerial Meeting (September 2011).

Awareness created about ARGeo Project Status and way forward

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GEOTHERMAL ENERGY – POWER GENERATION AND DIRECT USES – A CASE FOR OSERIAN FLOWERS IN KENYA

Meseret Teklemariam, UNEP
VISIT to MENENGAI Geothermal Field, Partners and ARGeo member countries (September 2011)
Facilitated Late Ethiopian PM Visit to the Olkaria Geothermal Power Plant, Kenya (February 2012)
ARGeo Nairobi Ministerial Resolution

- ARGeo is recognized as an intergovernmental coordination and information forum facilitating and coordinating sustainable use and development of Geothermal Resource under the Guidance of AUC.

- UNEP supports AM Countries in: (i) RN on Geothermal Agencies, (ii) undertake CB, and Surface exploration studies which would minimize the financial and technical risk of the drilling activities to follow with the GRMF.

- ARGeo ensures a well integrated regional geothermal exploration and development approach which will cooperate closely with AUC-KfW GRMF.

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Held Discussion and reached in principle agreement between AUC and UNEP

AUC and UNEP Working Session-July and October 2011; April and August 2012
TECHNICAL ASSISTANCE
Surface Exploration studies
## STATUS OF GEOTHERMAL E&D

<table>
<thead>
<tr>
<th>Countries</th>
<th>Reconnaissance</th>
<th>S. Detailed</th>
<th>Detailed</th>
<th>Drilling</th>
<th>Feasibility</th>
<th>Power Development</th>
<th>Remark</th>
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<tr>
<td>DRC</td>
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<td>X*</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>* Not F. plant 200KW</td>
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</table>

= Reconnaissance  
= Semi-Detailed  
= Detailed  
= Power generation

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STRATEGY FOR EXPLORATION AND DEVELOPMENT OF GR IN EARS

Meseret Teklemariam, UNEP
## STRATEGY FOR EXPLORATION AND DEVELOPMENT IN EARS

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<tr>
<th>Countries</th>
<th>Reconnaissance</th>
<th>S.Detailed</th>
<th>Detailed</th>
<th>Drilling</th>
<th>Feasibility</th>
<th>Power Development</th>
<th>Remark</th>
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<tr>
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<td>X</td>
<td>X</td>
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<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ALID (PP)</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>450 MWe</td>
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<td>Kenya</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>Pilot Plant + 300MW</td>
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<td>X</td>
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<td>50 -100 MW</td>
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<td>X</td>
<td>X</td>
<td></td>
<td>-</td>
<td>-</td>
<td>* Not F. plant 200KW</td>
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</table>

- Detailed investigation
- Power Generation

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• Guidelines for Preparation of Request for FTA: What we know, what we don’t know and how to fill the gap

• Selection criteria for evaluation of proposals

• UNEP provided full support in preparation Project Proposal From Uganda, Kenya, Eritrea and Ethiopia

• Exchanged ideas and views with member countries on sub.proposal
Tendaho Geothermal Prospect, Ethiopia

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Alid Geothermal Prospect, Eritrea
Silali Geothermal Prospect, Kenya
Kibiro Geothermal Prospect, Uganda
<table>
<thead>
<tr>
<th>Country</th>
<th>Geothermal Prospect</th>
<th>Developer</th>
<th>Status of prospects</th>
<th>Request for</th>
<th>Drilling Activity</th>
<th>TAF (Market, regulatory): Feasibility</th>
<th>Potential electricity generation (MWe)</th>
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<td>Ethiopia (7.2 MWe)</td>
<td>Corbeti</td>
<td>Private (RG)</td>
<td>SE completed</td>
<td>SE</td>
<td>Drilling</td>
<td>Eligible to GRMF</td>
<td>450</td>
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<td></td>
<td>Tendaho</td>
<td>Public</td>
<td>Limited SE required (more geophysics)</td>
<td>✓</td>
<td></td>
<td>Institutional and Regulatory Framework; Draft Feed in Tariff; PPA</td>
<td></td>
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<tr>
<td></td>
<td>Dofan-Fantaale</td>
<td>Private (UK, COSZUS)</td>
<td>Detailed SE is required</td>
<td>✓</td>
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<td></td>
<td>Abaya</td>
<td>Private/public</td>
<td>Detailed SE</td>
<td>✓</td>
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<tr>
<td>Kenya (209 MWe)</td>
<td>Lorgonant</td>
<td>Private (SKM)</td>
<td>SE Completed</td>
<td>✓</td>
<td>Eligible to GRMF</td>
<td>IF in place.. Feed in tariff about BUS cents/KWh</td>
<td>800</td>
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<tr>
<td></td>
<td>Silali-Bogoria</td>
<td>Public</td>
<td>Limited SE (Seismics)</td>
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<td></td>
<td>Suswa</td>
<td>Private</td>
<td>Detailed SE</td>
<td>✓</td>
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<tr>
<td>Rwanda</td>
<td>Karismbi (Giseny')</td>
<td>Public</td>
<td>Limited SE and eligible for GRMF</td>
<td>✓</td>
<td>Eligible to GRMF</td>
<td>IF &amp; RF yet to be revised. Draft Feed in tariff is in place</td>
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<td></td>
<td>Bugarama</td>
<td>Public</td>
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<td>Kibiro</td>
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ARGeo+ GRMF +ICEIDA+BGR
Public developers are encouraged to

USAID+BGR, EU funded Proj.
WB, AfDB, EIB, KFW etc.

YEAR 1: 2012
217 MWe Risk associated with EXPLoration is mitigated; PPP/IPP

Year 5: 2016
+500 MWe

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ENGAGE INVESTORS WHO WILL INSTALL WELLHEADS FOR EARLY GENERATION

**Importance**
- Provide power shortly after drilling
- **They are cheaper than conventional power plants**
- Provide revenue early
- Improve the profitability of a project

**Characteristics**
- Typical Sizes – 5-10 MW
- **Containerized - portable**
- Mounted on the well
- Take 9 months to manufacture ship and install
- Cost **US$ 1.5 million /MW**
ARGEO SURFACE EXPLORATION STUDIES (SES) PROGRAM

Implementation of Surface Exploration Studies: Monitoring, Evaluation etc..

First Review of Projects

Final selection and ranking

Project Pipelines

GRMF

Investment Projects

500 MWe
NEXT STEPS

- Signing an MOU between UNEP and AUC
  - Define joint implementation modality of the two programmes (GRMF-ARGEOP-RGP)
  - Organize ARGeo Biennial Conferences
  - Start implementation of project components
    - Set up National Project Management Unit
    - Regional Geothermal Technical Advisory Body
    - Co-organize the biennial conference of ARGeo-C4
    - Customized (Tailor made) Training Programmes for experts and decision makers on Geoscientific studies, Project planning and Management and Database Management (TWO Short course programmes during ARGeo-C4 conference).
4th African Rift Geothermal Conference (ARGeo-C4)

Geothermal: Solution to Africa’s Energy Needs

19-25 November, 2012,
UN Headquarters, Nairobi, Kenya

Hosted by the Government of Kenya; Organized by Geothermal Association of Kenya (GAK) and UNEP

Endorsed by: International Geothermal Association (IGA)

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ACTIVITIES UNDER THE UMBRELLA OF RG

ARGeo-C1
Ethiopia (2006)

ARGeo-C2,
UGANDA (2008)

BIENNIAL ARGeo CONFERENCES

ARGeo-C3,
DJIBOUTI (2010)
THREE SHORT PRE-CONFERENCE TRAINING COURSES

SC 1: Geothermal Exploration Techniques and Drilling technology:

Geothermal Experts for Execution of projects
SC 2: Planning, Managing and Financing of Geothermal Projects

FOCAL POINT
NATIONAL PROJECT MANAGEMENT UNIT
SC 3: East Africa Geothermal Database

Network Hubs among East African Countries
Evaluation of technical content and quality of project proposals and results of studies will be performed by well known neutral international and regional experts.
CONCLUSION

- Overall strategy to accelerate geothermal development in the countries of EARS is to adopt a regional geothermal resource development approach

- Harmonization, coordination and synergy of various geothermal programmes in the region will significantly contribute to accelerate GERD by reducing cost, increase efficiency and quality of the work.

- Holistic Utilization of Energy resource (both PG and DU) can create wealth, tackle food insecurity and boost socio economic development.

Meseret Teklemariam, UNEP
People ask for a clean and renewable energy.

Earth has the answer.

Geothermal Energy
FROM THE HEART OF THE EARTH
THANK YOU

CONTACT

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Email: Meseret.Zemedkun@unep.org