Role of UNEP in accelerating Developing of RE including Geothermal Resources in EAR

MESERET TEKLEMARIAM ZEMEDKUN
EESI – Geothermal Briefing
16 March 2016
Capitol Visitor Center, Washington DC
USA
PRESENTATION OUTLINE

• KEY ISSUES (CONTEXT)

• RE in Africa and opportunities for Development

• ROLE OF UNEP In ED IN AFRICA

• UNEP- African Rift Geothermal Development Facility Programme (ARGEo)
Africa is undergoing a sustained period of economic growth and transformation. Its population is growing rapidly, and its economies are developing and diversifying.

The next 20 years will see Africa reaping extensive benefits from global developments in the field of energy.

Opportunities exist for Africa to realise the economic growth and increased living standards that go hand in hand with access to modern energy sources and systems.

A Prosperous Africa Based on Inclusive Growth and Sustainable Development
Share of population without electricity access

Future access situation: BAU scenario
Energy Investment Gap

The graph illustrates the energy investment gap, showing the current growth based on historic trends, the pathway to 100% access, and PIDA projections at 6% growth per year. The graph highlights the significant gap in access towards 2030.
Renewable Energy Potential in Africa

- Africa is endowed both with vast non RE (oil, gas and coal) and RE (IRENA 2011).
- About 1850 TWh hydropower,
- More than > 20 GW Geothermal
- Abundant solar 155-170,000 TWh/yr and
- Wind (5000-7000 TWh), and
- Biomass 3-13.6
Development Objective

Accelerate the growth of markets for RE and EE technologies and services

Overall Goal

Increase contribution of RE to poverty elimination, economic growth, and sustainable development
Opportunities for ED in Africa

- A variety of Renewable and NR Energy Sources
- **Increased National and Regional Level Policy Commitment**
- Climate Related Financing (SREP, CIF, GC etc..)
- Emerging Financiers (e.g. BRICS)
- Various Global, Continental and Regional Energy Programmes/Projects (SE4ALL, GGD, PIDA, AREI, US Power Africa, ARGeo, GRMF etc)
UNEP is the lead organization to coordinate environmental matters within the United Nations system. We produce environmental assessments and analyses, norms, guidelines and methods for use by stakeholders looking for guidance on how to effectively manage the environment for their sustainable development and economic growth.
The Energy branch leads UNEP’s work on climate change mitigation by addressing the environmental consequences of energy production and use.
UNEP’s Work on Climate Change

**Mitigation**
Support countries to make the transition onto low-emission development pathways and a **Green Economy** by assessing emissions reduction opportunities, phasing out obsolete technologies, facilitating access to finance (including stimulating private sector involvement) and promoting the scaling up of clean and renewable energy sources and energy efficiency through policy, technology and investment choices.

**Adaptation**
Assist countries to reduce their vulnerabilities and build resilience to the impacts of climate change by building and strengthening national institutional capacities for vulnerability assessments, and by supporting national efforts to incorporate ecosystem-based approaches into country development planning and policy-making, consistent with country priorities and ownership.

**Redd**
Support countries to develop transformative REDD+ strategies, finance approaches and institutions, and test innovative REDD+ pilot projects that include multiple benefits in areas such as biodiversity and livelihoods. This work includes promoting consultations among stakeholders, including indigenous peoples and forest dependent communities and engagement with the private sector to demonstrate the potential for REDD+ To be a catalyst for the Green Economy.

**Science**
Draw on strengths as a science-based organization, facilitate the development of climate change assessments, including for new and emerging issues, and climate impacts research to inform policies and support countries in the development of their own climate expertise.

**Outreach**
Improve the general understanding and awareness of climate change, ensuring that national policy makers and negotiators, trade unions, youth, civil society and the private sector have access to relevant, clear and understandable climate change information.
UNEP supports countries through the combination of three areas of intervention:

- Providing sound policy advice for strengthening policy and institutional frameworks
- Catalyzing public and private finance for clean energy
- Stimulating the uptake of low GHG and climate friendly technologies
ENGAGEMENT IN UNITED NATIONS PROCESSES

- Sustainable Energy for All Initiative
- Climate Change Negotiations conducted under the UNFCCC
- Agenda 2030 on SDG’s Adopted in September 2015
- Launch of AREI in December 2015 (COP 21)
UNEP’s Work on Sustainable Energy FOR ALL

UNEP hosted the “Africa roll-out of the International Year of SE4All” in February 2012 to examine how to achieve the objective of SE4ALL. UNEP is also undertaking a number of Energy development activities that contribute to the three goals of the Sustainable Energy for All and specifically EE.
UNEP’s contribution to countries through SDGs

UNEP plays a role in effective integration of environmental sustainability in SDGs through its capacity to produce science-based products, including assessment reports and technical guidelines; and

Development of RE resource in general and geothermal resource in particular is a critical part of addressing the prevailing energy poverty in Africa which in turn makes a major contribution to the fulfillment of a number of SDG’s
UNEP has a number of on-going global, continental and regional Energy related projects. Among others, a GEF Funded Regional African Rift Geothermal Project can be a good example.
AFRICAN RIFT GEOTHERMAL DEVELOPMENT FACILITY
EAST AFRICAN RIFT SYSTEM - THE PROBLEM

Extends about 6500 Km from the Dead Sea (North) to Mozambique (South)

Huge Geothermal Resource with Estimated Potential of > 20,000 MWe
OVERALL OBJECTIVE: UNEP-ARGeo project encourages both Private and Public developers to accelerate development of geothermal resource in the East Africa Region.

ARGeo provides Fast, targeted and demand driven technical and financial support to East African Countries to fast track the development of huge and untapped geothermal resource for power generation and direct uses.

It brings solution through mitigation of risks associated with resource exploration and catalyzes investment.

www.theargeo.org
GEF-FUNDED ARGeo TARGET COUNTRIES

- Uganda
- Tanzania
- Rwanda
- Kenya
- Ethiopia
- Eritrea
ARGeo: Project Components

SUPPORTED ACTIVITIES

- Technical Assistance for Surface Studies
- Regional Networking, Information Systems
- Awareness Creation
- Capacity Building
- Policy Advice
PARTNERS

• Africa Union Commission-German Development Bank

• Icelandic International Development Agency (ICEIDA)

• German Federal Institute of Geosciences and Natural Resources (BGR)

• United Nations University-Geothermal Training Programme (UNU-GTP)

• US-Power Africa- East African Regional Programme
UNEP-ARGeo Spearheads Efforts in CIFGD
With
MEMBER COUNTRIES with PARTNERS
Created Awareness to Policy and Decision makers
Ministers of ARGeo member countries

UNEP discussing with Various PM, Ministers of ARGeo member countries
Countries own and lead the project - UNEP gives service as per needs and expectations of countries.
Completed two project pipelines (Kenya) and Tendaho (Ethiopia), which will be used for future investment and development and to be financed through AUC-KfW Geothermal Mitigation Facility, DFID and EU.

Investment and development banks (KfW and AfD) developed interest to invest in these two confirmed geothermal resource sites.
Other three Geothermal Projects

ERITREA  
UGANDA  
TANZANIA  
Rwanda

CATALYSING INVESTMENT FOR GEOTHERMAL DEVELOPMENT
Developed ARGeo East African Information Database

About the ARGeo-GI Database
The ARGeo-GI database provides an overview of geothermal development in the African region by storing information on geothermal projects, their progress and funding, as well as related information on human resources capacity and equipment available or required in the countries concerned. The AGI database is not designed to store actual geothermal research or production data. The structure of the database is simple and is easy to use.

Filter by country (Dropbox)  Open the database  New or updated Entry (Dropbox)  Logout

About the ARGeo Project
The African Rift Geothermal Development Facility (ARGeo) Project is a GEF-funded project implemented by United Nations Development Programme (UNEP).

ARGeo project aims at supporting the development of the untapped geothermal resource potential in the Eastern African region with main objective of reducing the risks associated with the resources exploration. ARGeo also aims to reduce greenhouse gas (GHG) emissions by promoting the adoption of geothermal energy in the region. ARGeo will also help demonstrate that the resource is reliable, cost effective and indigenous as compared to other sources of power in the Eastern Africa region. The utilization of the resource in agriculture and industry will also be promoted.

UNEP ARGeo created operational linkage and coordination with the African Union Commission (AUC)-Geothermal Development Bank (KDF) project on Geothermal Risk Management Facility (GFRM). UNEP has also other partners such as Icide (International Geothermal Energy Agency), German Federal Institute for Geosciences and Natural Resources (BGR), United Nations University-Geothermal Training Programme (UNU-GTP) and nine ARGeo member countries. The GEF-funded ARGeo project has six member countries, namely: Ethiopia, Kenya, Tanzania, Rwanda and Uganda.

The Project has two main components:
- Regional Networking, Information System, Capacity Building and Assessment Ceneter, the database is developed under this component
- Technical Assistance in terms of surface exploration studies.

UNEP and ICEIDA Launching AGID,
29 October 2014, Arusha, Tanzania

www.agid.org
Spurred Geothermal interest through organization of Biennial Geothermal conferences

- One of the UNEP ARGeo Project Biennial Geothermal Conferences being implemented under the “Regional networking, information systems, capacity building and awareness creation”.

- Example: ARGeo-C4 brought together more than 600 international and regional delegates from 35 countries that includes policy makers, technical experts as well as developers and financiers.

In Collaboration with GoK (GDC, KENGEN ..)
Strengthened institutional and infrastructural capacities through trainings and hands on experience (e.g. November 2012, 2014)

Three parallel Short Course trainings:

(A) Geoscience Exploration Techniques, Drilling Technology and Reservoir Engineering facilitated by University of Auckland, New Zealand;

(B) Planning, Managing and Financing of Geothermal Projects facilitated by USAID and

(C) Geothermal Database Management for East Africa facilitated by ISOR though the support of Icelandic International development Agency.
Provides matured institutional support to a more sustainable and institutionalize process of creating Africa Geothermal Center of Excellence (AGCE).

DONORS and DEVELOPMENT PARTNERS

Representatives from 13 African Countries

Determined and identified needs and expectations of countries
### Scenarios for GED in the region (AMC)

<table>
<thead>
<tr>
<th>Country</th>
<th>Geothermal Prospect</th>
<th>Developer</th>
<th>Status of prospects</th>
<th>Request for Drilling Activity</th>
<th>TAF (Market, regulatory, Feasibility)</th>
<th>Potential electricity generation (MWe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia (7.2 MWe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Corbett</td>
<td>Private (RG)</td>
<td>SE completed</td>
<td>Subjected to Drilling</td>
<td>Institutional and Regulatory Framework; Draft Feed in Tariff, PPA</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>Tenda</td>
<td>Public</td>
<td>Limited SE required (more geophysics)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dallol</td>
<td>Private</td>
<td>Limited SE is required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kenya (380 MWe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bogoria</td>
<td>Public, Limited SE</td>
<td></td>
<td>Subjected to Drilling</td>
<td></td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>Elgeyo</td>
<td>Public</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rwanda</td>
<td>Karisimbi (Gisenge)</td>
<td>Public</td>
<td>Limited SE and eligible for GRMF</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Gikongoro</td>
<td>Public</td>
<td></td>
<td>Subjected to Drilling</td>
<td>Draft Feed In Tariff</td>
<td></td>
</tr>
<tr>
<td>Tanzania</td>
<td>Mikeno</td>
<td>Private</td>
<td>Limited SE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rufiji</td>
<td>Private (Local P)</td>
<td>Limited SE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uganda</td>
<td>Kibale</td>
<td>Public</td>
<td>SE required</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Katwe</td>
<td>Private (PERTAMINA)</td>
<td>Limited SE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eritrea</td>
<td>West</td>
<td>Public</td>
<td>Limited SE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suadhe Dubbi</td>
<td>Public</td>
<td>Limited SE</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ARGeo, ICEIDA, BGR, JICA**

**GRANTS**

**GRMF (40%)60%?**

**PPA/FIT**

**PRG**

Public developers are encouraged to

**Year 1: 2013**

- 217 MWe

- Risk associated with Exploration is mitigated; PPP/IPP

- Meseret Teklemariam, UNEP

**Year 5: 2017**

- +500 MWe

- USAID+BGR, EU funded Proj

- WII, ARDDE, El, KfW etc.
CONCLUSION

- No meaningful Sustainable development can be achieved without the Sustainable Energy Resources.

- Provision of sustainable energy including Geothermal energy is one of the main inputs to climate change challenges as well as environmental degradation.

- Africa’s huge and untapped RE resources including Geothermal can immensely contribute to the energy needs of the continent that would make significant contribution to poverty alleviation and sustainable development.

- Existing and newly developed global, continental and regional energy programmes and initiatives on SE dev. In Africa can be used as a vehicle to assist countries to develop their energy sector on a sustainable basis.

- Africa needs to seize opportunities of SE4All, SDGs, and the launch AREI to accelerate development of GE resources in the continent.

- Private sector mobilization and investment is important to scale-up success stories for maximum impact.
THANK YOU

CONTACT

MESERET TEKLEMARIAM
UNEP/ROA
Email: Meseret.Zemedkun@unep.org