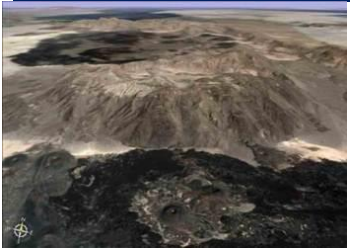


UNEP - UNEP-African Rift Geothermal Development Facility



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)**

•

KEY ISSUES: CONTEXT

- **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**



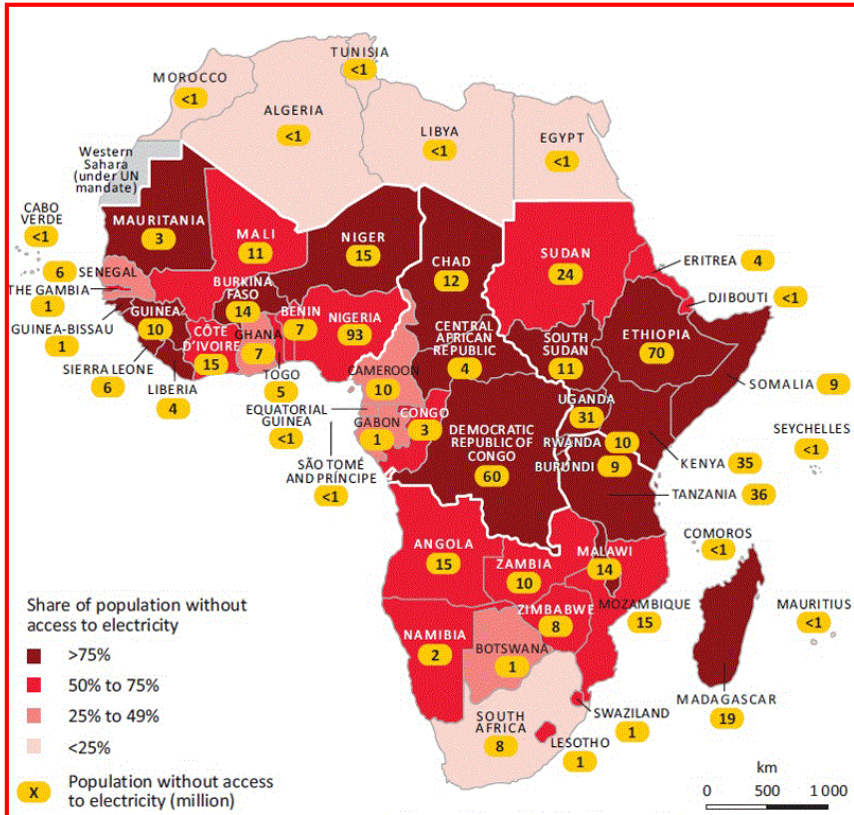
A Prosperous Africa Based on Inclusive Growth and Sustainable Development



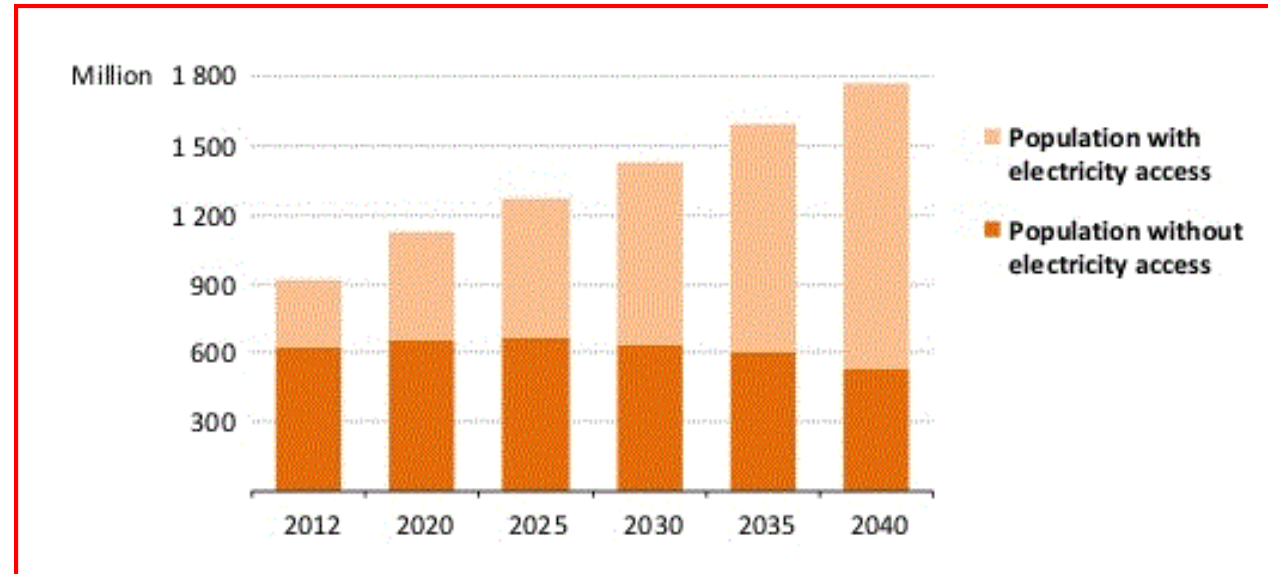
CURRENT SCENARIO

Energy Access Gap

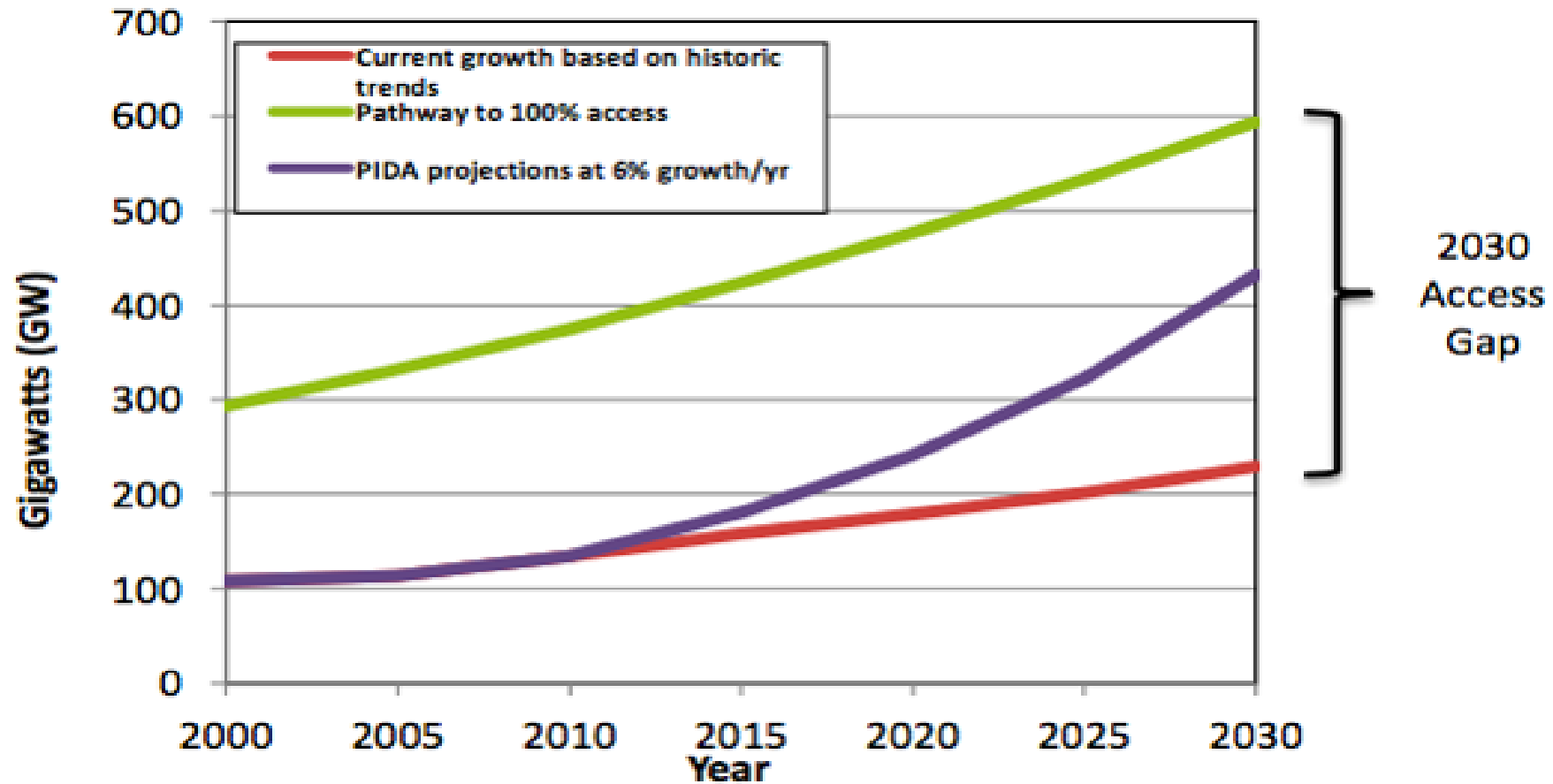
Share of population without electricity access



Future access situation: BAU scenario



Energy Investment Gap



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



Source: IRENA analysis based on the Global Atlas

Goals of Africa RE initiative

Development Objective

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

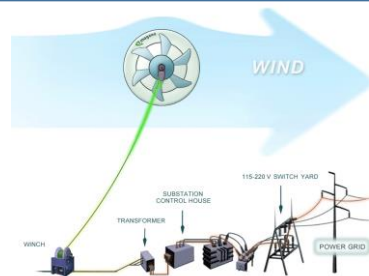
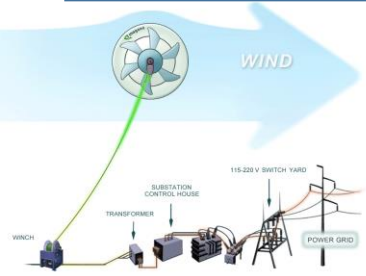


Overall Goal

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)



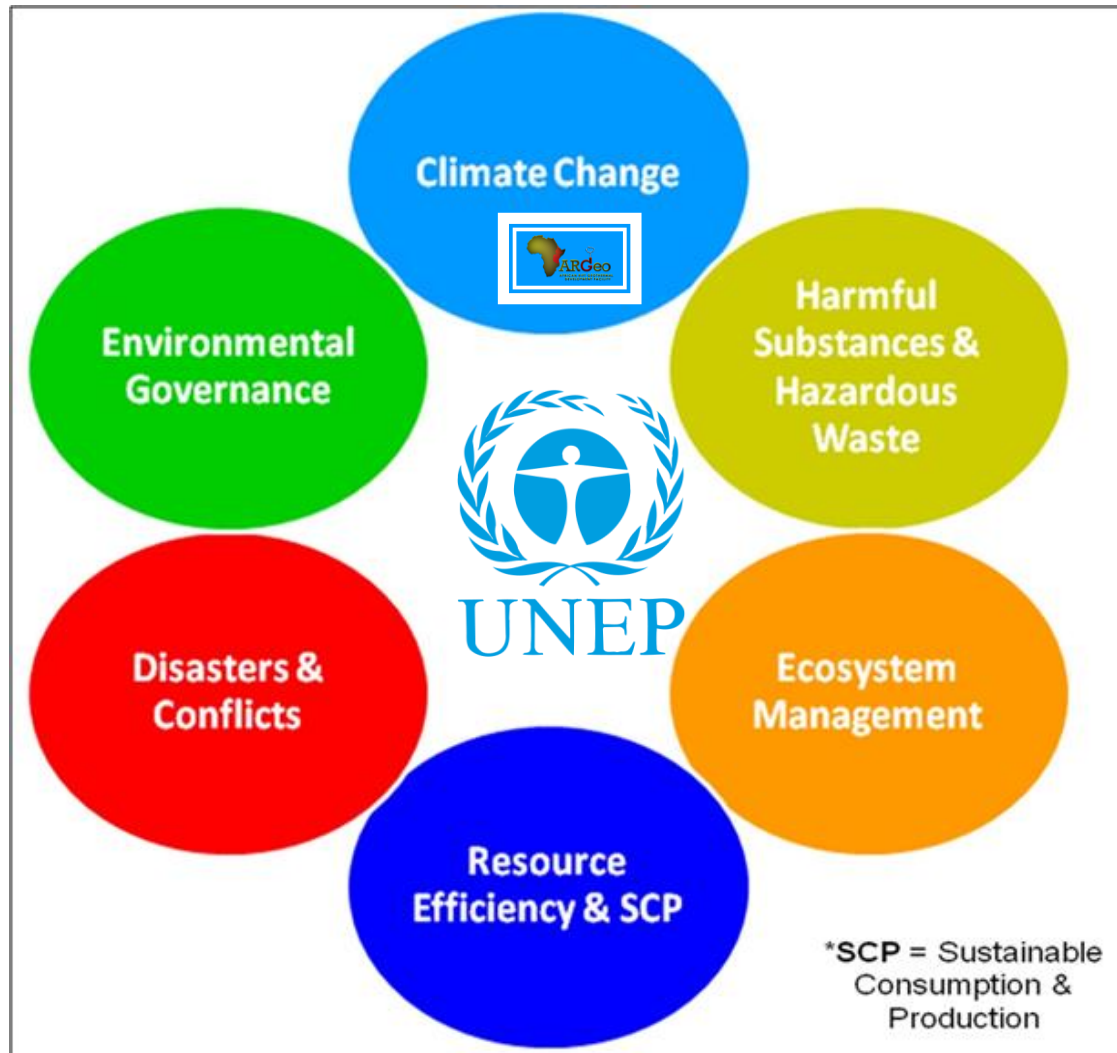
ROLE OF UNEP



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



UNEP'S seven THEMATIC AREAS



7 Divisions and Six Regional OFFICES

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.

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.

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.

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 SUPPORT TO COUNTRIES In E. Sector

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

SUPPORTER OF
2012 INTERNATIONAL YEAR OF
SUSTAINABLE ENERGY
FOR ALL



United Nations
Framework Convention on
Climate Change

- 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



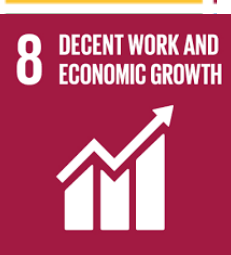
UNEP hosted the “Africa roll-out of the International Year of SE4All” in February 2012 to examine how to achieve the objective of SE4ALL, UNEP is also undertaking a number of Energy development activities that contribute to the three goals of the Sustainable Energy for All and specifically EE.



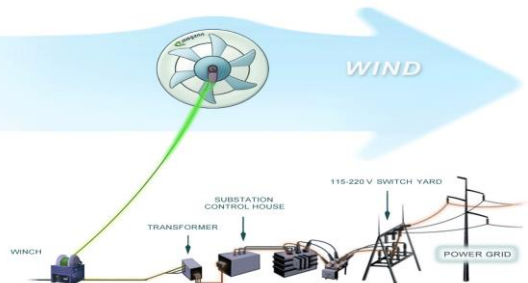
UNEP's contribution to countries through SDGs

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



Energy Related Projects

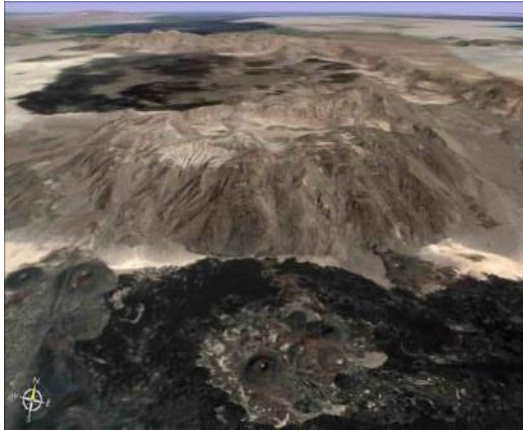


-UN

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.

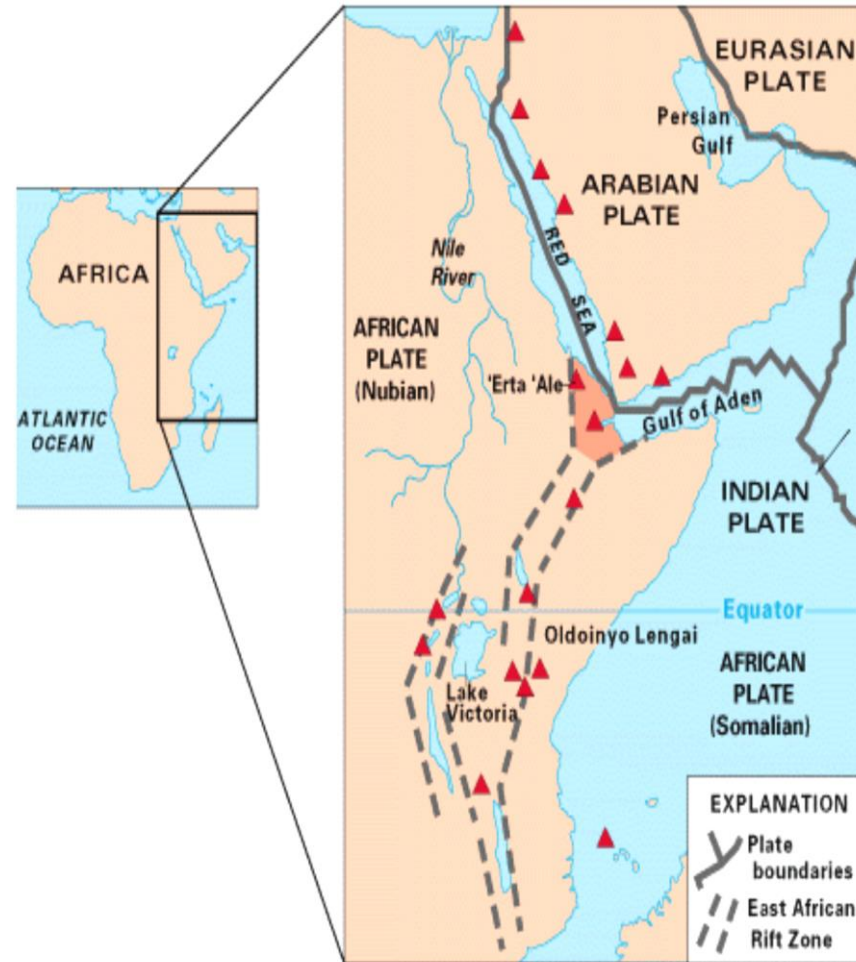
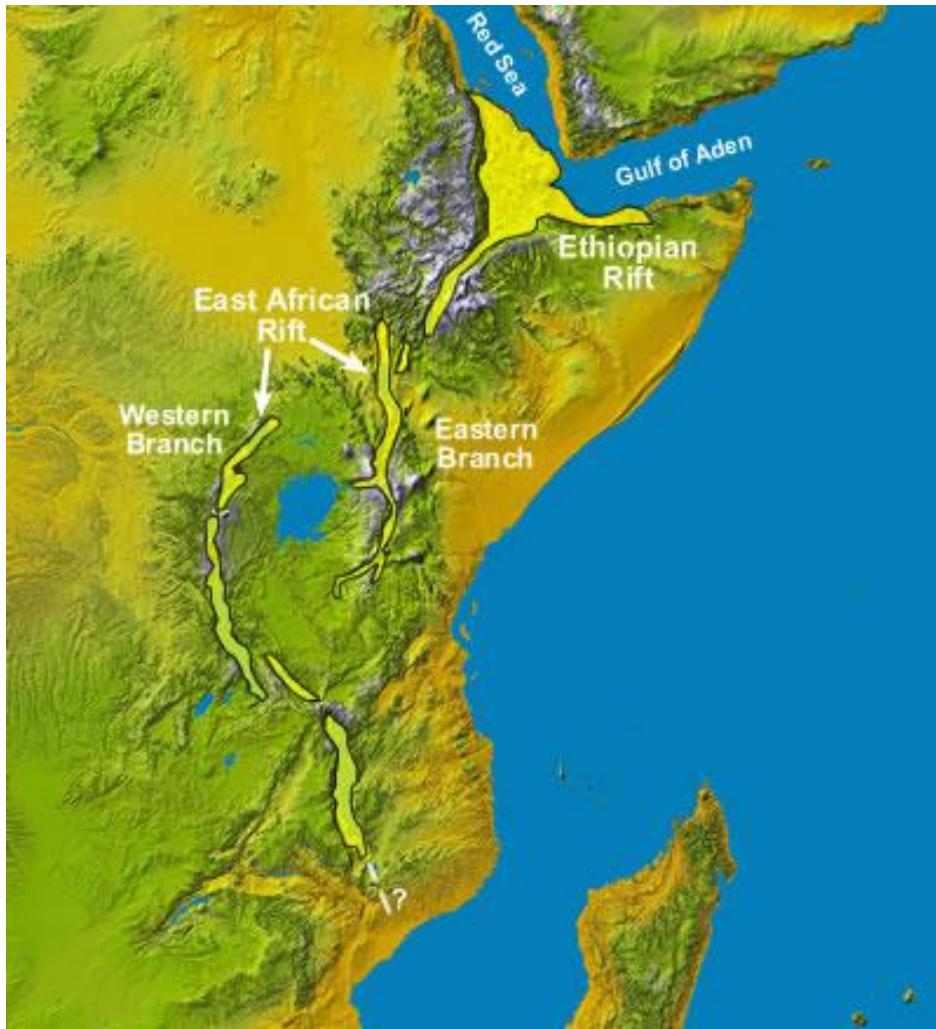


GEF Funded UNEP ARGeo programme



AFRICAN RIFT GEOTHERMAL DEVELOPMENT FACILITY





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.

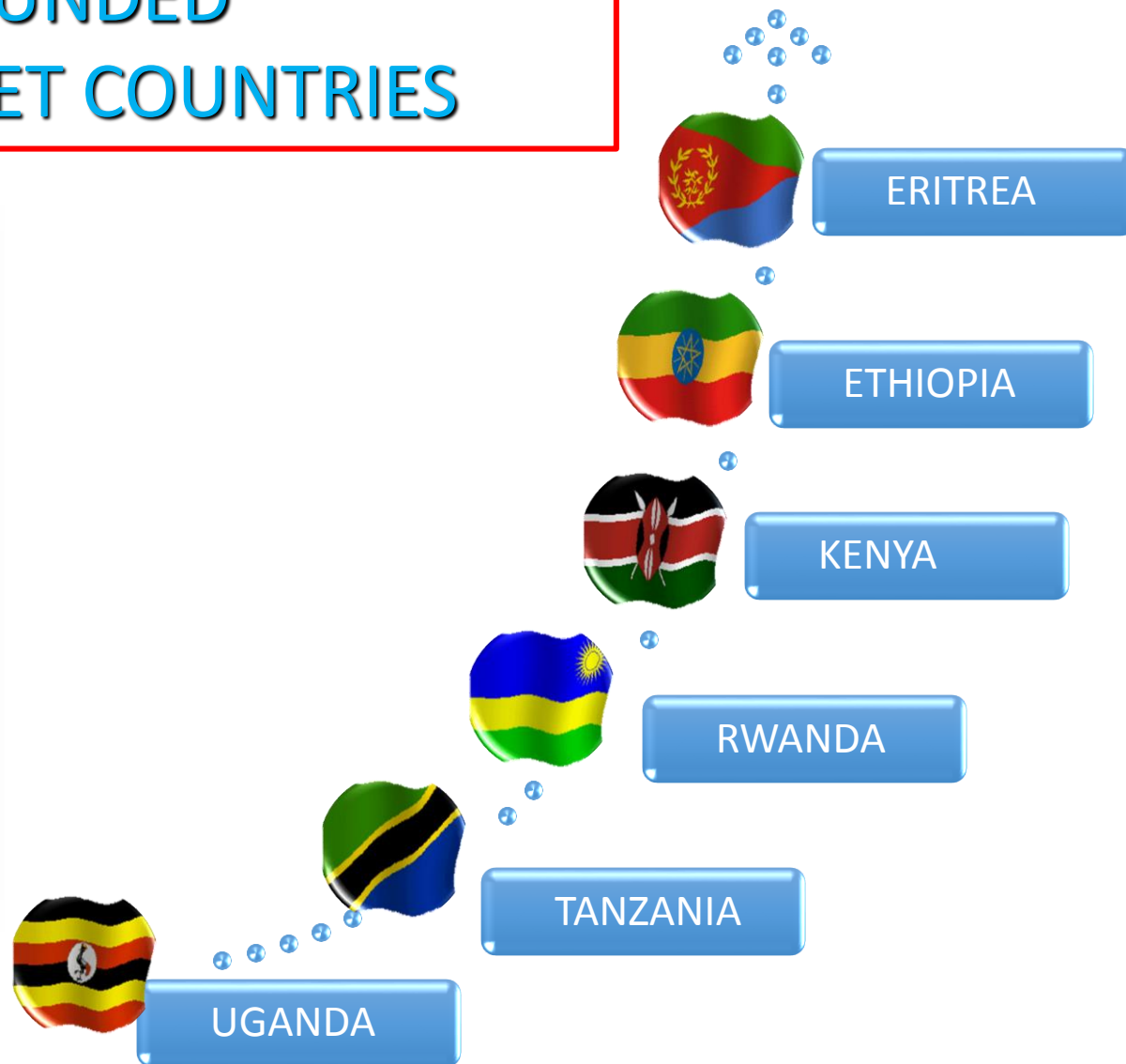
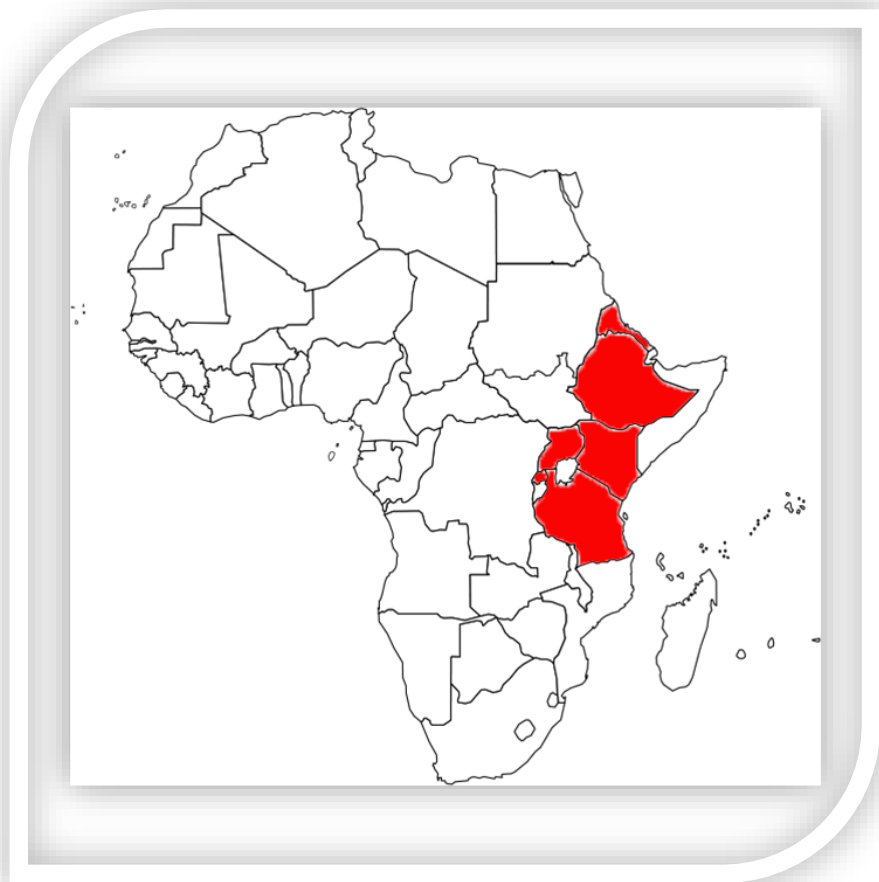
It brings solution through mitigation of risks associated with resource exploration and **catalyzes** investment.



www.theargeo.org



GEF-FUNDED ARGeo TARGET COUNTRIES



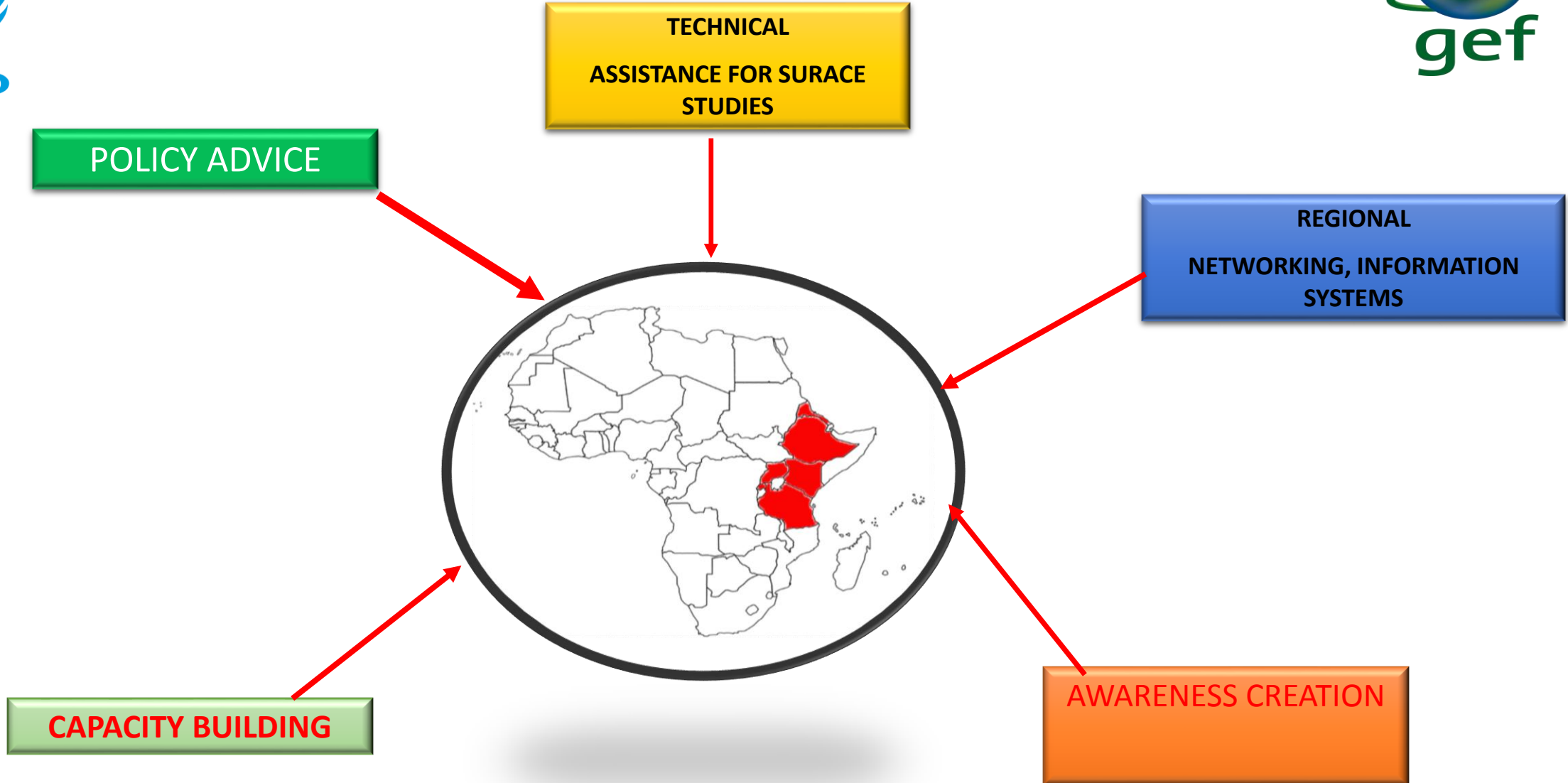
COUNTRIES -AGID



SUPPORTED ACTIVITIES



ARGeo: **Project** Components



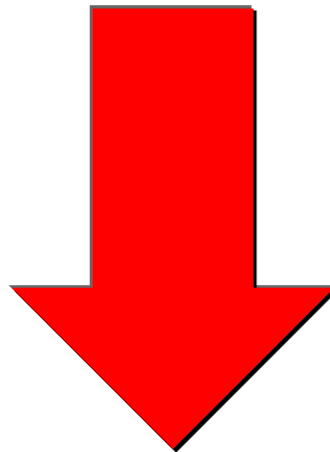
PARTNERS



- 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**



Created Country Ownership: VB



Countries own and lead the project - UNEP gives service as per needs and expectations of countries



KENYA



ETHIOPIA



UGANDA



RWANDA

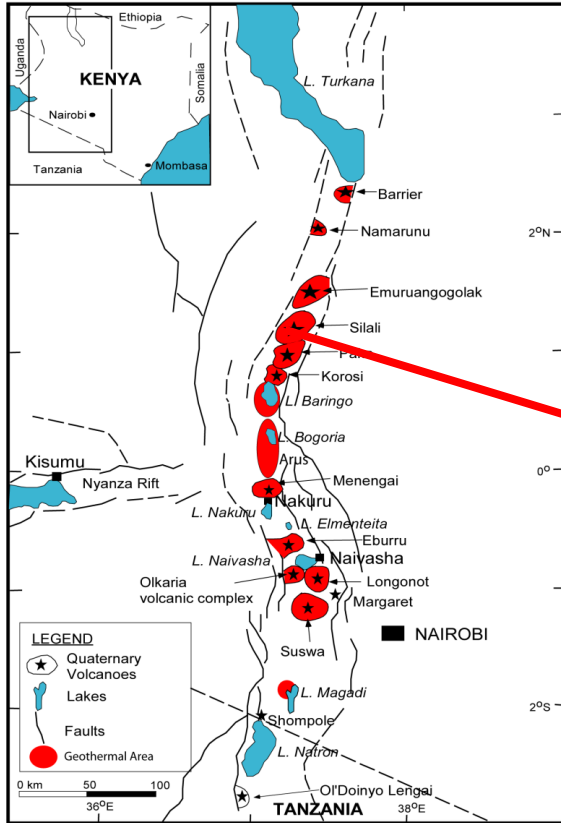


Tanzania

First two Completed projects



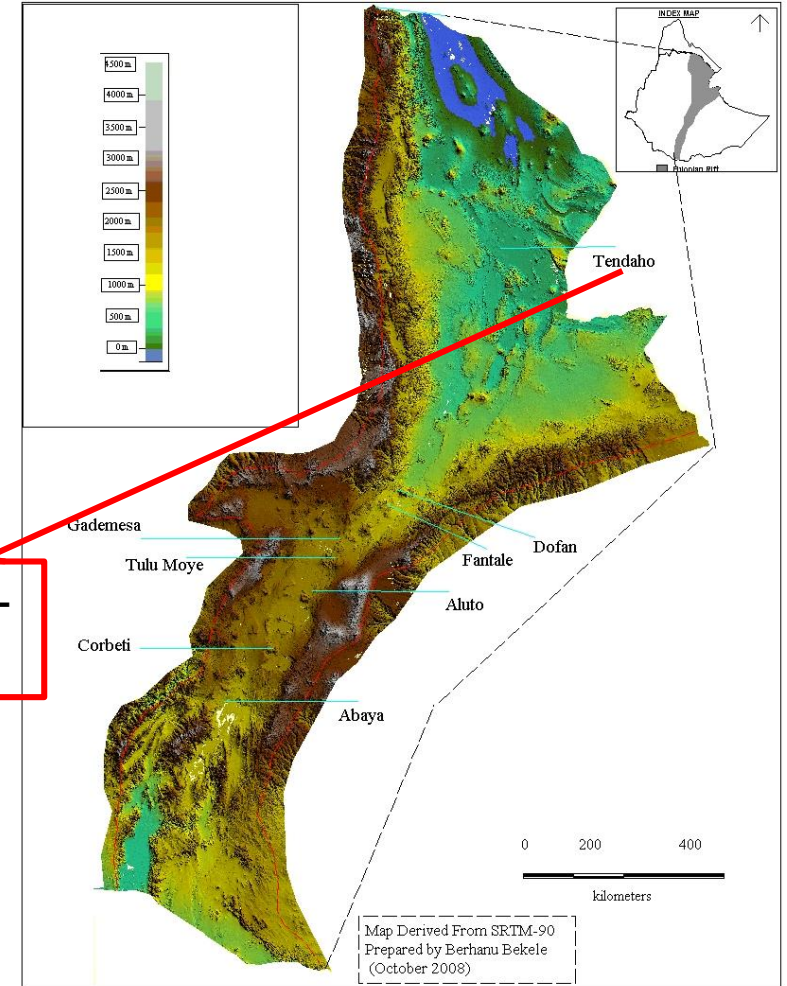
Completed two project pipelines (Kenya) and Tendaho (Ethiopia), which will be used for future investment and development and to be financed through AUC-KfW Geothermal Mitigation Facility, DFID and EU.



Silali

Tendaho (Dubti-Ayrobera)

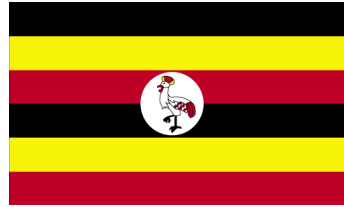
Investment and development banks (KfW and AfD) developed interest to invest in these two confirmed geothermal resource sites.



Other three Geothermal Projects



ERITREA



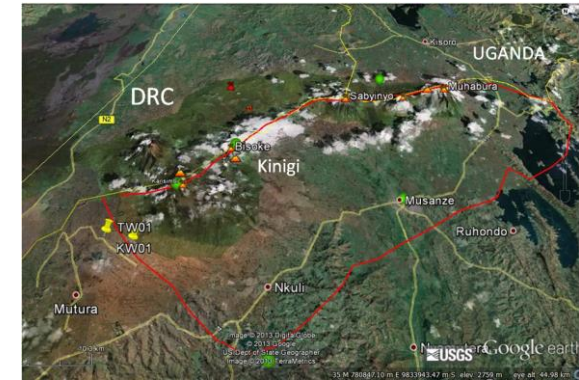
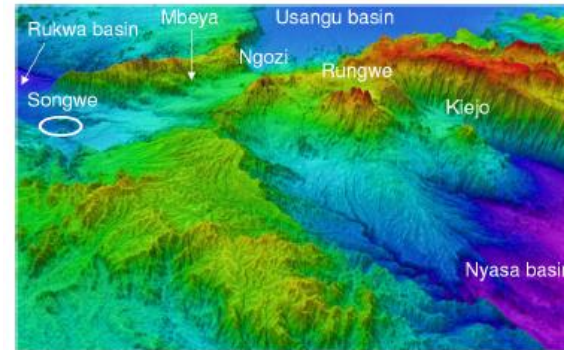
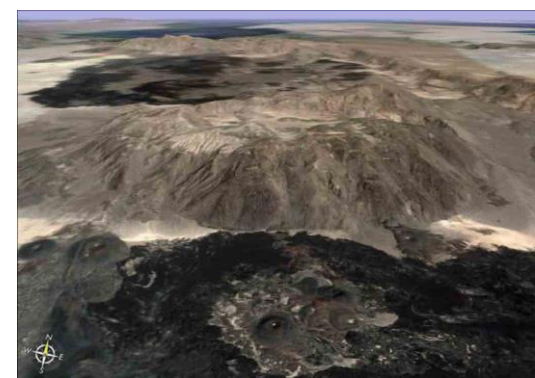
UGANDA



TANZANIA



Rwanda



CATALYSING INVESTMENT FOR GEOTHERMAL DEVELOPMENT



Developed ARGeo East African Information Database



ARGeo - African Geothermal Inventory Database (GID)
 UNEP - African Rift Geothermal Development Facility Project

gef UNEP

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 reserach or production data .The structure of the database is simple ,and it 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).
 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) emmissions 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 (KfW) project on Geothermal Risk Management Facility (GRMF) UNEP has also other partners such as Icelandic International Development Agency (ICEIDA), German Federal Institute for Geosciences and Natural Resources (BGR), United Nations University-Geothermal Training Programme (UNU-GTP) and Six ARGeo member countries.
 The GEF Funded ARGeo project has six member countries, namely: Eritrea, Ethiopia, Kenya, Tanzania, Rwanda and Uganda.
 The Project has two main components:
 • Regional Networking, Information Systems, Capacity Building and Awareness Creation, the database is developed under this component.
 • Technical Assistance in terms of surface exploration studies.








isora iceida



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

Spurred Geothermal interest through organization of Biennial Geothermal conferences



In Collaboration with
GoK (GDC, KENGEN ..)

- 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.

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 through 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

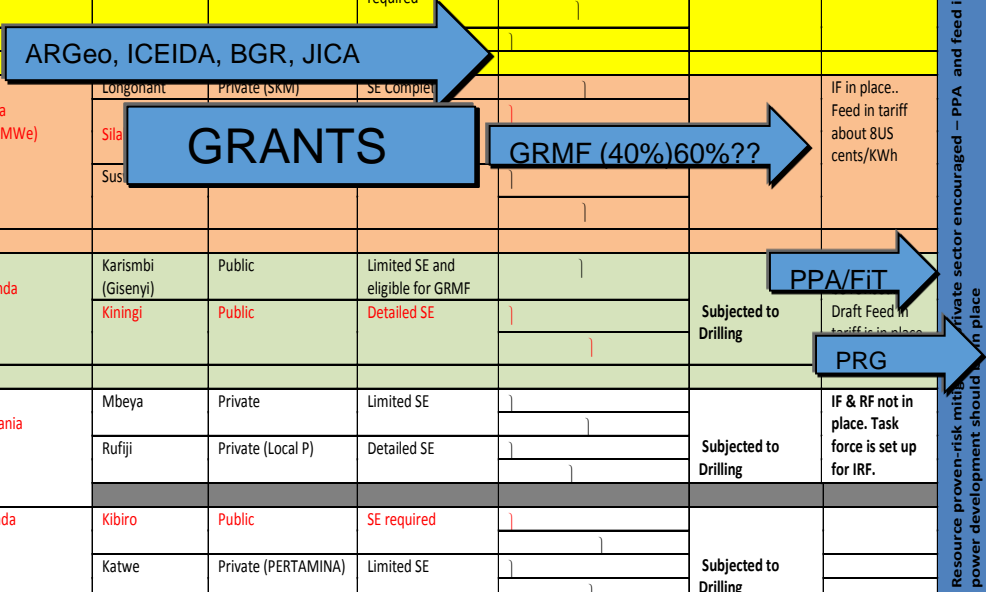


Representatives from 13 African Countries

**Determined and identified needs and expectations
of countries**

Scenarios for GED in the region (AMC)

Country	Geothermal Prospect	Developer	Status of prospects	Request for		Drilling Activity	TAF (Market, regulatory)- Feasibility	Potential electricity generation (MWe)
				SE	Drilling			
Ethiopia (7.2 MWe)	Corbett	Private (RG)	SE completed	-		Subjected to Drilling	Institutional and Regulatory Framework; Draft Feed in Tariff; PPA	450
	Tendaho	Public	Limited SE required (more geophysics)					
	Dofan-Fantale	Private (UK, COSZUS)	Detailed SE is required					
Kenya (250 MWe)	Longonant	Private (SKW)	SE Completed			Subjected to Drilling	IF in place.. Feed in tariff about 8US cents/KWh	800
	Sila							
	Susongor							
Rwanda	Karismbi (Gisenyi)	Public	Limited SE and eligible for GRMF			Subjected to Drilling	Draft Feed in tariff in place	100
	Kinigi	Public	Detailed SE					
Tanzania	Mbeya	Private	Limited SE			Subjected to Drilling	IF & RF not in place. Task force is set up for IRF.	
	Rufiji	Private (Local P)	Detailed SE					
Uganda	Kibiro	Public	SE required			Subjected to Drilling		100
	Katwe	Private (PERTAMINA)	Limited SE					
Eritrea	Alid	Public	Limited SE			Subjected to Drilling- WB		
	Nabbro Dubbi	Public	Detailed SE					
				ARGeo+ GRMF +ICEIDA+BGR		USAID+BGR, EU funded Proj.		WB, AfDB, E
				Public developers are encouraged to				, KfW etc.



YEAR 1: 2013 **Year 5: 2017**

➔

217 MWe Risk associated with EXPLoration is mitigated; PPP/IPP
 Meseret Teklemariam, UNEP **+500 MWe**

+500MWe

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

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