

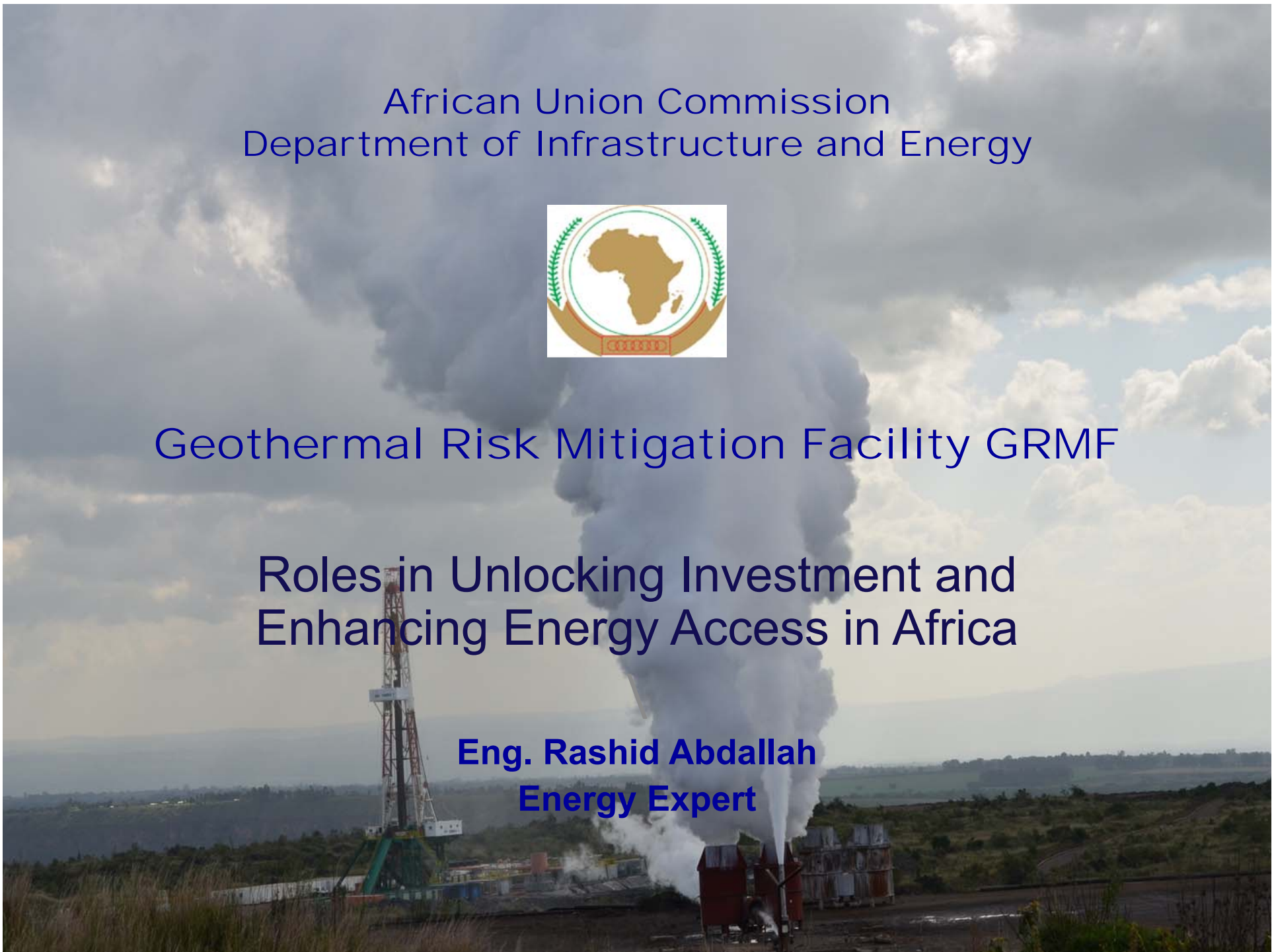
African Union Commission
Department of Infrastructure and Energy



Geothermal Risk Mitigation Facility GRMF

Roles in Unlocking Investment and
Enhancing Energy Access in Africa

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Energy Expert





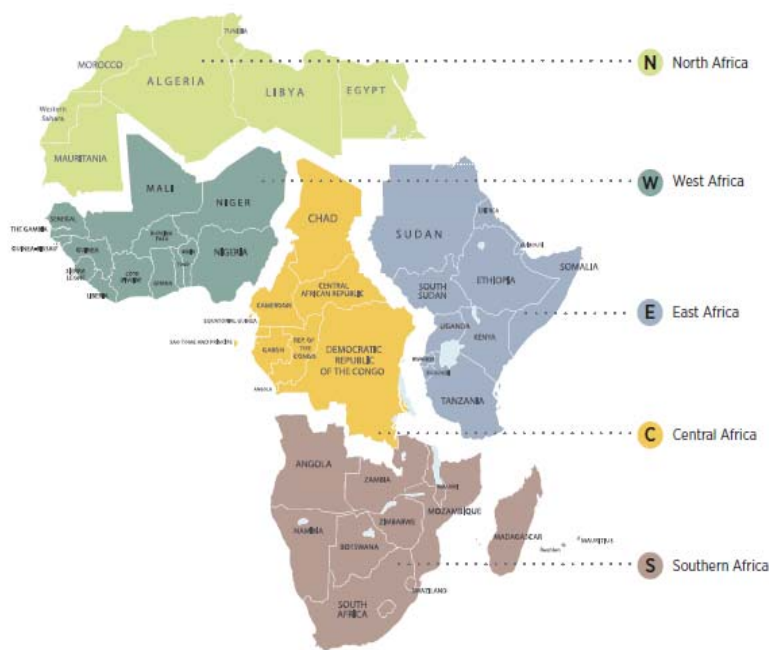
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Status of Energy in Africa

Figure 1 | Africa's energy landscape: Present*



Region	Population (million people)	GDP billion/yr (current international \$)	Access to electricity (% population)	Electricity (KWh per capita)
North Africa	175	1936	98%	1574
West Africa	327	1310	47%	188
East Africa	303	646	23%	91
Central Africa	115	227	25%	167
Southern Africa	177	1100	43%	2061

* Note: statistics refer to 2013, except for access to electricity which refers to 2012.

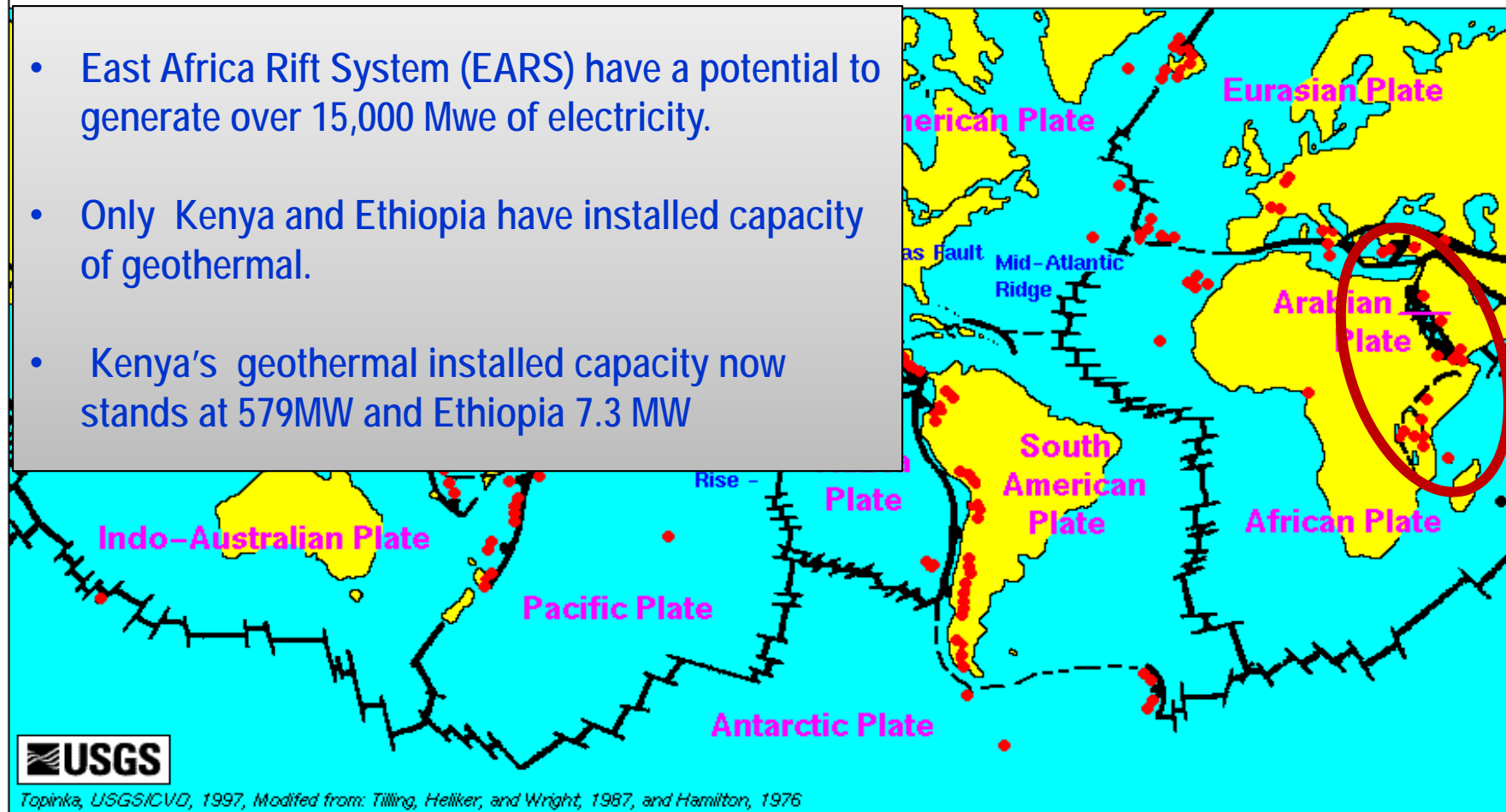
Source: IRENA - 2015



East Africa Rift System

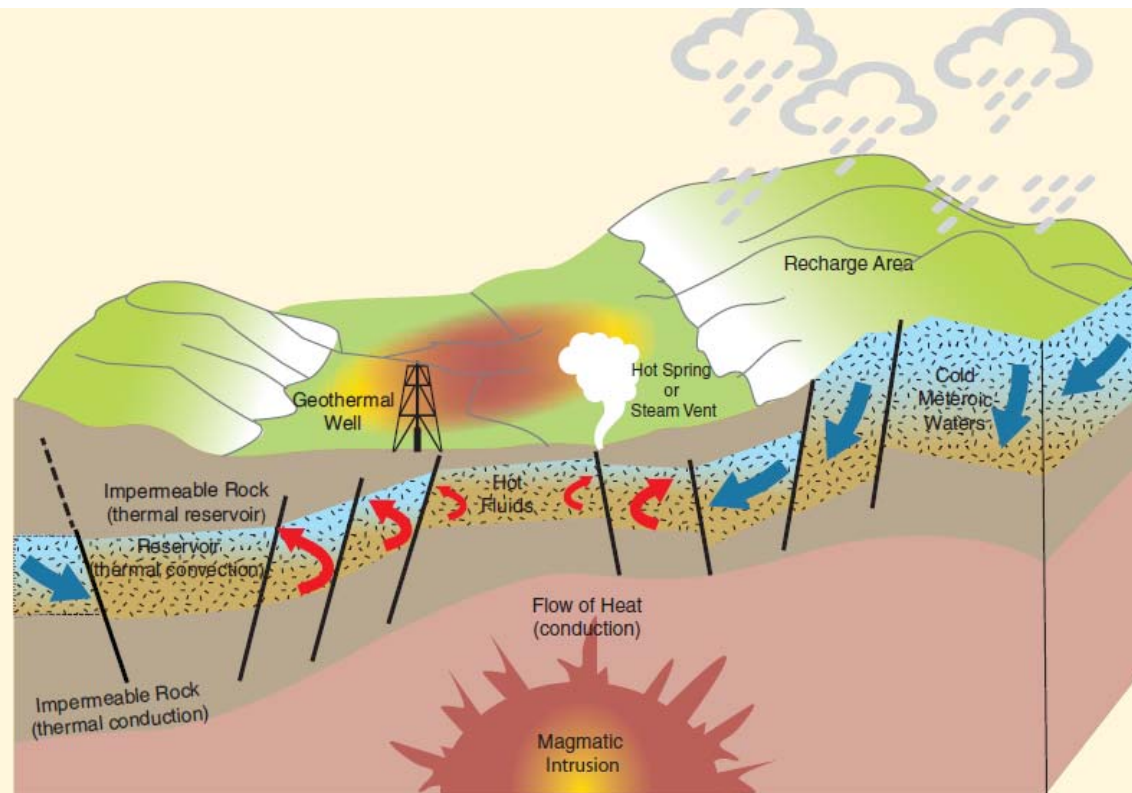
Active Volcanoes, Plate Tectonics, and the "Ring of Fire"

- East Africa Rift System (EARS) have a potential to generate over 15,000 Mwe of electricity.
- Only Kenya and Ethiopia have installed capacity of geothermal.
- Kenya's geothermal installed capacity now stands at 579MW and Ethiopia 7.3 MW





Geothermal Exploration and Risk Associated



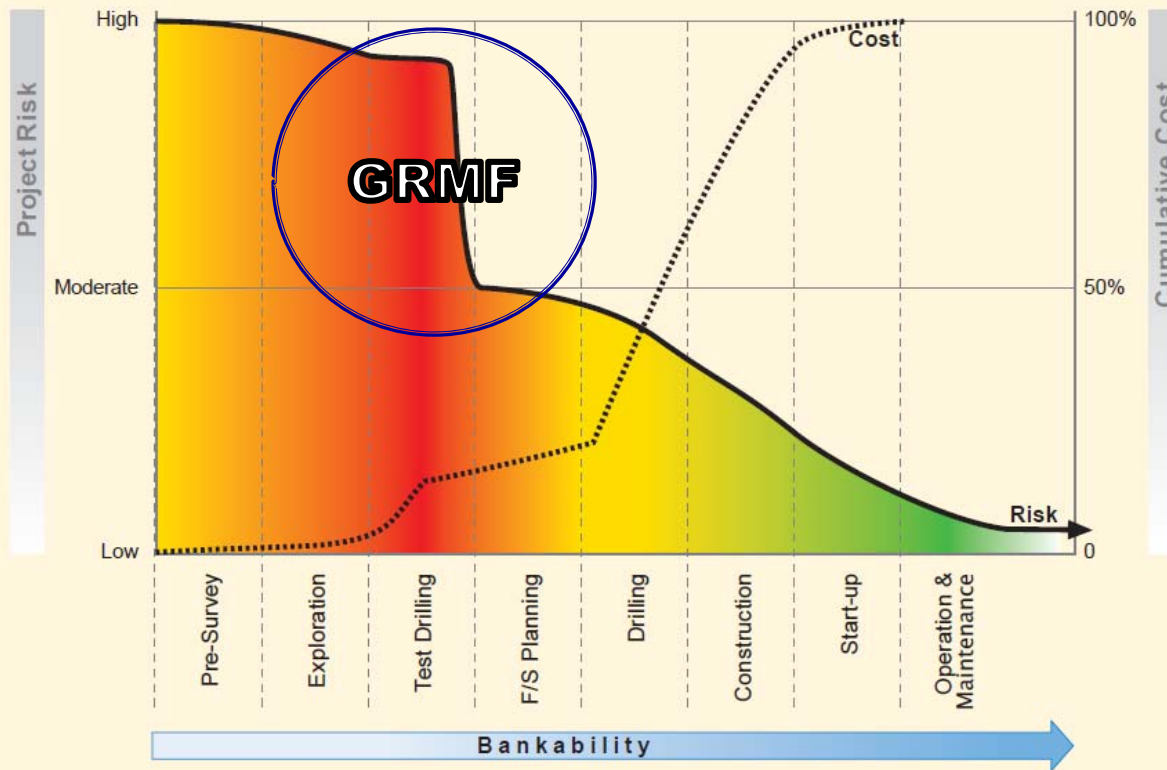
Not so Risky
Once resource known and steam confirmed, the risk is close to conventional thermal power plant

Very Risky
Unknown geology, cost of exploration and drilling make underground steam exploration very risky

Risk Exposure:

- High Risk: Dry holes, unusual drilling requirements, low resource temperature, low well flow, bad fluid characteristics, high drilling cost, capital intensive, etc

Geothermal Project Risk and Cumulative Invest Cost



Significant upfront costs at high risk – before the success of the project has been secured!



Public and private investors to invest in Geothermal Energy



Filling the gap:

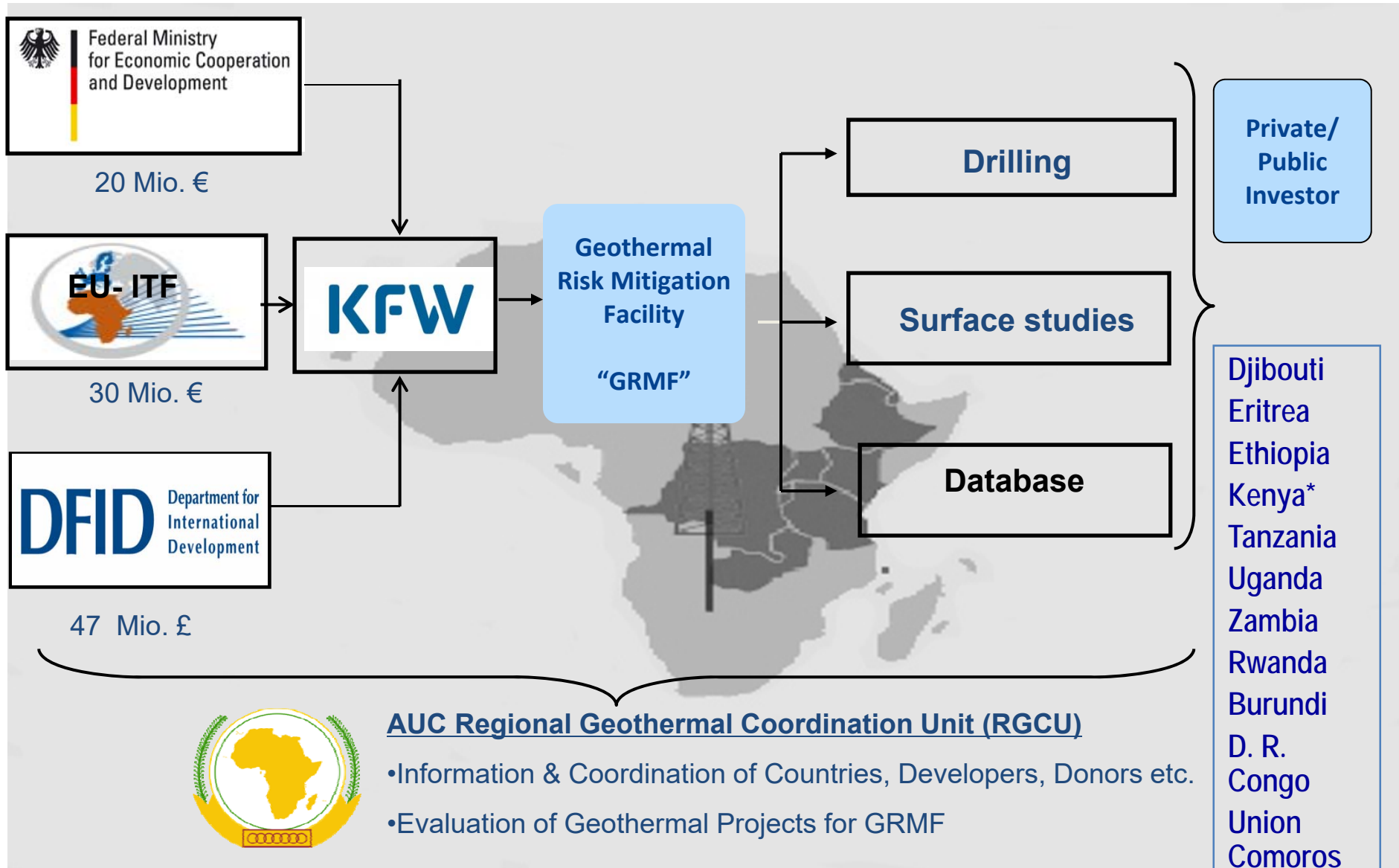
Public support mechanisms are crucial to remove entry hurdles into geothermal power development



Regional Geothermal Programme

- ❑ **Mandate given by Ministers for Energy from the 11 countries of the EARS on the Addis Ababa Declaration on Geothermal Energy (June 2009)**
- ❑ **Two workshops organized in response to given mandate:**
 - *Geothermal Stakeholders' Workshop (Nairobi, March 2010)*
 - *Regional Geothermal Training Workshop on Policy Development and Harmonization (Kigali, December 2010)*
- ❑ **The workshops urged AUC to take lead in:**
 - *Awareness creation (Decision makers)*
 - *Enabling environment for private sector*
 - *Coordinate the development partners*
 - *Capacity building*
 - **Mobilize funds for geoscientific investigations, drilling, feasibility studies**

GEOHERMAL RISK MITIGATION FACILITY - GRMF



GRMF FINANCIAL SUPPORT



- Infrastructure grants:** Up to 20% of the costs for infrastructure for surface studies drilling programmes (access roads, water, power)
- Surface studies grants:** Up to 80% of the costs (excluding infrastructure costs)
- Drilling grants:** Up to 40% of the costs for the exploration drilling and testing programme for reservoir confirmation wells (excluding infrastructure costs)
- Continuation Premium:** Up to 30% of the developer's share for the drilling and testing programme in case developers wish to continue with project (depending on the availability of funds).



GRMF Procedure (Qualification Phases)

Pre-qualification Phase:

1. Receive Expression of Interest (Eoi)
2. Preliminary examination (incomplete, invalid, non-responsive to Eoi)
3. Full Evaluation for following criteria:
 - Geo-scientific (50 points)
 - Financial, technical and permits (30 points)
 - Experience (20 points)
4. Invite Short List Pre-Qualified projects to submit full application

Full Application Phase:

1. Receive the full application
2. Preliminary examination (incomplete, invalid, non-responsive to application)
3. Full Evaluation for 12 criteria:
 - Indication drill sites, Robustness plans, authorization for exploration, Plan for financing , business plan, exploration experience, project references, management, organizational capabilities, etc.
4. Invite Qualified projects for Grant negotiation

Outcome of the 1st Application Round



- 2 projects from Ethiopia , 2 Projects from Kenya

Project	Applicant	Type of Project	Awarded Grant USA	Grant Status
Dofan (Ethiopia)	Geological Survey of Ethiopia (GSE)	Surface Study	976,872	Signed in March 2014
Corbetti (Ethiopia)	Reykjavik Geothermal	Drilling	5,594,821	Signed in May 2014
Bogoria-Silali (Kenya)	Geothermal Development Company (GDC)	Drilling	4,251,652	Signed in March 2014
Longonot (Kenya)	Africa Geothermal International Ltd. (Agil)	Drilling	6,098,941	Signed in November 2013
Total			16,922,286	



Outcome of the 2nd Application Round

- 1 project from Union Comoros, 2 projects from Ethiopia and 2 projects from Kenya

Project	Applicant	Type of Project	Awarded Grant USA	Grant Status
Karthala (Comoros)	Bureau géologique des Comores	Surface Study	844,680	Signed
Fantale (Ethiopia)	Cluff Geothermal – Private	Surface Study	876,770	December 2015
Tulu Moya (Ethiopia)	Reykjavik Geothermal – Private	Surface Study	1,200,000	December 2015
Akiira One (Kenya)	Akiira One Ltd – Private	Drilling	2,517,295	Not Signed
Suswa (Kenya)	Geothermal Development Company (GDC)	Drilling	6,579,017	Not Signed
Total			10,800,467	

Outcome of the 3rd Application Round

Subject to Oversight Committee's approval



The projects qualified and awarded grants:

- 2 projects from Ethiopia
- 2 projects from Kenya
- 1 project from Djibouti
- 1 project from Rwanda
- 1 project from Comoros
- Projects from Tanzania and Uganda still under evaluation

The total awarded grant in 3rd application round estimated to USD 27 Million

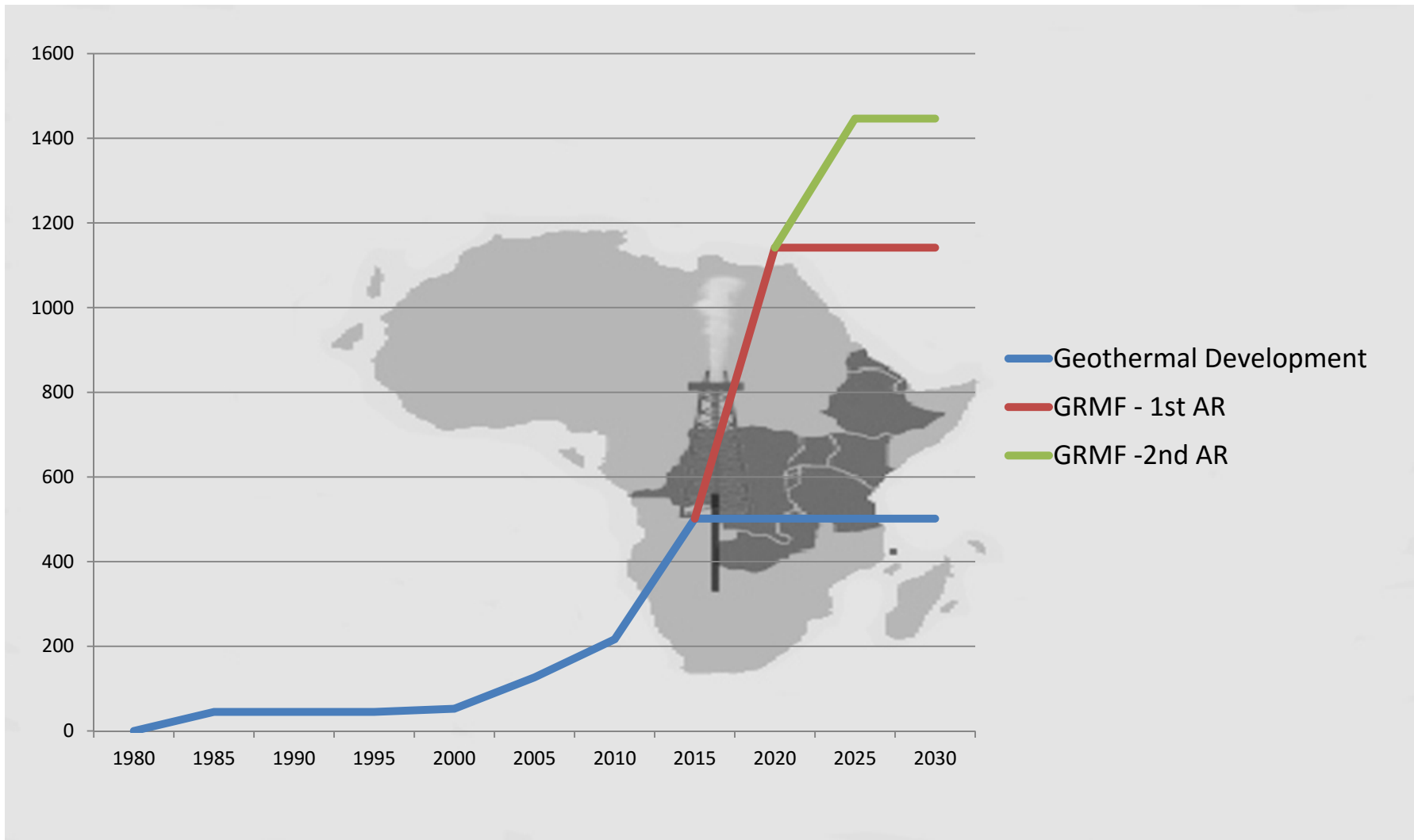
The 4th application planned to launch in Mid – March 2016

The Role of GRMF in Enhancing Energy Access in East Africa



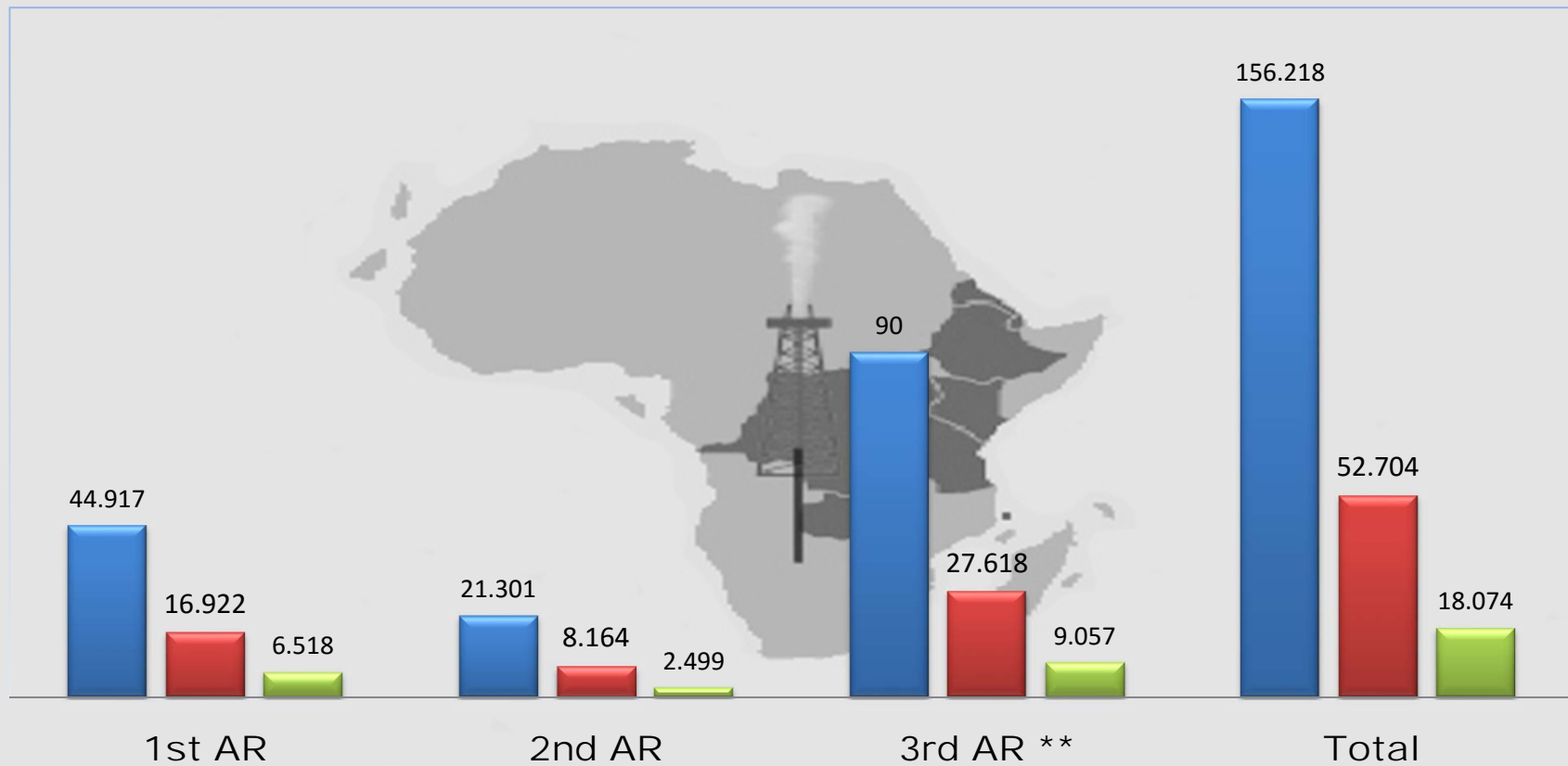
	Power Plant	Capacity MW	Date
Kenya	Several plants	579	1980 – 2014**
Ethiopia	Aluto Langano	7.5	1998
GRMF – 1 st AR	Corbetti - Ethiopia	300	2020
	Bogoria-Silali - Kenya	200	
	Longonot - Kenya	140	
GRMF – 2 nd AR	Akiira - Kenya	40 -140	2022
	Suswa -	150	
GRMF – 3 rd AR	Karthala	10	2024
	Korosi	350	
	Paka	350	
	Fantale	30	
	Kinigi	20	
Total		2176.5	

The Role of GRMF in Enhancing Energy Access in East Africa



THE Role of GRMF in Unlocking Investment in East Africa

■ Projects Cost Mio USD ■ Grants Awarded Mio USD ■ Continuation Premium Mio USD





GRMF Regional Benefits

- Attracting the “best” geothermal prospects and developers**
- Supporting the regional objectives to diversify energy mix**
- Collection of regional information to reduce exploration risks in the future**
- Using drilling rigs in an efficient manner**
- Development of capabilities across the region**





Regional Geothermal Programme – other elements

- ❑ **Awareness creation (Decision makers)**
 - Sensitization visits
- ❑ **Enabling environment for private sector**
 - Established East Africa Geothermal Energy facility (EAGER) funded by DFID
- ❑ **Coordinate the development partners, signed MoU with**
 - United Nations Environment Programme (UNEP)
 - Federal Institute for Geosciences and Natural Resources (BGR)
 - Icelandic International Development Agency (ICEIDA)
 - United States Agency for International Development (USAID)
- ❑ **Capacity building**
 - Finalized feasibility study of (African Geothermal Center of Excellency)





CONCLUSION

- **Focus on the region with high geothermal resources**
- **Encourage competition between applicants**
- **Rapid and Transparent evaluation procedure**

Therefore GRMF show success in

- **Attracting required investment from public & private**
 - **Boosting effort of Enhancing Energy Access**
 - **Speeding up the time frame of implementing geothermal projects**
- GRMF Model can be duplicated in other technology (Solar, Biomass)**



Thank you for your Attention

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