



Geothermal Risk Mitigation Facility (GRMF) Implementation Report of Geothermal Risk Mitigation Facility

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1^{ère} Session ordinaire du CTS sur les transports, les infrastructures transcontinentales et interrégionales, l'énergie et le tourisme





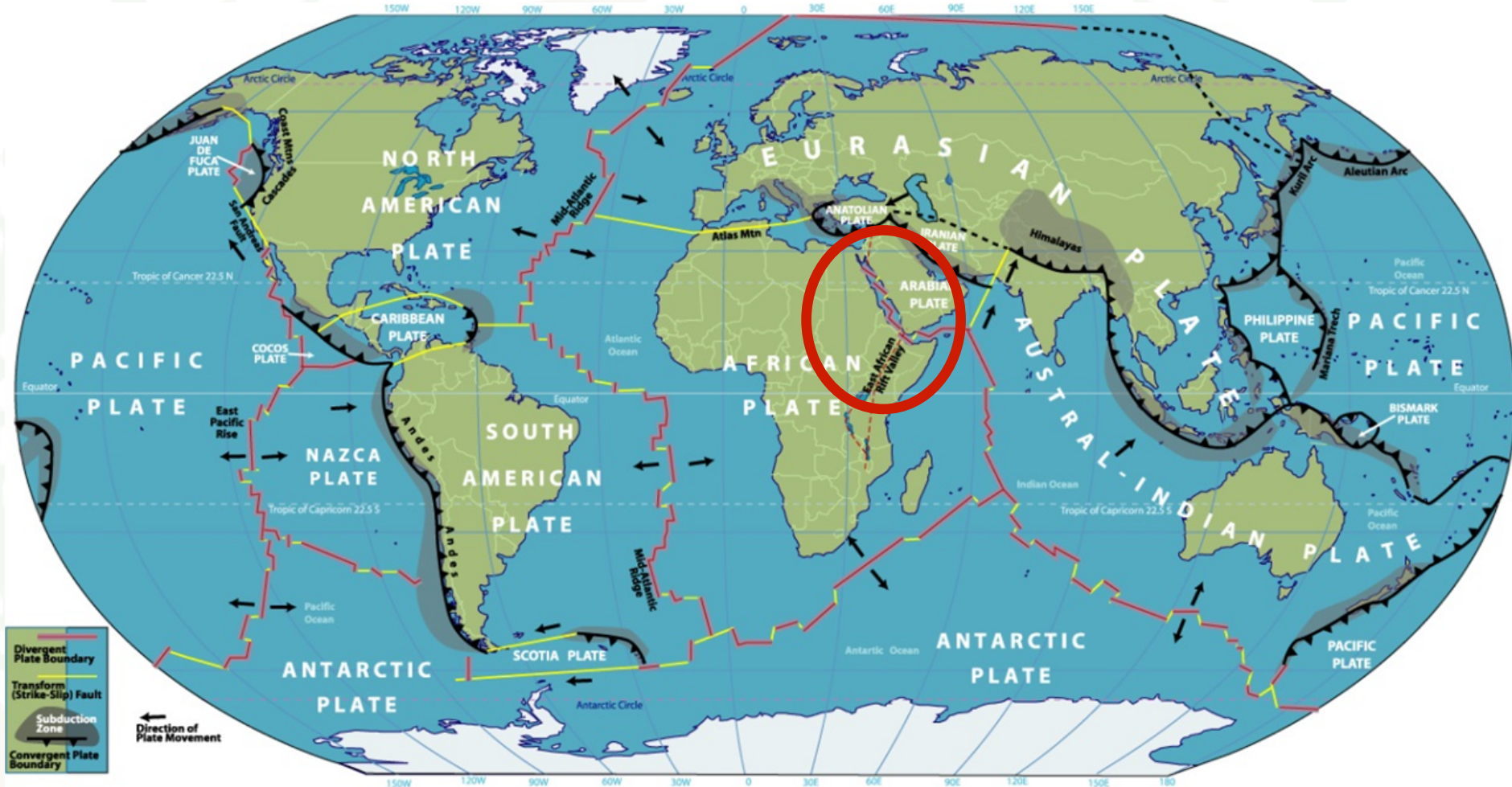
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- ❑ Geothermal Risk Mitigation Facility (GRMF)
- ❑ Outcome of 1st, 2nd and 3rd application round
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GEO THERMAL ENERGY

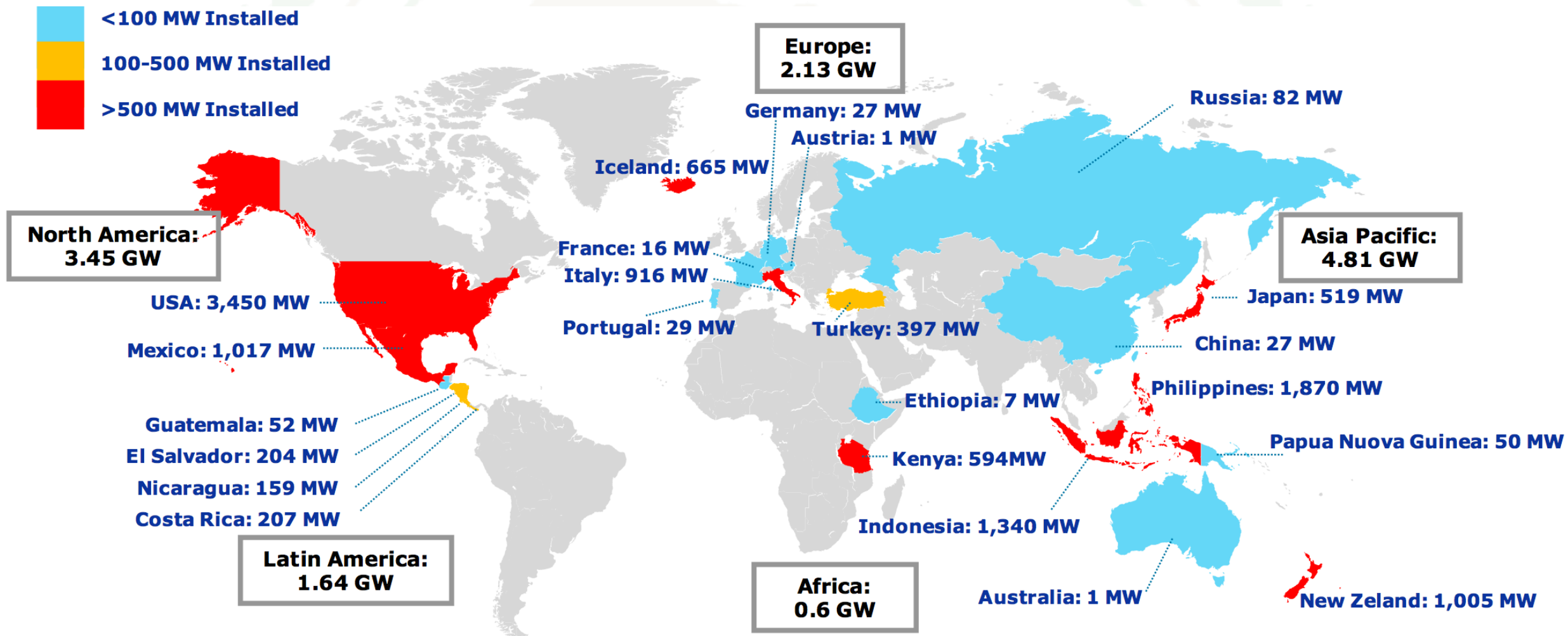


The best geothermal fields are found around volcanically active areas often located close to boundaries of tectonic plates.





GLOBAL GEOTHERMAL INSTALLED CAPACITY -2016





GEOHERMAL ENERGY

- ❑ EARS running from dead sea to central Mozambique in East Africa
- ❑ The geothermal resources of EARS have a potential to generate 15,000 – 20,000 MW.
- ❑ Currently used to a limited extent in the EARS countries (650 MW mainly in Kenya)
- ❑ Geothermal energy is a clean, renewable, environment-friendly and indigenous resource





REGIONAL GEOTHERMAL PROGRAMME

- A mandate given the AUC by the Ministers of Energy from the 11 countries of the EARS to establish Regional Geothermal Programme - Addis Ababa Declaration on Geothermal Energy (June 2009);
 - *Geothermal Stakeholders' Workshop (Nairobi, March 2010)*
 - *Regional Geothermal Training Workshop on Policy Development and Harmonization (Kigali, December 2010)*
 - *Regional Working Group meeting (Kampala, 2011)*
 - *Regional Working Group meeting (Addis Ababa on 2012)*





REGIONAL GEOTHERMAL PROGRAMME

□ Regional Geothermal Workshops Recommendation to AUC:

- Create awareness to promote adequate commitment;
- Take roles in minimizing the up front cost risk ;
- Take initiative to improve technical information required ;
- Participate in capacity building targeting both public and private sector (Regional Training Institution & Centers of Excellency);
- Coordinate the supporting programmes;
- Assist government by proposing guideline , technical assistance, facilitate collaboration and experience exchange





Geothermal Risk Mitigation Facility (GRMF)

www.grmf-eastafrika.org





REGIONAL GEOTHERMAL PROGRAMME

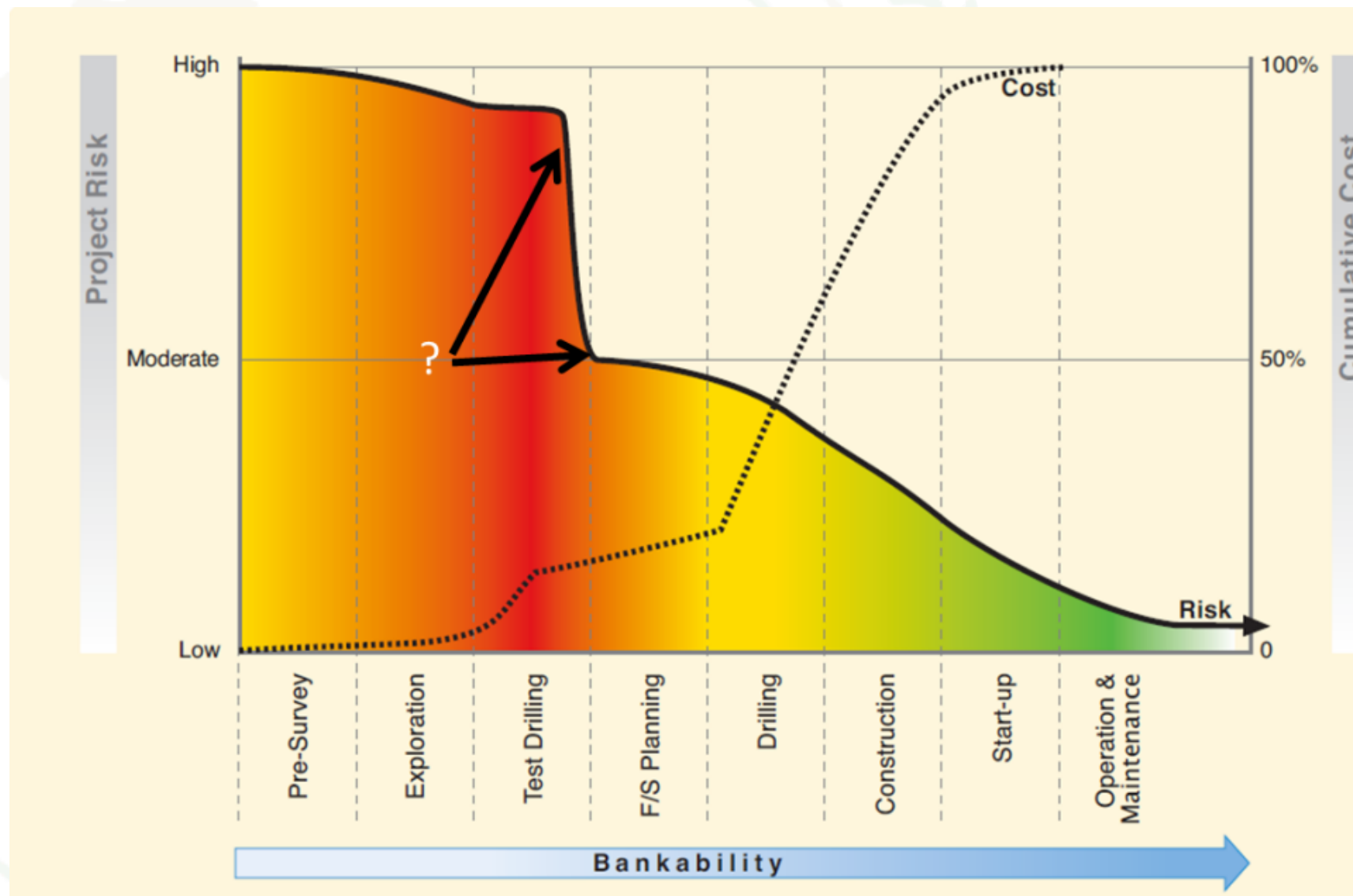
Significant upfront costs at high risk – before the success of the project has been secured !



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





Financial Support and Eligibility

ELIGIBLE ENTITIES:

- Public Companies
- Private Companies
- Public Private Partnerships (PPP)

Donors:

- **BMZ : Euro 20 M ;**
- **EU : Euro 30 M;**
- **DFID : £ 47 M.**
- **All fund channel through KfW**

ELIGIBLE COUNTRIES:

- Ethiopia, Kenya
- Rwanda, Tanzania,
- Uganda, Burundi,
- Comoros, Djibouti,
- DRC, Eritrea
- Zambia.

GRMF FINANCIAL SUPPORT

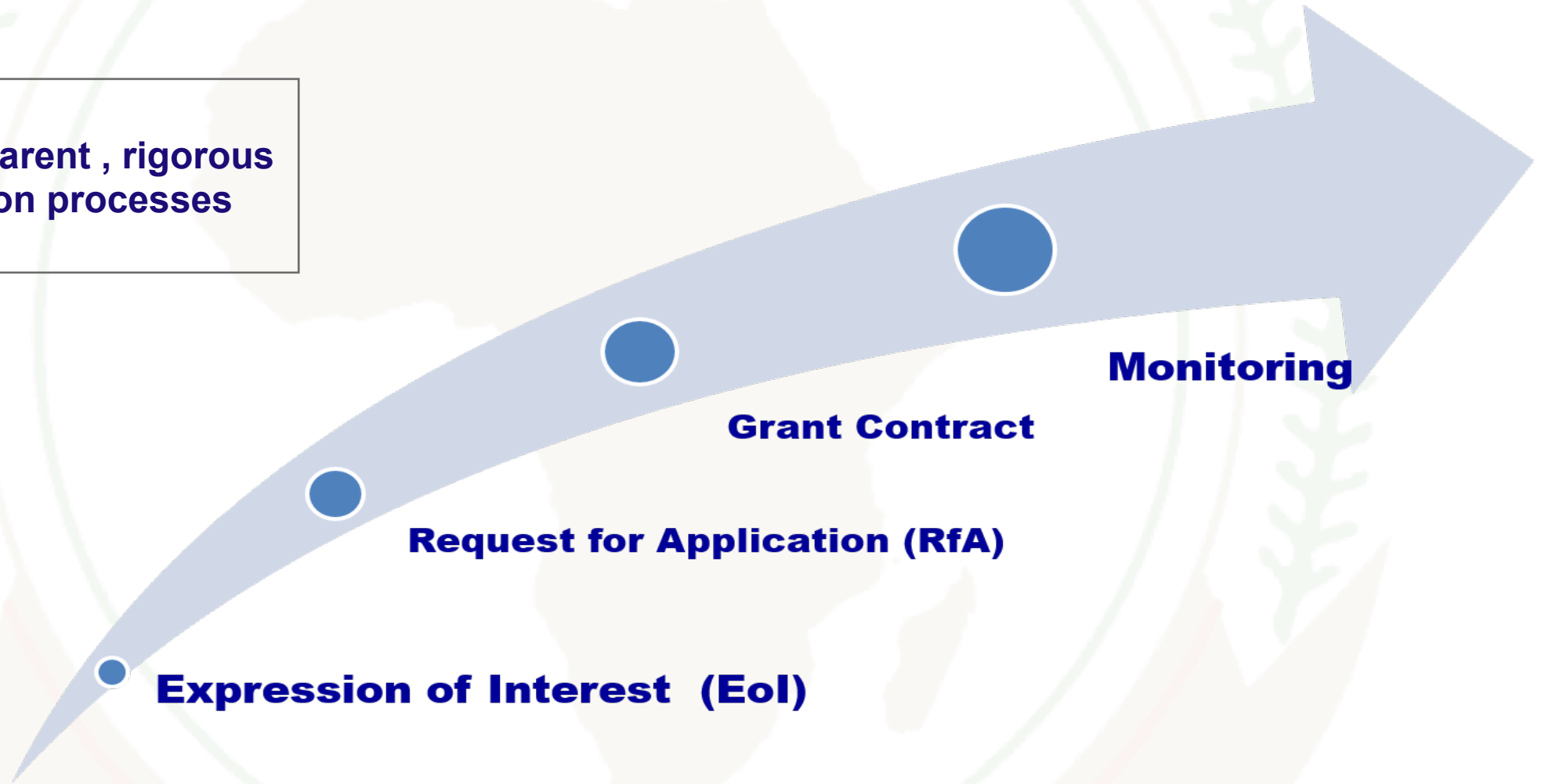
- Infrastructure grants:** Up to 20% of the costs for infrastructure for surface studies drilling programmes (access roads, water, power)
- Surface studies grants:** Up to 80% of the costs (excluding infrastructure costs)
- Drilling grants:** Up to 40% of the costs for the exploration drilling and testing 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).





Qualification and Implementation Phases for GRMF Grant

competitive, transparent , rigorous
two-stage evaluation processes





Outcome of 1st Application Round

(Ethiopia, Kenya, Rwanda, Tanzania, Uganda)

List of projects awarded GRMF Grant

Project	Applicant	Type of Project	Awarded Grant USA	Grant Signing
Dofan (Ethiopia)	Geological Survey of Ethiopia (GSE)	Surface Study	976,872	3 rd March 2014
Corbetti (Ethiopia)	Reykjavik Geothermal	Drilling	5,594,821	26 May 2014
Bogoria-Silali (Kenya)	Geothermal Development Company (GDC)	Drilling	4,251,652	3rd March 2014
Longonot (Kenya)	Africa Geothermal International Ltd. (Agil)	Drilling	6,098,941	27 November 2013





Outcome of 2nd Application Round

(Burundi, Comoros Islands, Djibouti, D. R. Congo, Ethiopia, Eritrea, Kenya, Rwanda, Tanzania, Uganda, Zambia)

List of projects awarded GRMF Grant

Project	Applicant	Type of Project	Awarded Grant USA	Grant Status
Karthala (Comoros)	Bureau géologique des Comores	Surface Study	844,680	14 May 2015
Fantale (Ethiopia)	Cluff Geothermal – Private	Surface Study	862,131	21 January 2016
Tulu Moye (Ethiopia)	Reykjavik Geothermal – Private	Surface Study	1,314,000	30 November 2015
Akiira One (Kenya)	Akiira One Ltd – Private	Drilling	1,373,877	2 March 2016
Suswa (Kenya)	Geothermal Development Company (GDC)	Drilling	6,579,017	Pending





Outcome of 2nd Application Round

(Burundi, Comoros Islands, Djibouti, D. R. Congo, Ethiopia, Eritrea, Kenya, Rwanda, Tanzania, Uganda, Zambia)

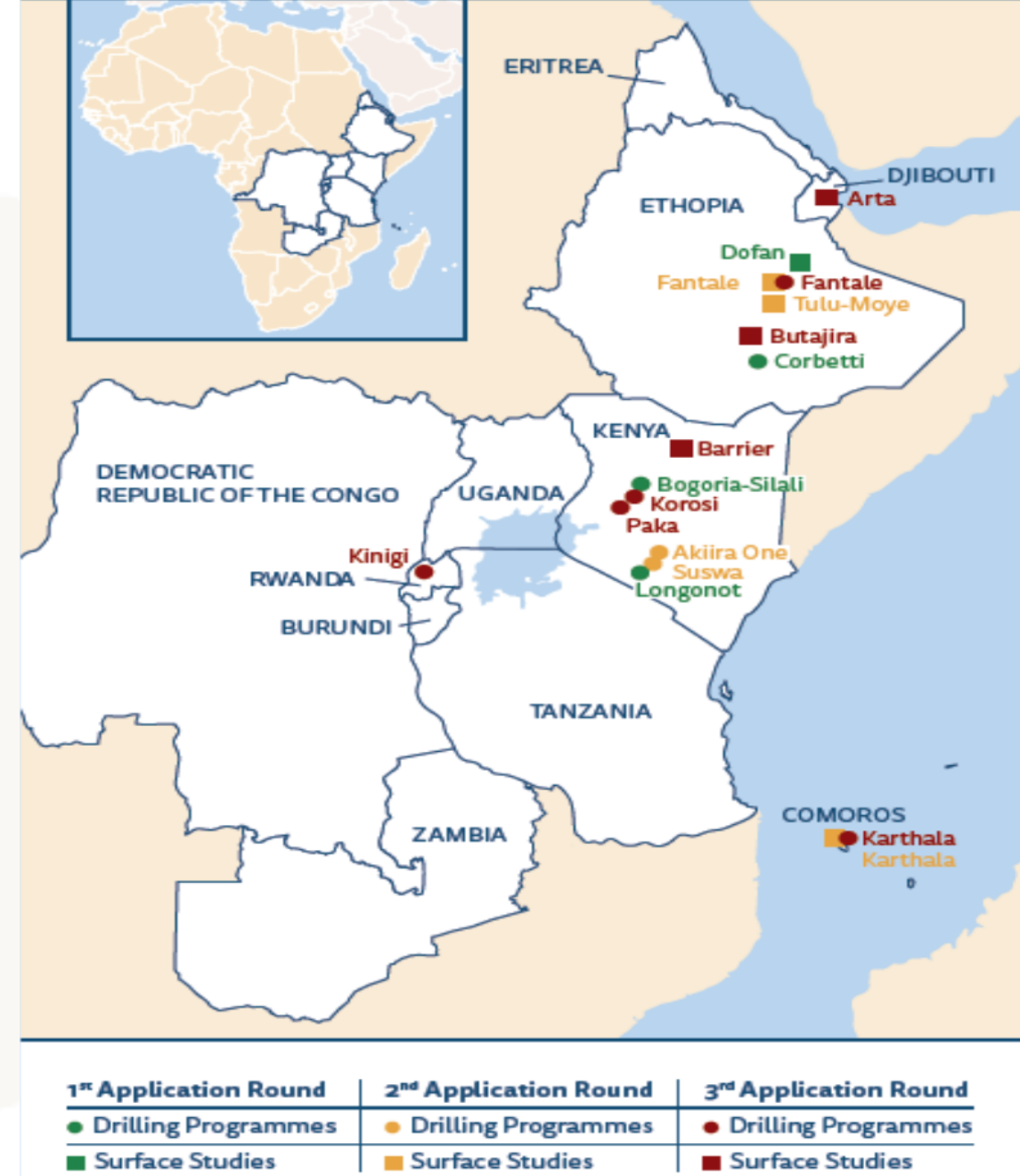
Project	Applicant	Type of Project	Awarded Grant USA	Grant Signing
Barrier (Kenya)	Olsuswa energy ltd Private	Surface Study	980,568	1st half 2017
Butajira (Ethiopia)	Cluff Geothermal – Private	Surface Study	609,200	
Arta (Djibouti)	Djibouti Office for Development of Geothermal Energy	Surface Study	928,007	
Karthala (Comoros)	Bureau géologique des Comores	Drilling	8,328,856	
Fantale (Ethiopia)	Cluff Geothermal – Private	Drilling	3,811,102	
Korosi (Kenya)	GDC	Drilling	4,565,259	
Paka (Kenya)	GDC	Drilling	5,162,910	
Kinigi (Rwanda)	Energy Development Corporation Ltd	Drilling	4,439,444	





Projects awarded grants in 1st, 2nd and 3rd Application Rounds:

- ❑ 17 Projects awarded Grants.
- ❑ 7 grants awarded to Surface Studies
- ❑ 10 grants awarded to Drilling Programmes
- ❑ Most projects from Kenya and Ethiopia
- ❑ One project from each Djibouti, Rwanda and Comoros
- ❑ The total grants awarded is USD 58.5 Million





Status of 4th Application Round

Country	Applicant	Project
Ethiopia	Reykjavik Geothermal ehf (RG)	Abaya SS
	Ethiopia Electric Power (EEP)	Alalobeda DP
	OrPower 12 Inc	Wando Ganet DP
	OrPower 12 Inc	Boku DP
	OrPower 12 Inc	Daguna Fango DP
	Reykjavik Geothermal ehf (RG)	Tulu-Moye DP

Country	Applicant	Project
Kenya	Maralal Energy Ltd.	Chepchuk SS
	Arus Energy Ltd.	Arus SS
	Capital Power Ltd	Homa Hills SS
	Olsuswa Energy Ltd.	Barrier DP
Tanzania	Tanzania Geothermal Development Company Ltd	Kisaki SS
	Tanzania Geothermal Development Company Ltd	Ngozi DP
Uganda	Geothermal Resources Departmen	Kibiro SS
	COZUMEL Energy Ltd	Katwe SS





Status of 4th Application Round

- Application of 14 projects were received in the 4th application round;
- Potential grants estimated to be USD 50 M if all project qualified





CHALLENGES

- ❑ Secure Developers' Own Share;
- ❑ Institution and Legal framework;
- ❑ Delay in Implementing GRMF funded Projects;
- ❑ Limited Availability of Experts;
- ❑ Limited/ no participation from some beneficiaries countries.





Regional Geothermal Programme Activities

□ Some of the achievements:

- Feasibility study for African Geothermal Centre of Excellence
- African Union Code of Practice for Geothermal Drilling
- East Africa Geothermal Energy Facility (EAGER)
- BGR Regional Geothermal Programme for East Africa
- Support member state to prepare application to GRMF (ICEIDA)





Regional Geothermal Programme Activities

“ Feasibility Study of an Africa Geothermal Center of Excellence”

- ❑ Currently the geothermal installed capacity is 600 MW and expected to increase to 1550 MW by 2025
- ❑ substantial African geothermal expertise are needed
- ❑ Additionally, state-of-art lab facilities, equipment and hardware/software are also needed
- ❑ Feasibility study has done with UNEP, ICEIDA, NDF, GDC and Kengen from Kenya;
- ❑ Agreement to establish the AGCE in Kenya (AUC, UNEP, kengen, GDC)
- ❑ Action plan has developed

Feasibility Study for the establishment of an Africa Geothermal Center of Excellence

FINAL REPORT
December, 2015



Presented by:
Partnership International
Sustainable Development

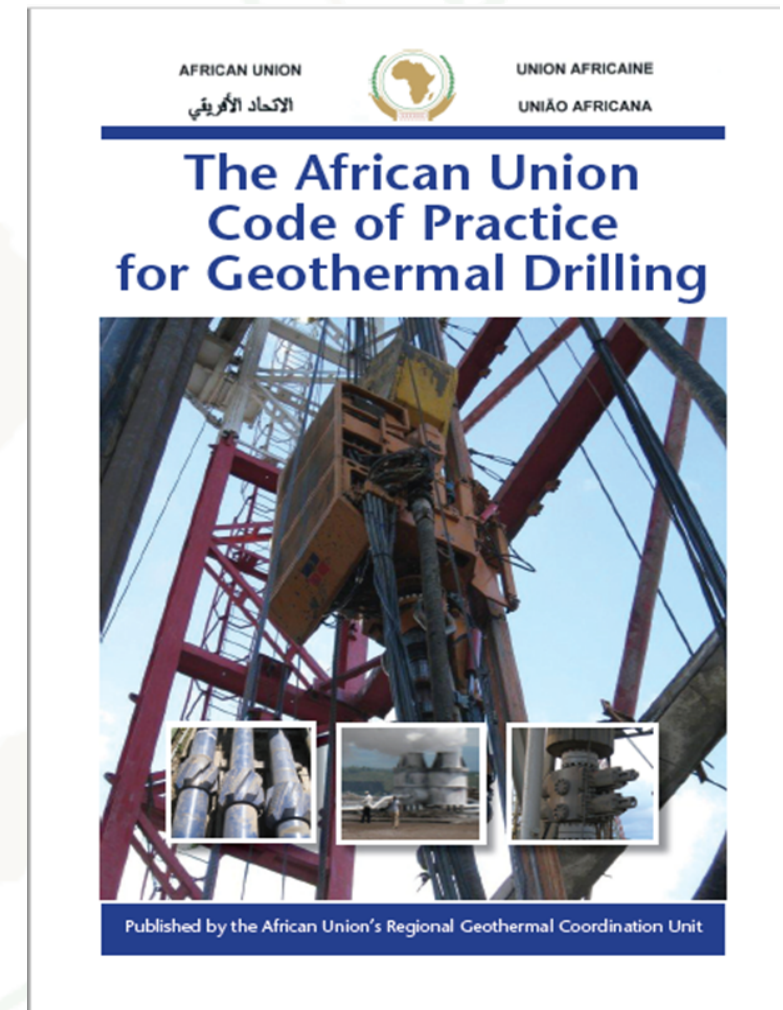




Regional Geothermal Programme Activities

“ The African Union Code Of Practice for Geothermal Drilling”

- ❑ Geothermal development in Eastern Africa taking place in absence of any drilling regulation.
- ❑ In collaboration with German Federal Institute for Geosciences and Natural Resources (BGR) & Ministry of foreign Affairs of New Zealand, AUC developed “ The African Union Code Of Practice for Geothermal Drilling”
- ❑ The “ Code” for minimizing impact on environment, social, health and safety in exploration, well field development drilling, power plant construction and operation,
- ❑ The code Provides an operating framework for Regulators, Project Owners and operators





Regional Geothermal Programme Activities

“East Africa Geothermal Energy Facility - EAGER”

- ❑ Funded by DFID with GBP 6 million
- ❑ Regional Technical Assistance programme running for 3.5 years from May 2015
- ❑ Covering 5 countries (Ethiopia, Kenya, Rwanda, Tanzania, Uganda)
- ❑ Seeks to cover gaps in Government role to support geothermal development by removing barriers and speeding progress





Regional Geothermal Programme Activities

“BGR’s Regional Geothermal Programme ”

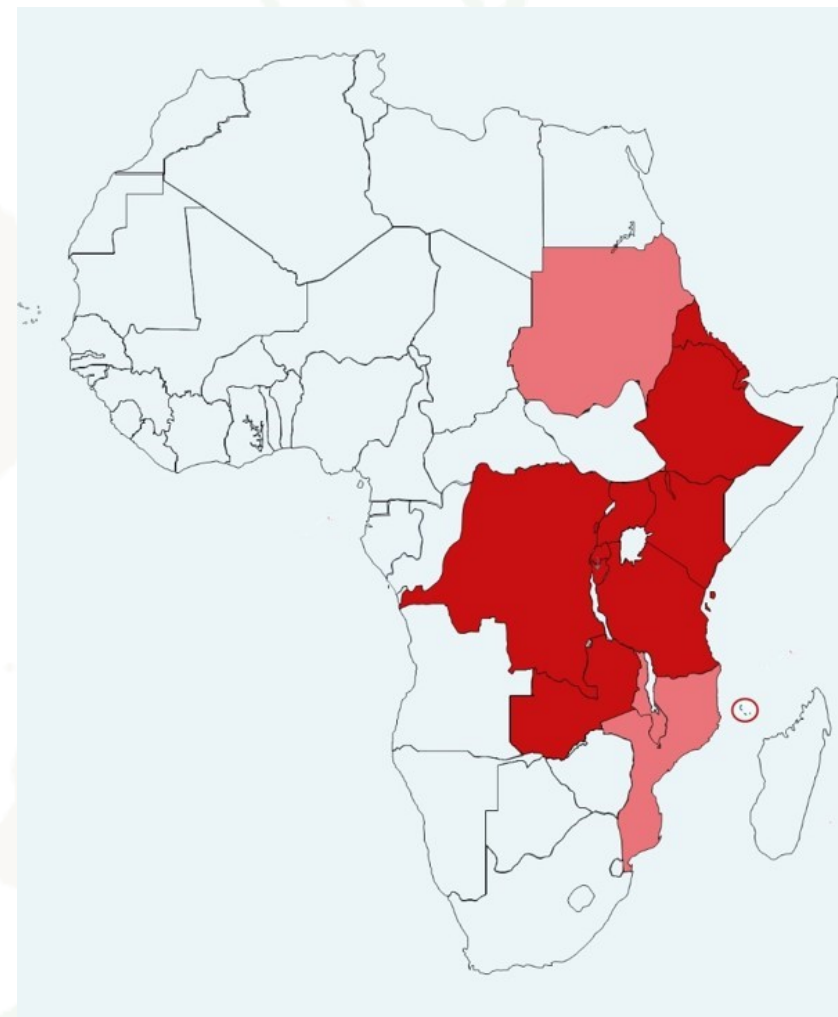
☐ Funded by BMZ with + 3 Mio. € for 3 years starting from July 2016

☐ Planned support are:

- Support in pre-exploration measures and siting
- Support with the completion of already approved projects in relation to the GRMF and other geothermal risk reduction facilities
- Support in regulatory questions and strategies
- Other support and consultation services and information exchange, purchase of equipment
- Capacity Building

☐ Work one so far:

- MoU with Uganda
- MoU with Djibouti
- Workshop for GDC & kengen on drilling code
- Planning visits to Eretria and Sudan





The Government Risk Mitigation Facility (GRMF)
 A Catalyst for Eastern Africa Government Development

Abstract
 Government Risk Mitigation Facility (GRMF) for Eastern Africa was launched in October 2012 to address government risks of funding critical infrastructure projects.





Recommendation and the Way Forward

- ❑ Funds mobilization for subsequent application rounds
- ❑ Technical support mobilization specially for public institutions
- ❑ Improve regulatory framework and enable environment for private sector
- ❑ Review and improve the modality of GRMF (Discussion Started with KfW)
- ❑ Improve the procedure of grant management within the AUC.
- ❑ Create Regional capacity Building programme “ Africa Geothermal Centre of Excellency”;
- ❑ Adopt “ The African Union Code Of Practice for Geothermal Drilling” by MS





Thank you for your Attention

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