



Signing Ceremony of the Collaborative Framework Agreement between GAK & UGI

Rome, Friday, 14th of October 2022

Topic: Kenya State of Play and Opportunities for Kenya-Italy Collaborations

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Geothermal Association of Kenya

INTRODUCTION TO GAK

- ☐ GAK is a national umbrella body that brings together geothermal stakeholders, encourages, facilitates and promotes coordination of activities related to local and worldwide research, development and application of geothermal resources.
- ☐ Introduction of delegation from Kenya through UNIDO/UGI partnership.
- ☐ **What We Do**
 - ☐ Advisory
 - ☐ Research
 - ☐ Advocacy
 - ☐ Training & information dissemination
 - ☐ Business to business / networking forums, among others.

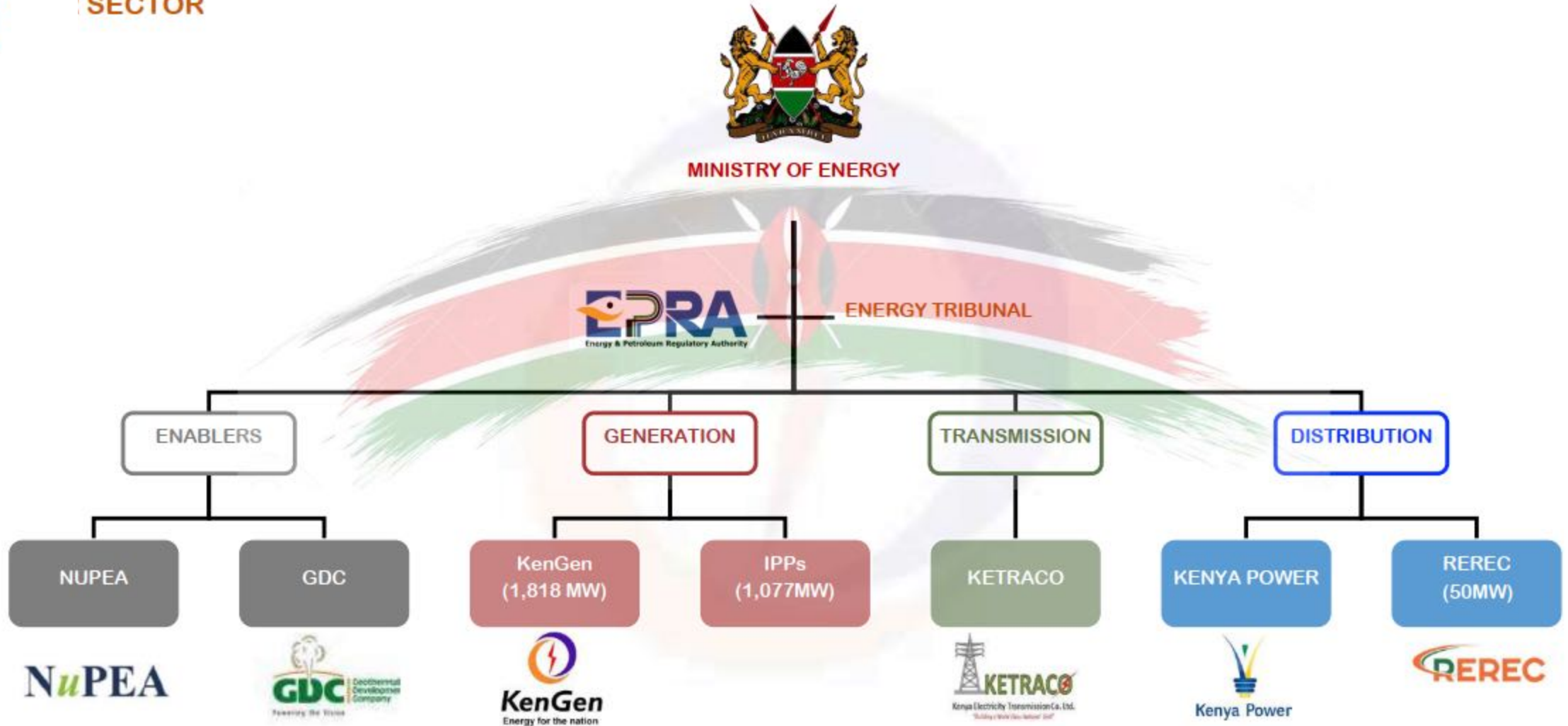
MEMBERSHIP

❑ Over 450 Professional Members.



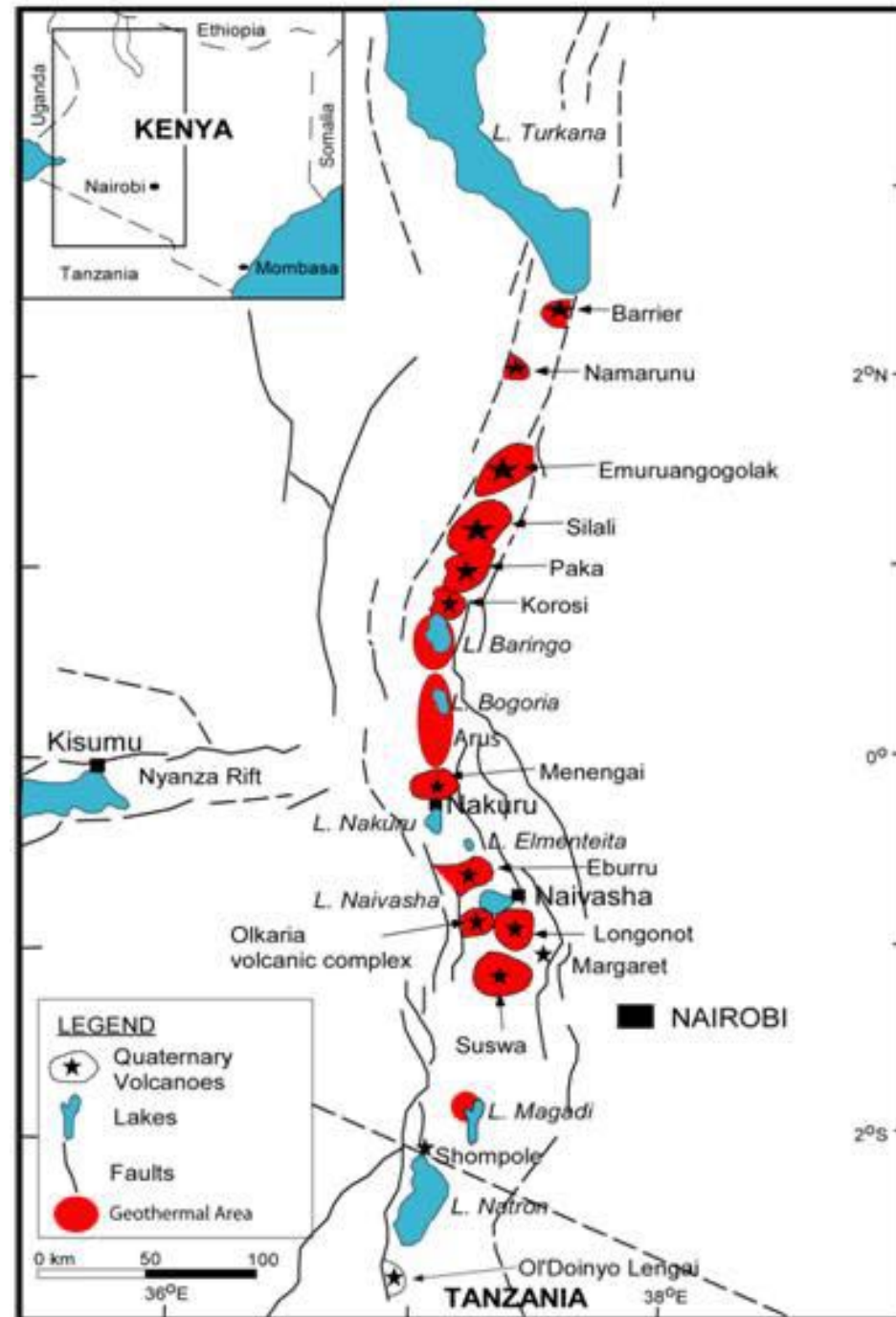
GEO THERMAL ENERGY IN KENYA

SECTOR



GEOHERMAL ENERGY IN KENYA

- Estimated Potential of 10,000 MWe.
- Only Olkaria and Menengai area extensively developed.
- Transmission requires a master plan
- Only about 9% developed since first well drilled in 1956.
- Kenya is first in Africa.
- National target to generate 100% electricity from renewable sources by 2030. As of 2021, 90% was renewable. Close to 50% from geothermal.





BRIEF ON GAK – UGI COLLABORATIVE FRAMEWORK AGREEMENT



- ☐ To develop a mutually beneficial working relationship for the sustainable development of geothermal resources.
- ☐ Deepening the working relations between the Kenyan and the Italian Geothermal Sectors.

BRIEF ON GAK – UGI COLLABORATIVE FRAMEWORK AGREEMENT

- ☐ Exchange of experience, information, know-how and technologies related to geothermal energy development,
- ☐ Capacity building activities such as training programs,
- ☐ In collaboration with IGA, develop geothermal standards,
- ☐ Prioritizing safety of operations in geothermal development,
- ☐ Based on a funding mechanism, organizing delegation tours to opposite countries,
- ☐ Fostering the formation of joint framework for public-private collaboration aimed at fast-tracking development of geothermal resources in Kenya,
- ☐ Enhancement public education and awareness campaigns,
- ☐ Both GAK and UGI shall support Italian companies/institutions get closer to the Kenyan market and vice versa,
- ☐ Collaboration on events to share information on technologies, financial products, best practices, among others.



Example of Development Plan

Target / objective	Output	Indicators	Activities
Stepwise Development of 140 MWe	Proof of Commercial Geothermal Resources & Construction of 140 MWe	Tariff Funding	Surface Studies & modeling & EIA studies
		Access roads	Procurement of Construction firms & construction of roads
		Prepare drilling sites	Site compaction & Cellar
		Provide water	Construct water pipeline, tanks & pump station
		Drill 2 exploration wells & Production wells	Procure drilling services & materials, drill if productive then production drilling & power plants

What are the risks in Geothermal?



Dry wells

Off-taker

Grid interconnectivity

Land rights

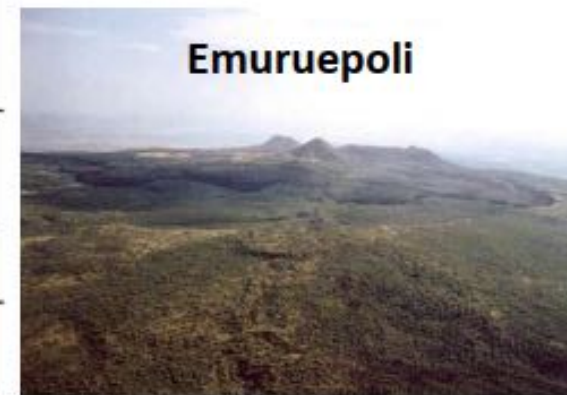
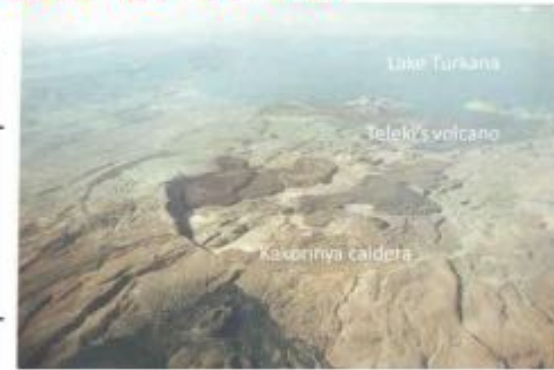
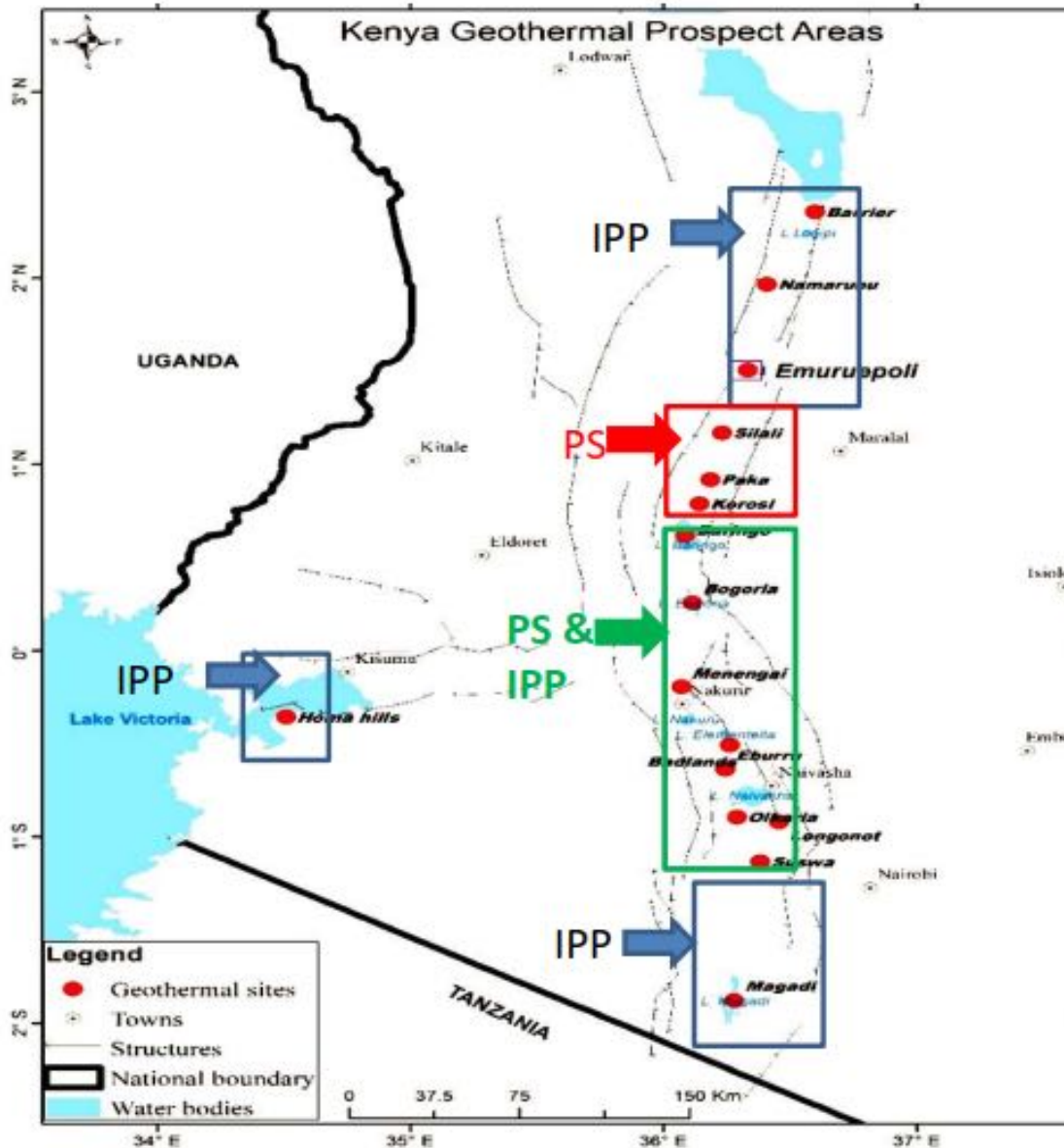
Properly Priced PPA

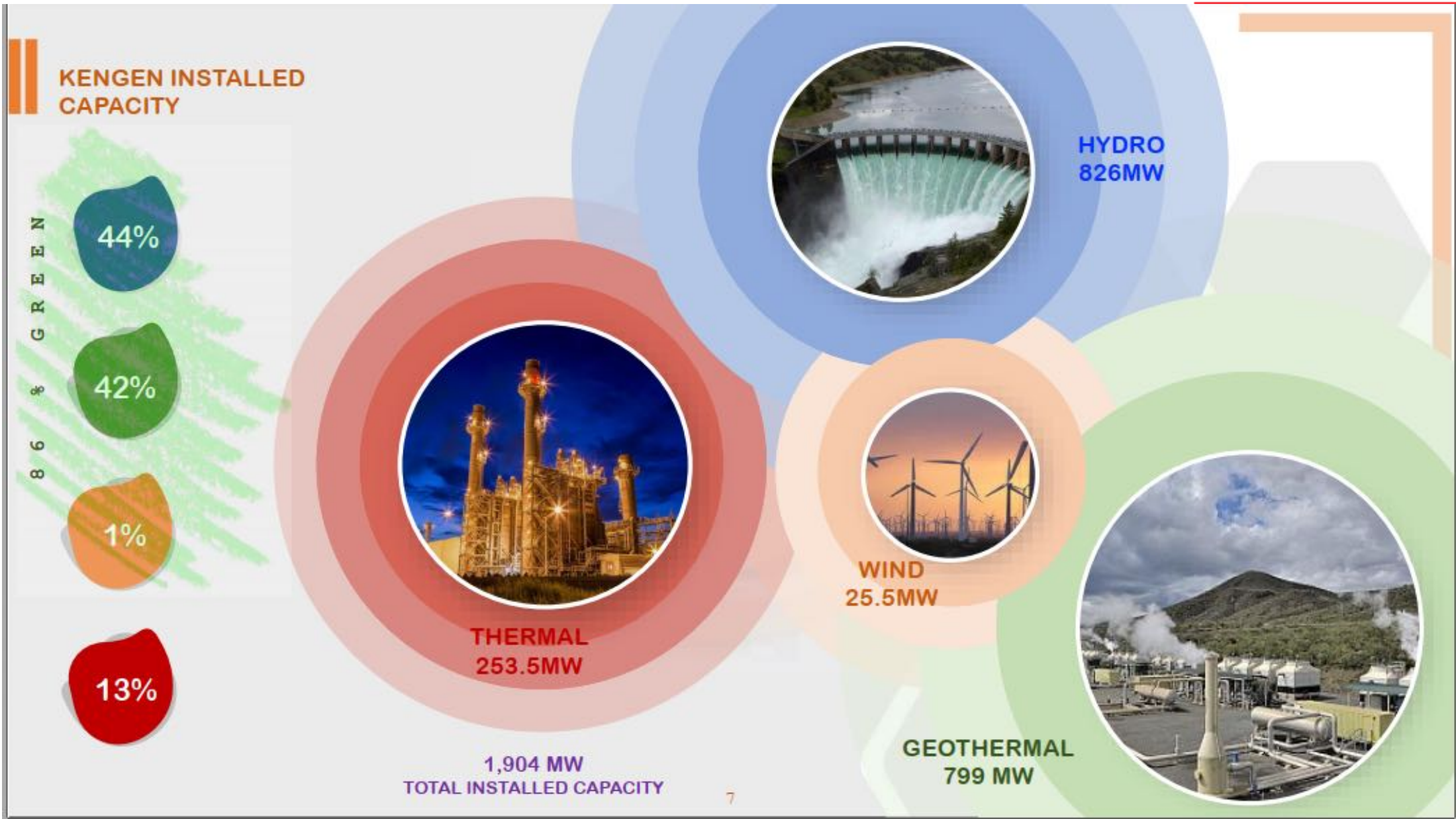
Political risks

Social impact risks

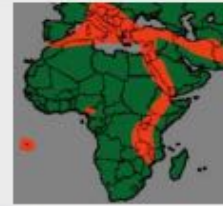
Ease of access to permitting eg Construction Permits, Water rights, etc

Concessions owned by Public sector & IPPs





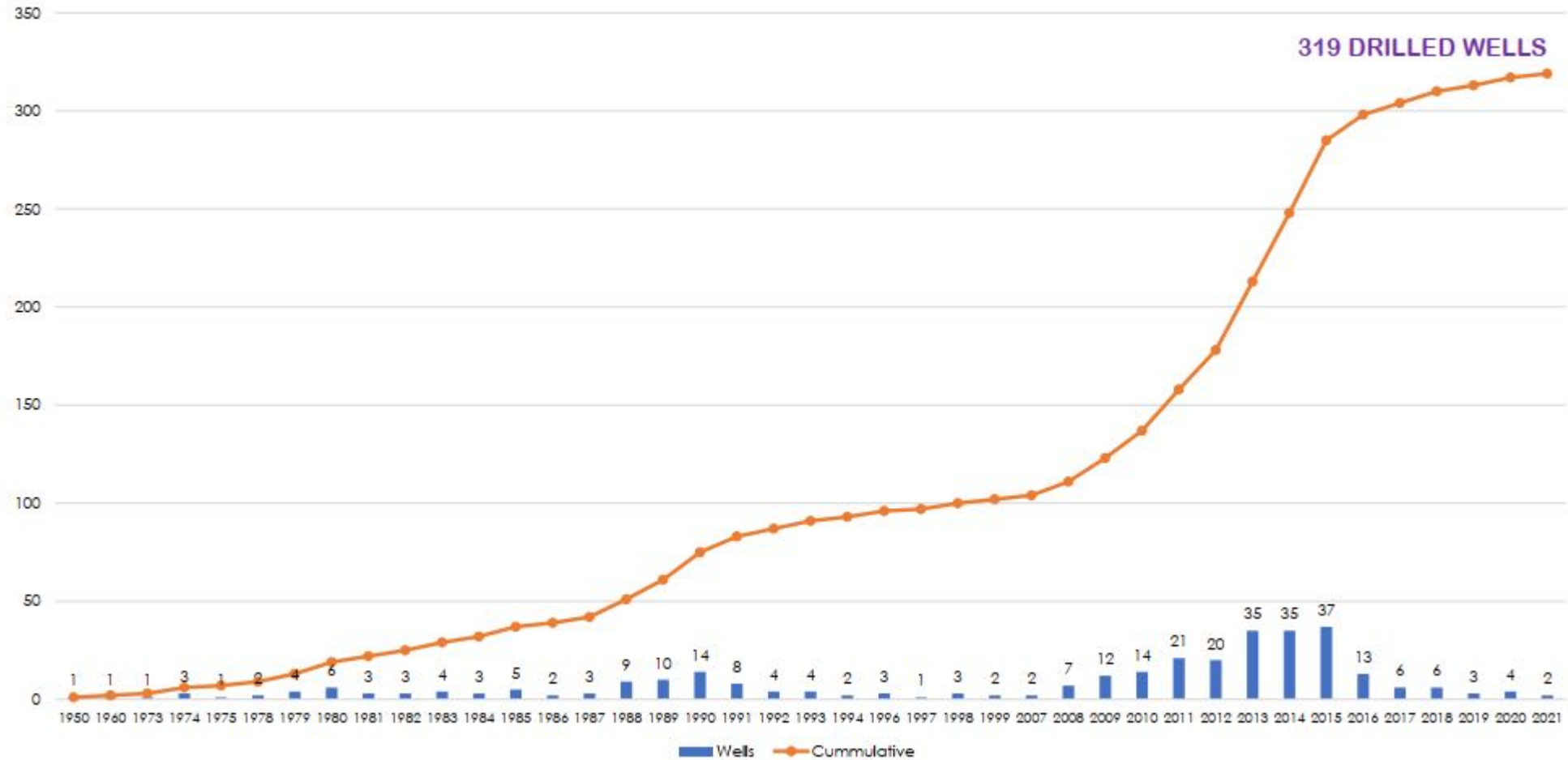
GEOTHERMAL POTENTIAL IN AFRICA



☐ Current project – Geothermal Continental Master Plan.

☐ Being developed by Africa Union – European Commission.

GEOHERMAL DRILLING PERFORMANCE





TOP PRODUCERS

SAVING: USD 54,000,000

OW-38



18MW

OW-52



18.8MW

OW-921A



30MW

☐ Geothermal Development Company

MANDATE

Upfront Works

- Remove upfront risks
- Reduce costs through infrastructural development, exploration works and production drilling

Direct Use

- Promote direct uses of geothermal

Capacity Development

- Develop human capacity
- Manage public resources such as rigs
- Provide consultancy services

Funding

- Support GoK in fund mobilization

Power Plant

- Support Private Sector entry
- Sell steam to power producers



CORE ACTIVITIES

- Prospecting
- Drilling
- Field development
- Well testing
- Reservoir management



- Special purpose vehicle – early stage exploration and drilling.
- Selling steam to IPPs for construction of power plants

Geothermal Development Company

- ☐ Rigs and associated equipment including spares
- ☐ Drilling materials and services
- ☐ Geo-exploration tools, instruments and equipment.
- ☐ Steam field design, equipment supply and steam pipeline construction services
- ☐ Various consulting services including feasibility studies
- ☐ Direct geothermal resource uses.

INDIRECT OPPORTUNITIES



- ☐ Provision of specialised engineering services
- ☐ Supply of generation equipment-both wellhead and conventional power plant
- ☐ Supply and construction of transmission lines and substations
- ☐ Civil construction works
- ☐ Insurance Services

☐ GDC



PUBLIC PRIVATE PARTNERSHIP - OPTION

		GENERATION OPTION	JOINT STEAM DEVELOPMENT	ORMAT	LONGONOT/ AKIRA		
VIABILITY ANALYSIS	DETAILED SURFACE STUDIES		GDC			EQUITY FINANCE OR SOVEREIGN LOAN	
	INFRASTRUCTURE DEVELOPMENT			GDC			
	EXPLORATION DRILLING						
	APPRAISAL DRILLING	GDC					
	FEASIBILITY STUDY		GDC	IPP			
IMPLEMENTATION	PRODUCTION DRILLING				IPP	EQUITY & DEBT FINANCE	
	STEAM GATHERING			IPP			
	POWER PLANT CONSTRUCTION						
INCOME	OPERATION AND MAINTENANCE	IPP	IPP			REVENUE FINANCE	
	STEAM FIELD MANAGEMENT	GDC	GDC				

☐ GDC

Other opportunity areas

- ❑ Mineral extraction
- ❑ Direct uses: daily milk products, green house farming, etc.
- ❑ Promoting electric mobility



GDC Direct Use Pilot Projects

1



Geothermal-Heated
Grain Dryer

2



Geothermal-Heated Milk
Pasteuriser

3



Geothermal-Heated
Greenhouse

4



Geothermal-Heated
Laundromat

5



Geothermal-Heated Fish
Pond

Other opportunity areas



❑ Power Plants

Olkaria	Wellheads IV (Additional LCPDP)	Planned	2025	30
Olkaria	Olkaria VI Unit 1	Planned	2024	70
Olkaria	Olkaria VI Unit 2	Planned	2024	70
Olkaria	Olkaria VII	Planned	2025	140
Olkaria	Olkaria 8 (LCPDP)	Proposed	2028	140
Olkaria	Olkaria 9 & other fiels (LCPDP)	Proposed	2035	420
Eburru	Eburru 2	Planned	2023	25
Menengai	Menengai I (OrPower 22 Limited)	Planned	2025	35
Menengai	Menengai II (Quantum Power limited)	Planned	2025	35
Menengai	Menengai III (Sosian Energy Limited)	Under construction	2023	35
Menengai	Menengai I Stage 2 (LCPDP)	Proposed	2025	60
Menengai	Menengai III (LCPDP)	Proposed	2028	100
Menengai	Menengai IV (LCPDP)	Proposed	2032	100
Menengai	Menengai V (LCPDP)	Proposed	2035	100
Baringo Silali - Paka	Baringo Silali - Paka I (LCPDP)	Proposed	2029	100
Baringo Silali - Korosi	Baringo Silali - Korosi I (LCPDP)	Proposed	2032	100
Baringo Silali - Silali	Baringo Silali - Silali I (LCPDP)	Proposed	2031	100
Suswa	Suswa I (LCPDP)	Proposed	2031	100
Suswa	Suswa II (LCPDP)	Proposed	2035	100
Suswa	Suswa III (LCPDP)	Proposed	2038	100
Akiira	Akiira I	Planned	2026	70
Akiira	Akiira II	Planned	2031	70
Longonot	AGIL Longonot Stage 1 (LCPDP)	Proposed	2030	70
Barrier	Barrier	Proposed	2035	160

The End

Thank you for your attention

Get more information on www.gak.co.ke