

ROLE OF POLICIES AND REGULATORY INSTRUMENT IN SPURRING GEOTHERMAL DEVELOPMENT IN KENYA.

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A presentation to Participants of IRENA Virtual Workshop to Share findings of publication of the Geothermal Report for East Africa. Tuesday, 27 July from 11:00h – 13:00h (EAT)

OVERALL MANDATE OF THE MINISTRY



As Per Executive Order no. 1 of May 2018



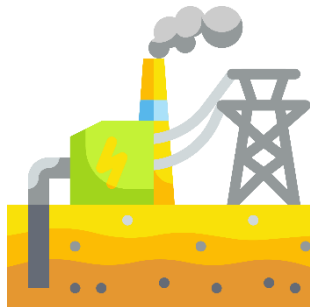
**National Energy Policy,
Development and
Management**



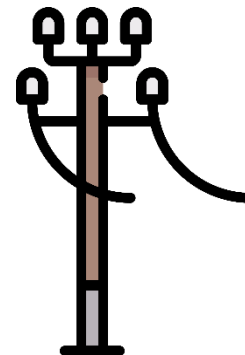
**Hydropower
Development**



**Thermal Power
Development
(Includes
Nuclear Power)**



**Geothermal Exploration
and Development**



**Rural Electrification
Programme**



**Promotion of
Renewable
Energy**



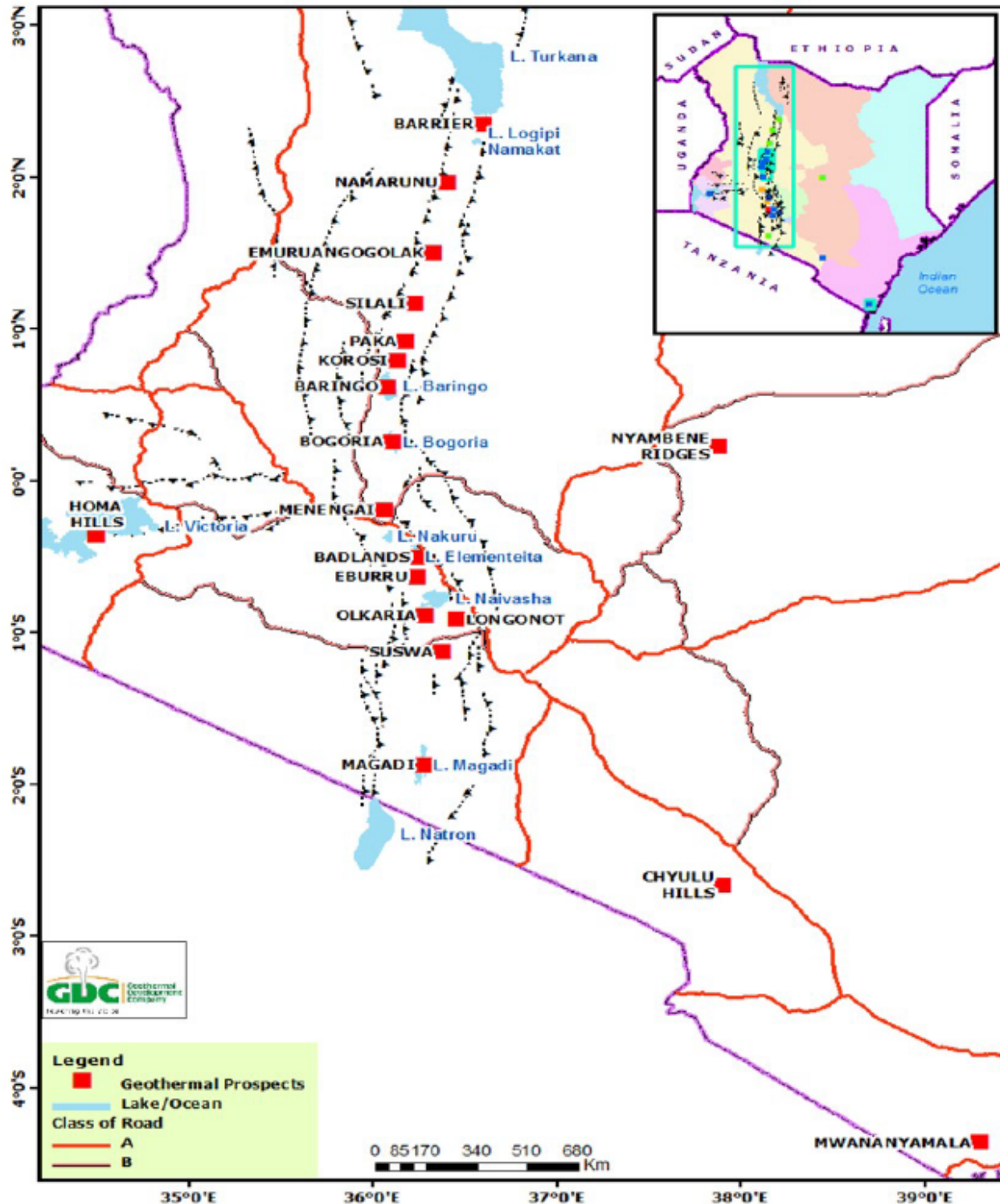
**Energy Regulation,
Security and
Conservation**



Geothermal Energy Resource

- ❖ Kenya is endowed with vast geothermal resource potential along the Rift Valley that transects the country from north to south.
- ❖ Exploration has so far reveals that geothermal potential exceeds 10,000 MWe and is capable of meeting all of Kenya's electricity needs over the next 20 years.
- ❖ Harnessing these resources can provide a renewable, affordable and stable electricity supply. It can also help Kenya to fulfil the 2030 Agenda for Sustainable Development and climate goals set out in the Paris Agreement.

Geothermal Prospects, Kenya

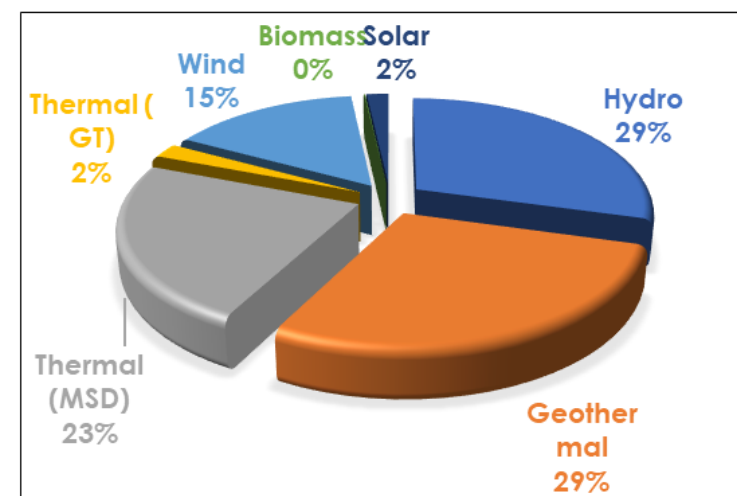


- ✓ Suswa,
- ✓ Longonot,
- ✓ Olkaria,
- ✓ Eburru,
- ✓ Menengai,
- ✓ Arus-Bogoria,
- ✓ Lake Baringo,
- ✓ Korosi,
- ✓ Paka,
- ✓ Lake Magadi,
- ✓ Badlands,
- ✓ Silali,
- ✓ Emuruangogolak,
- ✓ Namarunu
- ✓ Barrier
- ✓ Mwananyamala
- ✓ Homa Hills
- ✓ Nyambene Ridges
- ✓ Chyulu Hills

CURRENT INSTALLED POWER GENERATION MIX

Kenya has a low-carbon and diverse energy mix

Generation Type	Apr-21		
	Installed MW	Effective MW	% contribution
Hydro	837.60	808.70	29.85%
Geothermal	811.14	767.56	29.72%
Thermal (MSD)	660.32	640.42	23.64%
Thermal (GT)	60.00	56.00	2.07%
Wind	435.50	425.50	12.02%
Biomass	2.00	2.00	0.07%
Solar	50.25	50.25	1.85%
Interconnected System	2,857	2,750	98.82%
Off grid thermal	31.9	21.5	0.71%
Off grid wind	2.26	1.90	0.00%
Off grid solar	0.55	0.00	0.07%
Imports	0	0	0.00%
Total Capacity MW	2,891	2,774	100.00%



- **Generation capacity** is now 2,891 MW (36% of the capacity is from the private sector)
- **Renewable energy** share is 73% of installed capacity and 90% of total power dispatched
- **Geothermal** share is close to 50% of total power generation making Kenya one of the global leaders



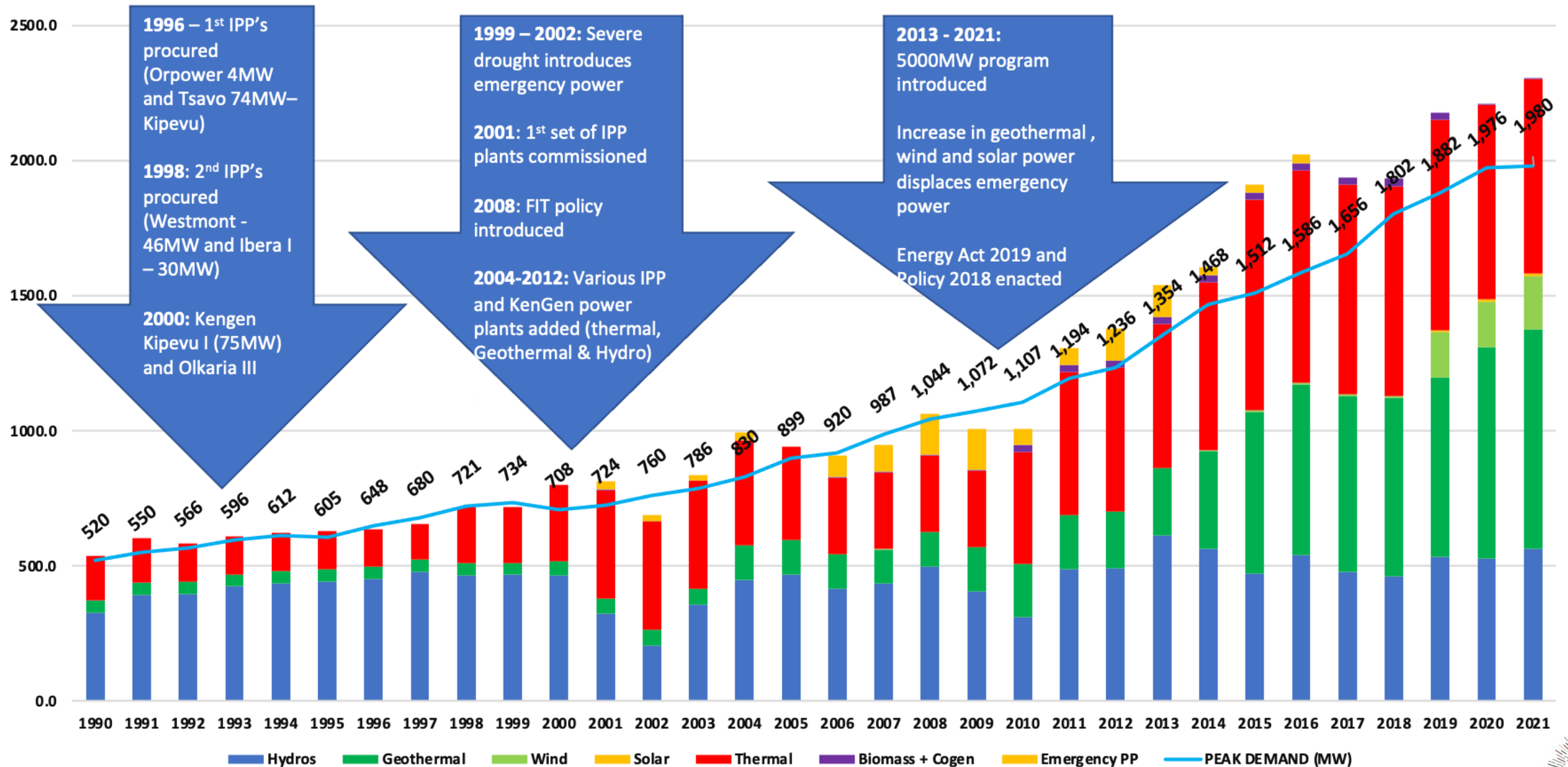
Policies and Regulations

- ❖ Policies drive the pace of Geothermal Development Priorities through allocating budgetary resources, mobilizing concessional and private financing
- ❖ Regulations ensure a level playing field for all players, provide enabling investment environment and determine the generation sequencing and the manner of final electricity dispatch.
- ❖ For instance, Govt.'s commitment of a regular annual budget through GDC as seed money to leverage financing from bilateral and multilateral partners has unlocked funds for upstream geothermal development
- ❖ A PPP unit has been created at Treasury to facilitate private sector participation in geothermal projects



HISTORICAL JOURNEY OF IPP'S (1990 – 2021)

AVAILABLE CAPACITY VS PEAK DEMAND (MW)



GEOHERMAL PUBLIC-PRIVATE PARTNERSHIP OPTIONS

		POWER GEN. OPTION	JOINT STEAM DEV.	PROD. DRILLING & POWER GEN	STEAM DEV. & GEN.	FULL CONCESSION					
VIABILITY ANALYSIS	DETAILED SURFACE STUDIES	GDC	GDC		GDC	EQUITY FINANCE OR SOVEREIGN LOAN					
	INFRASTRUCTURE DEVELOPMENT		GDC					GDC			
	EXPLORATION DRILLING							IPP			
	APPRAISAL DRILLING									IPP	
	FEASIBILITY STUDY										
IMPLEMENTATION	PRODUCTION DRILLING	IPP	IPP		EQUITY & DEBT FINANCE						
	STEAM GATHERING						IPP				
	POWER PLANT CONSTRUCTION						IPP				
INCOME	OPERATION AND MAINTENANCE	IPP	GDC		REVENUE FINANCE						
	STEAM FIELD MANAGEMENT						GDC				

Impact of the PPP options on tariffs

Example: A 50 MWe power plant

Scenario 1: IPPs Entering BEFORE Test

Drilling

**14 – 17 US
cents per kWh**

Investors prefer this option – RoI of approx.25%, hence better returns

Scenario 2: IPPs entering after Test

Drilling (GDC has removed most of the
upfront risks

**6.5 – 10.5 US
cents per kWh**

GDC prefers scenario II since it lowers tariffs thus lower business and living costs (RoI – 18%- still good hence a win-win approach for investors and the country



THANK YOU ...

