Kenya's Energy Demand and the role of Nuclear energy in future energy generation mix

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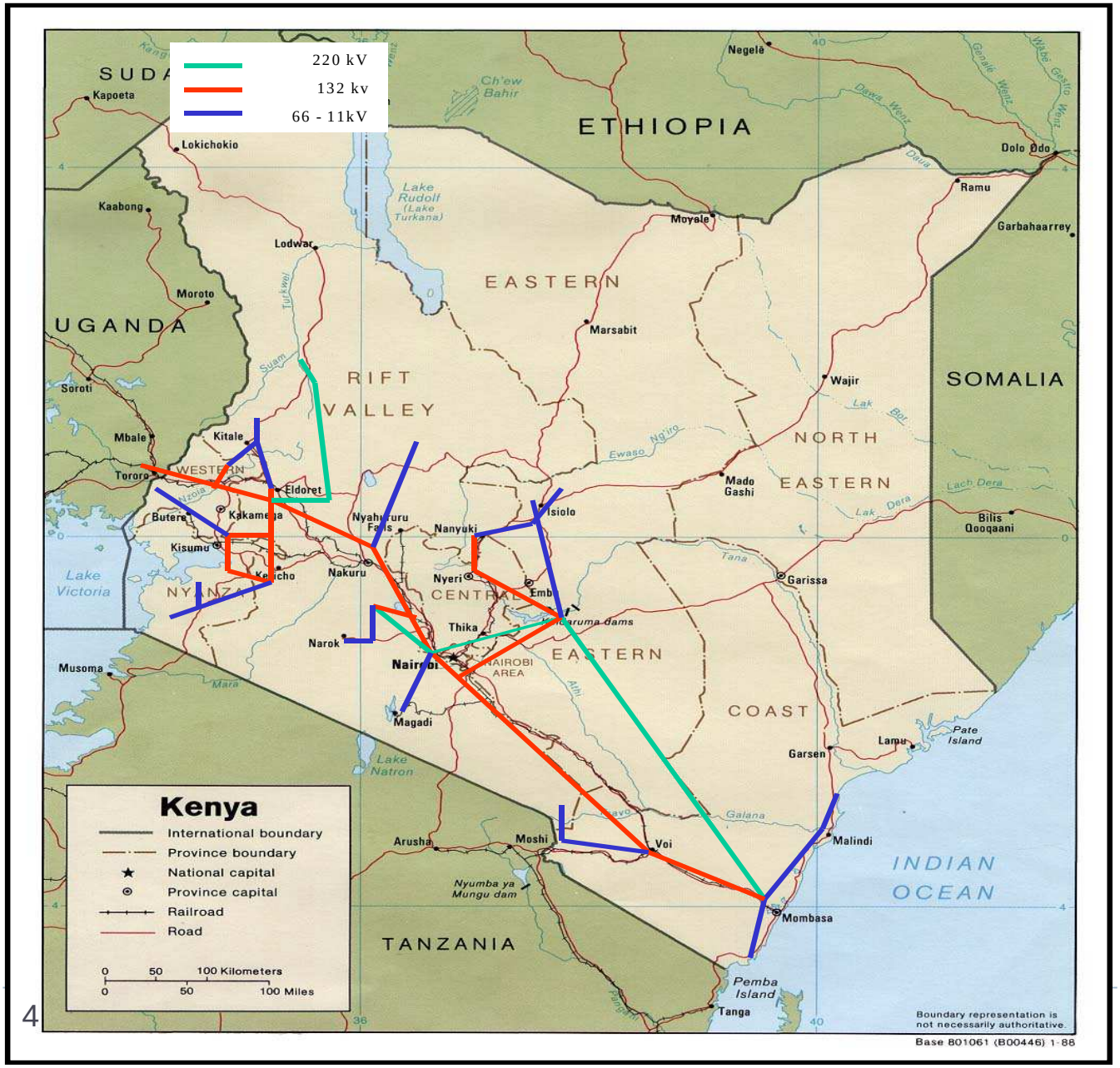
Statistics on Kenya

- ✓ Population: 40million
- ✓ GDP per capita - $900
- ✓ National currency: Kenya Shilling (ksh): Ksh 84 =1USD (May 2012)
- ✓ Installed Power Capacity: 1,533MW
- ✓ Peak Demand 1,236MW (March 2012)
- ✓ Total area – 580, 367 Sq Km

The Current Power Supply in Kenya

Sources (MW)	Installed Capacity (MW)	Capacity % Share
Hydro	761	49.7%
Thermal	525	34.2%
Geothermal	198	12.9%
Cogeneration	26	2.4%
Wind	5.45	0.36%
Isolated grid	18	1.15%
Total	**1,533**	**100%**

The Kenya Transmission & Distribution Network



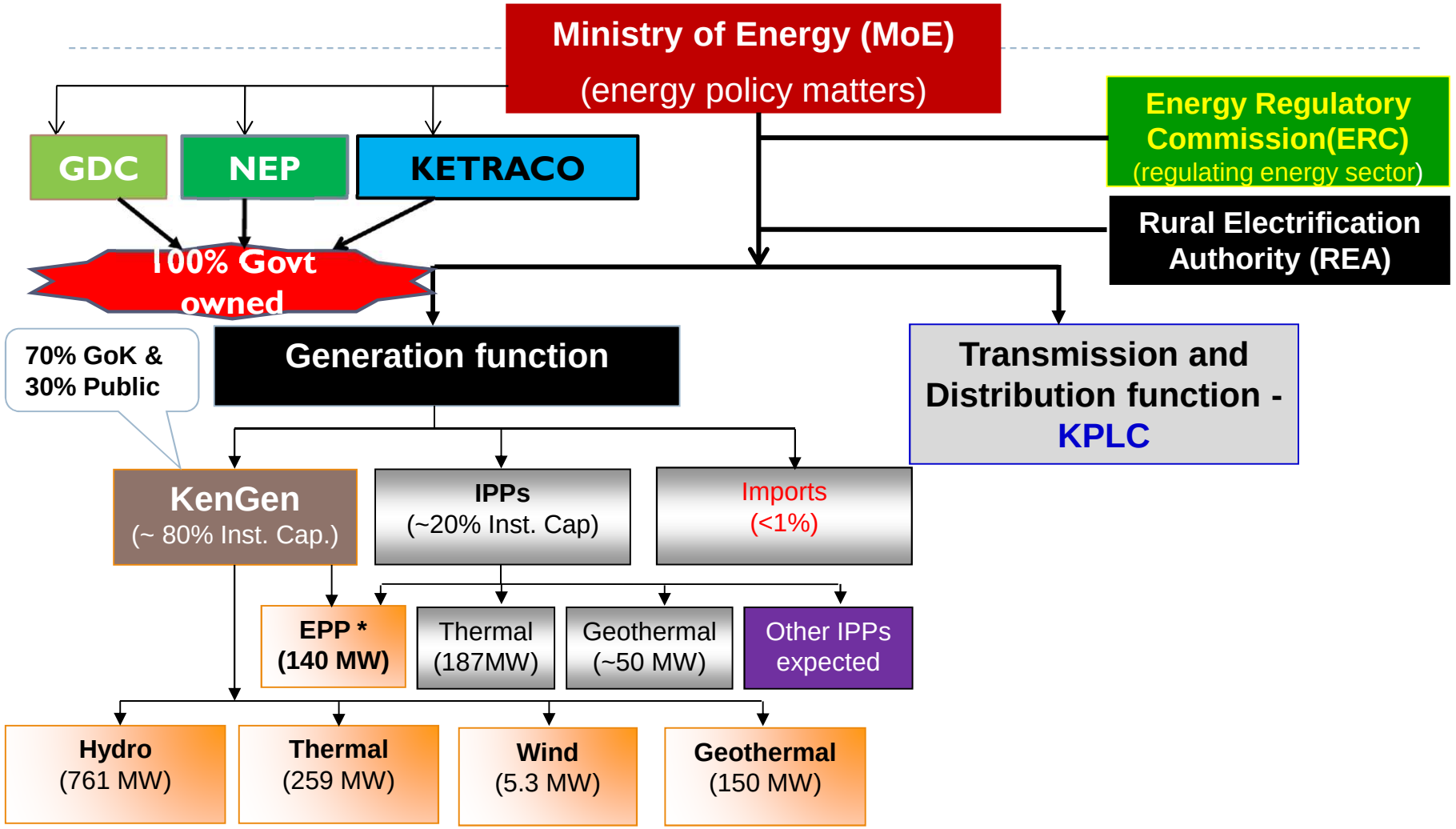
National Electricity:

Connectivity 28%

-Urban – 54%

-Rural – 22%

National Energy Sector Institutional Framework



Prevailing conditions in the Energy sector

- Low electrification levels
- High grid and related system losses
- Persistent power Interruptions and Power shortages
- High electricity prices
- Unstable power prices caused by volatile oil prices
- The institutional governance and related operational challenges including lack of synergy and duplication


Kenya Vision 2030

POWER IS A 2030 KEY ENABLER FOR KENYA VISION

Key Enabler:

A vibrant power sector that meets electricity required to drive flagship projects and programmes

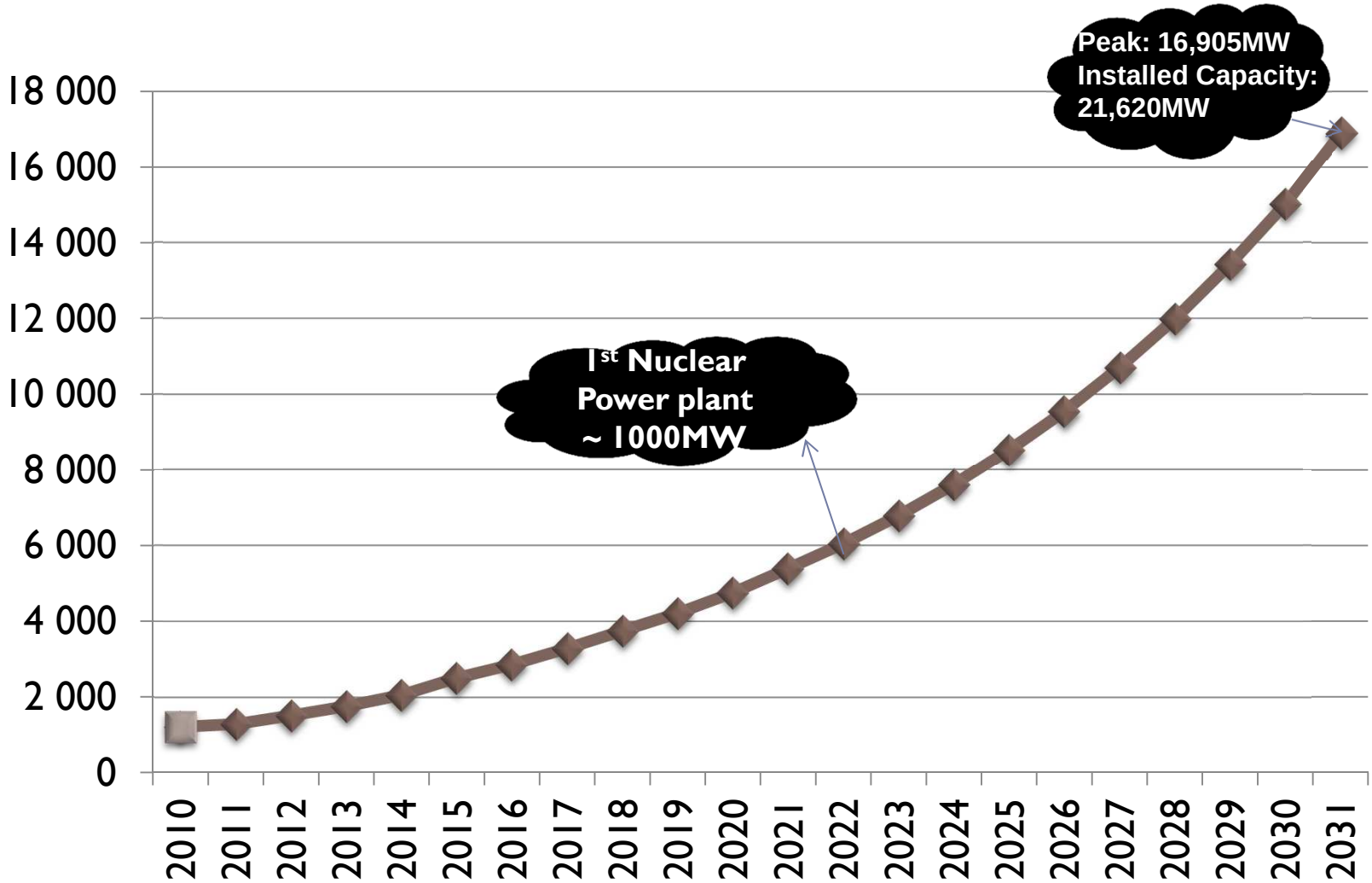
Why nuclear power for Kenya?

- Provision of adequate capacity for an ambitious economic development programme (Kenya Vision 2030)
- To provide stability in power supply
- Provision of efficient and reliable power
- Lower cost of power - an economic alternative to fossil fuels
- Provide adequate power that is environmentally friendly and clean
- Availability of nuclear global peer review and support
- Technology is mature and proven

2031 installed Capacity – by generation type

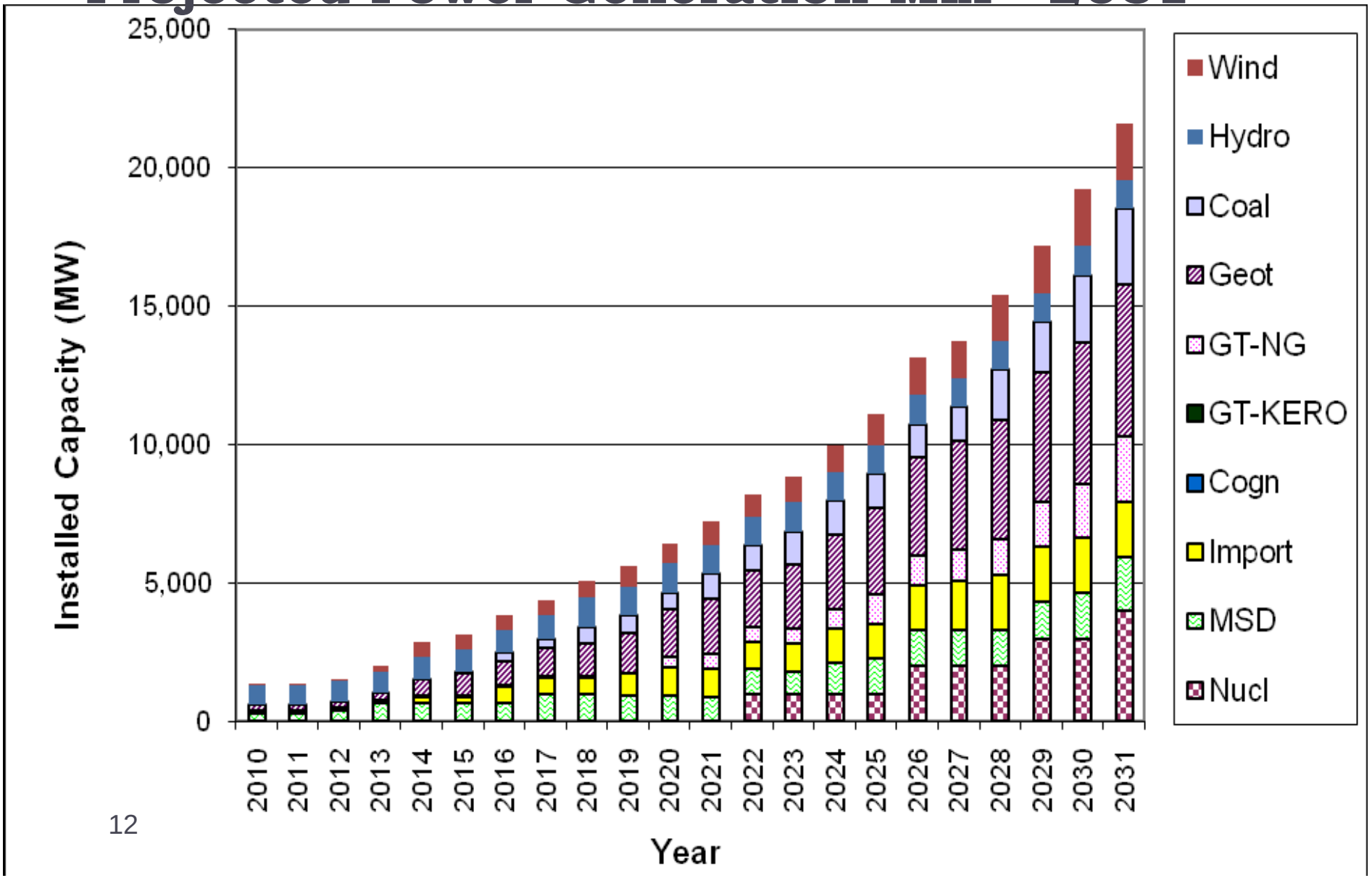
Technology	Capacity (MW)	Percentage of total
Geothermal	5,530	26
Nuclear	4,000	19
Coal	2,720	13
GT-NG	2,340	11
MSD	1,955	9
Import	2,000	9
Wind	2,036	9
Hydro	1,039	5
Total	**21,620**	**100**

Peak Power Demand Projection for Kenya (MW)



Source: Least Cost Power Development Plan 2011/2031

Projected Power Generation Mix - 2031



The National Position towards Nuclear Power generation in Kenya

- **Kenya member of IAEA since 1965**
- **The Nuclear Electricity Project Committee (NEPC)**

- Established vide the Kenya Gazette Notice no 20188 on the 19th November 2010 under the Ministry of energy MoE
- Mandate of NEPC is to drive the nuclear power programme and roadmap for Kenya.
- NEPC established a Secretariat that carries out the day to day activities of the institution.

Status of the Kenya's Nuclear Power Programme

- **Pre-feasibility study (PFS) for Kenya's nuclear power programme**

  A self assessment study with an inter-organizational team of assessors.

  Target implementation period is one year

- **Undertaking extensive public awareness**
- **Review of the Energy Policy and the Energy Bill to incorporate nuclear energy as one of the sources of energy in Kenya**
- **Development of the Atomic Energy Policy and the Draft Atomic Energy Bill**
- **Review of the Environmental Management & Coordination Act (EMCA)**

Capacity for Human Resource development for nuclear power

- **Development of a Capacity Building Programme**
  - 15 students sponsored by Government of Kenya (GoK) for Masters in Nuclear Science at The University of Nairobi
  - 6 Kenyan students currently studying at The Korea Institute of Nuclear Graduate School (KINGS) under sponsorship by both Government of Korea and Kenya
  - Collaboration Agreements on nuclear issues including capacity building with various countries.

- **The IAEA Technical Cooperation Project (TCP) titled 'Building Capacity for the Implementation of a Nuclear Power Programme currently under implementation**
  - 31Kenyans set to undergo training on various aspects of nuclear power in 2012 on this programme

National stakeholders involved in Kenya's nuclear electricity programme development.

- Ministry of Higher Education Science and Technology
- National Security Intelligence Service (NSIS)
- Energy Regulatory Commission (ERC)
- Kenya Electricity Generating Company (KenGen)
- Kenya Power & Lighting Company (KPLC)
- Kenya Electricty Transmission Company (KETRACo)
- Kenya Industrial Research and Development Institute
- Central Organization of Trade Unions
- Kenya Bureau of Standards
- Kenya Private Sector Alliance
- Ministry of State for National Development and Vision 2030
- Ministry of Industrialization
- Ministry of Environment and Mineral Resources
- Kenya Association of Manufacturers
- Kenya Institute for Public Policy Research and Analysis
- University of Nairobi

Challenges for Nuclear Power Programme Development

- Funding and Financing
- Human Resource development for an NPP - Inadequate local technical skills, technology and energy planning capacity
- Inadequate policy, legal and institutional framework for the operationalization of a Nuclear Power Programme
- Limitation in Electrical Grid infrastructure country wide and regionally

References

- Kenya Least Cost Power Development Plan 2011/2031
- Republic of Kenya 3rd Draft National Policy dated March 2012 (unpublished)
- Kenya country report presented on16 April 2012 by NEP at the training on Technical aspects on feasibility, contracting and construction of a nuclear plant held on 16th to 27th April 2012, Danjeon, Republic of Korea


Thank You