INPRO Dialogue Forum on the Potential of Nuclear Energy to Support the Sustainable Development Goals, Including Climate Change Mitigation

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KENYA NUCLEAR ELECTRICITY BOARD

KENYA'S NUCLEAR POWER PROGRAMME: A POTENTIAL MITIGATION TO CLIMATE CHANGE AND SOCIAL-ECONOMIC GROWTH

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Introduction

- Kenya covers an area of 81,309 km^2 (224,445 mi^2) with a population of approximately 48 million a GDP of $69.977 billion making it the 72nd largest economy in the world.
- Kenya is a signatory to the Paris Agreement 2015, to reduce the GHG emission.
- Kenya energy generation (Hydro, Geothermal, Wind, Solar, Thermal, Biomass)
- Impact of climate change in Kenya is real – Increased frequency and prolonged drought, higher temperatures, rising sea levels and food shortage.
- Kenya Nuclear Electricity development is meant to increase Power generation and protect the environment.

Map of Kenya


Anmelden
Boma National Park
Dilla
Finchawa
Mundri West
Juba
Kajo Keji
Kakuma
Arua
Gulu
Mahagi
Uganda
Marsabit
Baidoa
Buurhakaba
Somalia
Beledweyne
Mogadischu
مقديشو
Bungoma County
Kampala
Entebbe
Kisumu
Nakuru
Kenia
Dadaab
Jilib
Jamaame
Olenguruone
Migori
Nairobi
Kitui
Goma
Ruanda
Butare
Mwanza
Karatu
Arusha
Malindi
Mombasa
Burundi
Kigoma
Tabora
Tanga

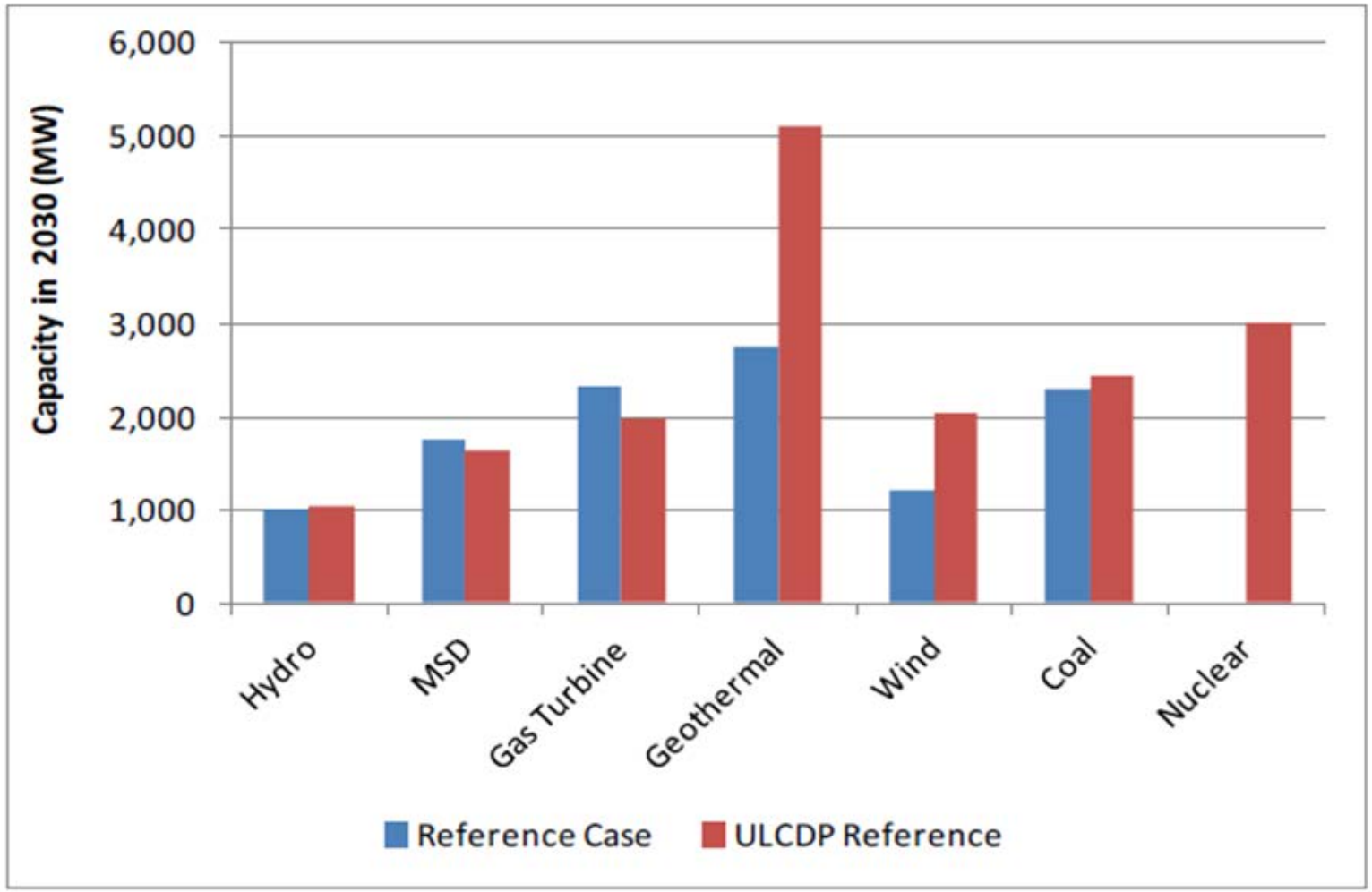
Kenya's nuclear power programme 1

- The Kenya Nuclear Electricity Board was established in 2010 to fast tracking the development of nuclear electricity generation in Kenya as a long term plan to meet its energy demand.
- The Kenya Vision 2030 is the country's long–term development blueprint that aims to create a globally competitive and prosperous country providing a high quality of life for all its citizens in a clean and secure environment
- Vision 2030 has identified energy as an enabler of economic and industrial growth
- Kenya is considering to include nuclear power in its energy mix by 2027 to meet its growing domestic and industrial demand for electricity supply and also because it is safe and environmentally friendly (Meeting SDG no. 7 & 13 on affordable and clean energy and climate action)

Kenya's nuclear power programme 2

- The need for nuclear energy is elaborated in the ULCPDP, 2011 and in the 15 years SAP for the nuclear power programme, 2013 which guides the energy sector on how it will meet its energy demands for the future needs.
- Currently, access to electricity in Kenya is about 36% (World Bank report 2016)
- Kenya has about 2500MW of installed capacity with a generation energy mix comprising of 52.1% from hydro, 32.5% from fossil fuels, 13.2% from geothermal, 1.8% from biogas cogeneration and Solar PV and Wind power contributing to less than 1%
- Thermal energy makes up for shortfalls of hydroelectric power in the dry season
- The demand for electrical energy is projected to rise to about 6GW in 2022 and 15 GW in 2030 (Strategic Plan for a Nuclear Power Programme in Kenya, 2013)
- The Updated LCPDP, 2011 projects that by 2030, 26% of the total installed capacity will be obtained from geothermal, 19% from Nuclear Plants, 13% from coal plants and 9% from import while Wind and Hydro plants will provide 9% and 5% respectively

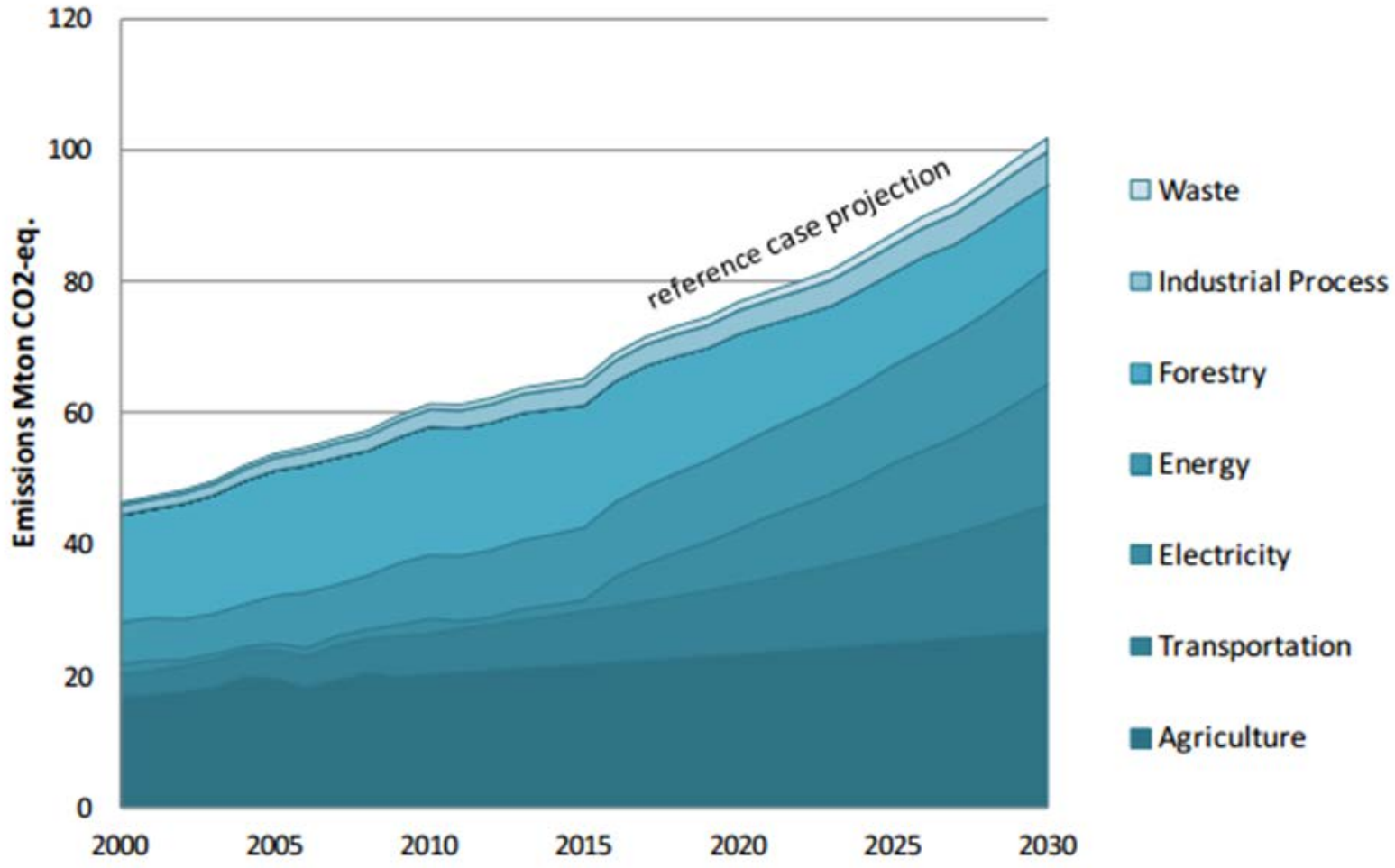
Comparison of installed capacity in 2030 (Kenya's Climate Change Action Plan: Mitigation, 2012)



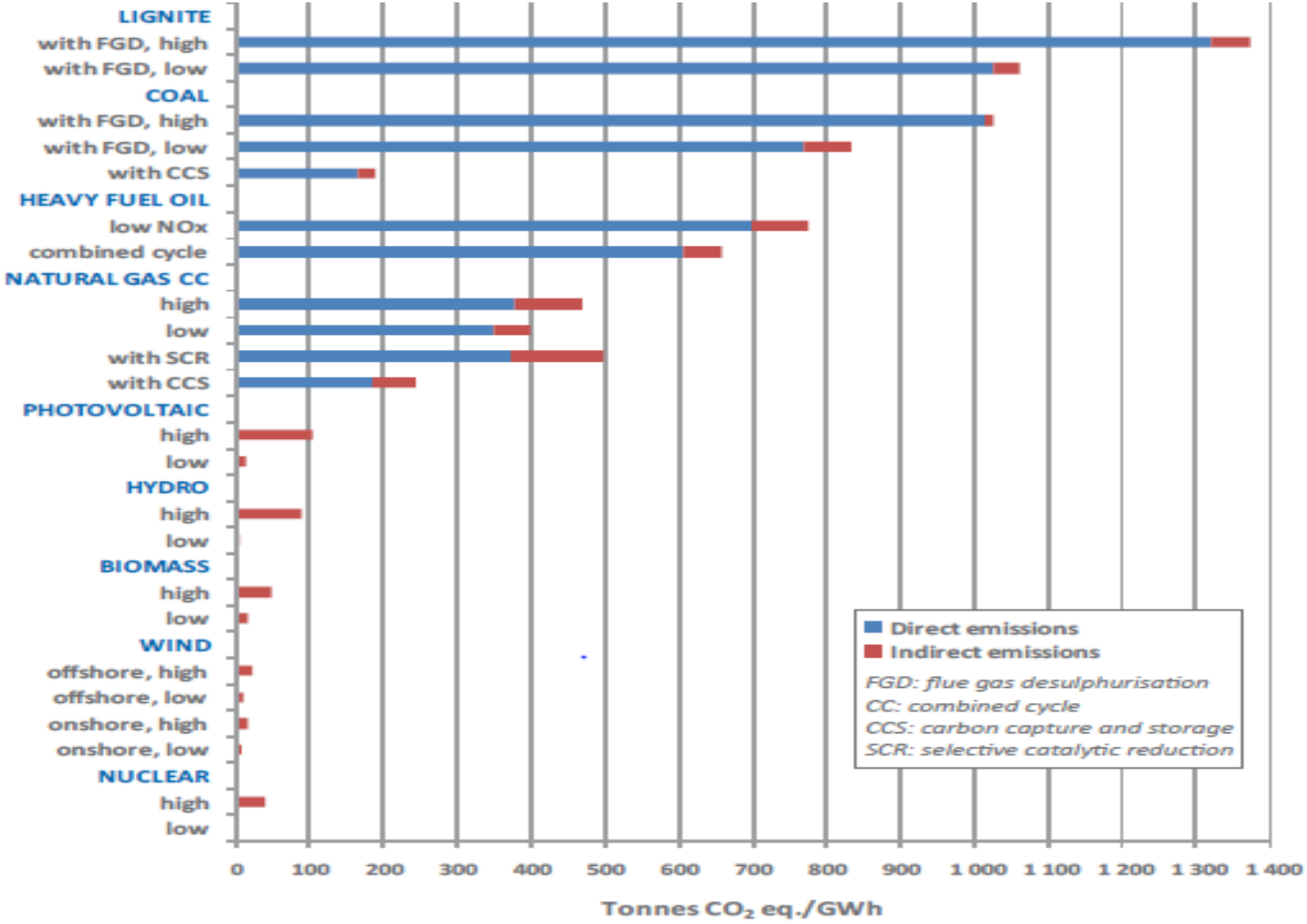
GHG emission in Kenya

- On 6 May 2016, Kenya's Climate Change Act, 2016 became law
- The Act provides a framework for action that promotes low carbon and climate resilient energy development in Kenya
- Kenya's total GHG emissions in 2013 was 60.2 million metric tons of carbon dioxide equivalent (MtCO2e), totaling 0.13% of global GHG emissions.
- The agriculture sector emitted 62.8% of total emissions, followed by the energy sector (31.2%), industrial processes sector (4.6%), and waste sector (1.4%).
- Kenya's Intended Nationally Determined Contribution (INDC) commits to reducing GHG emissions by 30% (143 MtCO2e) by 2030

Projected CO_2 emissions by 2030 (Kenya's Climate Change Action Plan: Mitigation, 2012)



CO_2 emission for different energy sources



Source: *Mitigation of Climate Change*, Intergovernmental Panel on Climate Change, 2007.

Why Nuclear in Kenya

- To meet the growing demand for electricity
- The energy sector has the potential to reduce GHG emission by introducing low-carbon energy plants like nuclear power plants hence contributing to global warming solution
- Nuclear power will stabilize and reduce the cost of electricity hence making energy reliable and affordable
- Reduce dependency on oil
- Increase irrigation, food production and provision of clean water to reduce waterborne diseases.

Impact of climate change in Kenya

Impact of climate change in Kenya

Plans to reduce CO_2 emission in Kenya

- The Government plans to reduce the emission through enforcement of the National Climate Change Action Plan (NCCAP) by;

1. expansion of geothermal, solar, and wind energy production,
2. enhancement of energy and resource efficiency
3. progress towards achieving tree cover of at least 10% of Kenya's land area (cut 1 plant 10 initiative)
4. increased use of clean energy technologies to reduce over reliance on wood and fossil fuel
5. adoption of low carbon and efficient transport system
6. improved waste management by waste recycling and landfill gas management (Kenya's Climate Change Action Plan: Mitigation, 2012)

Conclusion

- Kenya like many Sub-Sahara African counties is paying a heavy price as a result of climate change
- Kenya has made a decision to add Nuclear Power in its energy mix by 2027 to address the increasing power demand, protect the environment, reduce the power cost and increase industrialization.
- Kenya NPP is in phase I according to the IAEA nuclear power development guideline but the Energy bill is expected to be enacted anytime since it has gone through parliament. It will provide for the establishment of the Regulator, operator and Nuclear Research to support the whole programme.

References

1. Kenya's Climate Change Action Plan: Mitigation, 2012
2. Ministry of Environment and Natural Resources. 2002. First National Communications of Kenya tit eh Conference of the Parties to the United National Framework Convention on Climate Change (UNFCCC). Nairobi: Republic of Kenya, Ministry of Environment and Natural Resources.
3. National Climate Change Action Plan 2013 – 2017. Government of Kenya, 2013
4. Strategic Plan for a Nuclear Power Programme in Kenya, 2013
5. The Kenya Vision 2030. The Government of Kenya, 2007.
6. Updated Least Cost Power Development Plan 2011-2030, Republic of Kenya, 2011

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