



100% Renewable Energy Plan for Kenya by 2050

“Part of the EASE-CA project”

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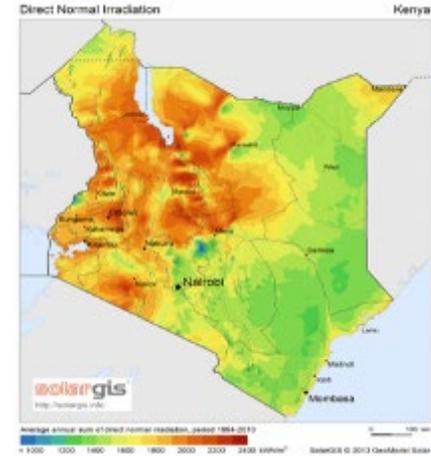


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<http://www.inforse.org/INFORSE> at HLPF2020.php and

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ENERGY STATUS IN KENYA



Electrification

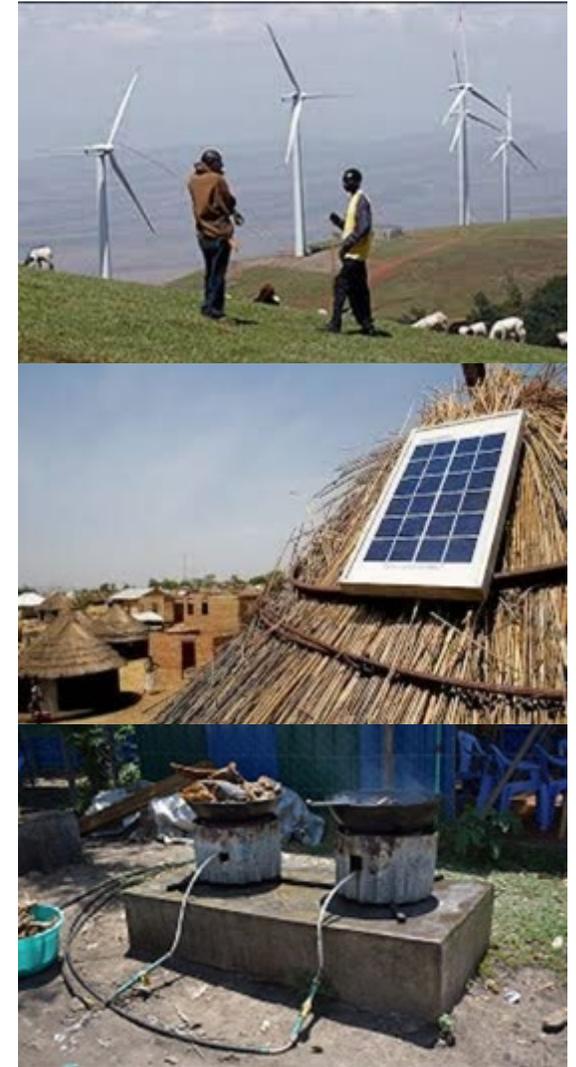
- In 2019, 75% of Kenyans had access to electricity (*Directorate of Renewable Energy, Ministry of Energy of Kenya, 2019*). The number of connected households tripled from 2.3 million in 2013 to 6.9 million in 2018.

Cleaner cooking

- Kenya has an ambitious target of achieving 100% access to modern cooking services by 2030, including efficient cook stoves for wood and charcoal, household biogas, LPG stoves, and others.
- Government is running the development and promotion of efficient cook stoves for households and institutions.
- Government is collaborating with Clean Cook stove Alliance of Kenya (CCA-K) to promote the development and dissemination of efficient cook stoves.
- A clean cooking component of the Kenya off-grid Solar Access project (KOSAP) (VNR, 2020, Kenya Report) seeks to disseminate 150,000 efficient cook stoves for households in selected 14 under-served counties.
- Cleaner cooking is an important part of Kenya's climate plans and is included in the Kenya's National Determined Contributions (NDC) to the UNFCCC Paris Agreement

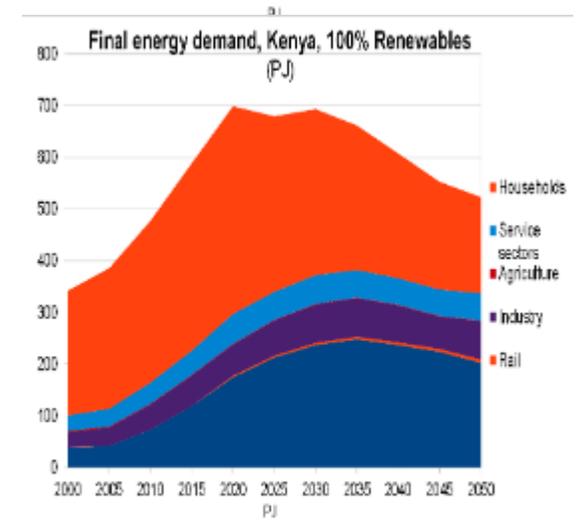
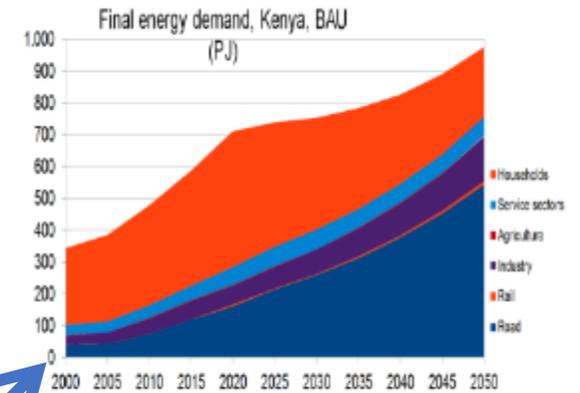
Renewables in Kenya

- Renewable energy currently accounts for 70% of the installed power capacity including large hydro-power. It accounts for more than 70% of the power generation, but production varies from year to year with hydropower production that is low in dry years.
- Government is supporting a Solar PV electrification of public institutions, including health facilities. So far, 1,500 institutions have been electrified.
- Under the Feed-in-Tariff (FiT) policy, 278 renewable energy projects with a combined capacity of over 4.7 Gigawatts have been approved and are at various stages of implementation. This includes wind power, geothermal power, and solar PV power projects.
- Kenya recently commissioned three renewable power projects: 310 MW wind (Lake Turkana wind power project), 100 MW Kipeto (Kajiado) and 51 MW solar (Garissa).



Kenya's Demand for Energy

- Population grows, from 48 mill. today(2019), to (maybe) 84 mill. in 2050
- GDP continue to grow, 5.7%/year in average, GDP 5 times bigger in 2050 than in 2020, change from lower middle income country to higher middle income country.
- Demand for cooking, transport, light, industry etc. (energy services) will grow with population and GDP.
- Increasing energy efficiency will limit growth in energy demand for cooking, transport, light, industry etc.; but without new actions, energy demand will still grow.
- With new, efficient technology, large demands for fuel can be replaced with much smaller demands for electricity: charcoal replaced with electric smart cooking, diesel vehicles with electric vehicles etc.



Potential for Renewables in Kenya

- Geothermal power 8500 MW, around 801 MW developed today
- Windpower, 500,000 MW in best wind classes, 300 MW today
- Solar power > 75,000 MW, around 50 MW developed today (off-grid)
- Hydro power theoretical 6000 MW, practical 1100-1200 MW, 823 MW developed today
- **BUT** Biomass (wood, etc.) resource is overused. Sustainable biomass use has been estimated to around 20 mio. ton/year, current consumption around 50 mio. ton/year. **Biomass use must be reduced**

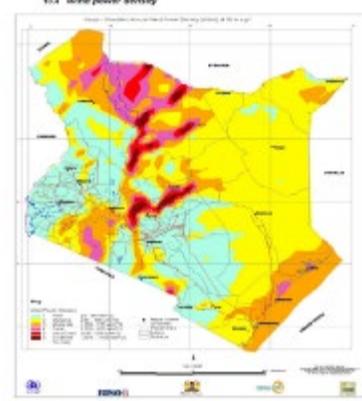


Figure 27. Map showing estimated annual wind power density at 10 m above ground



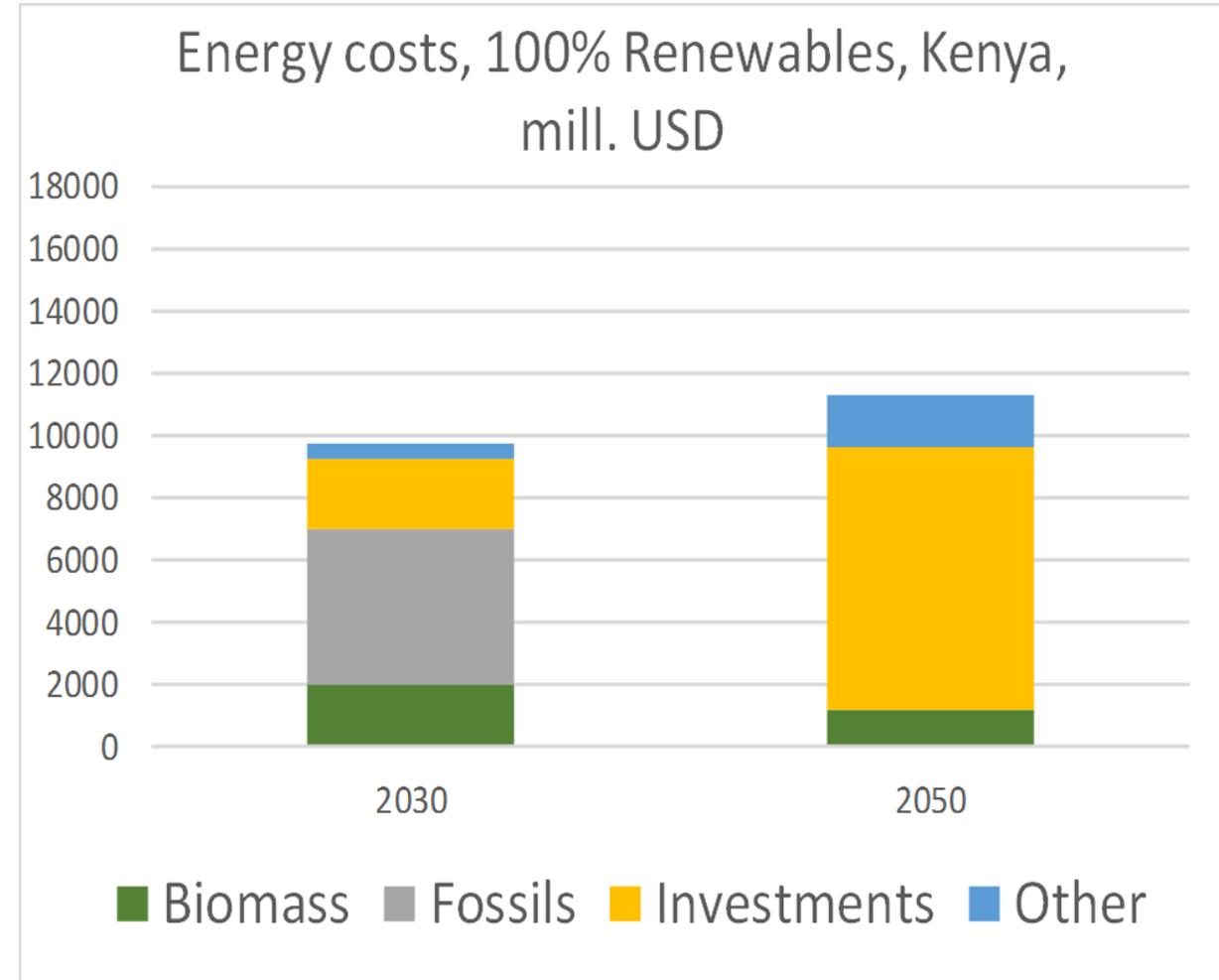
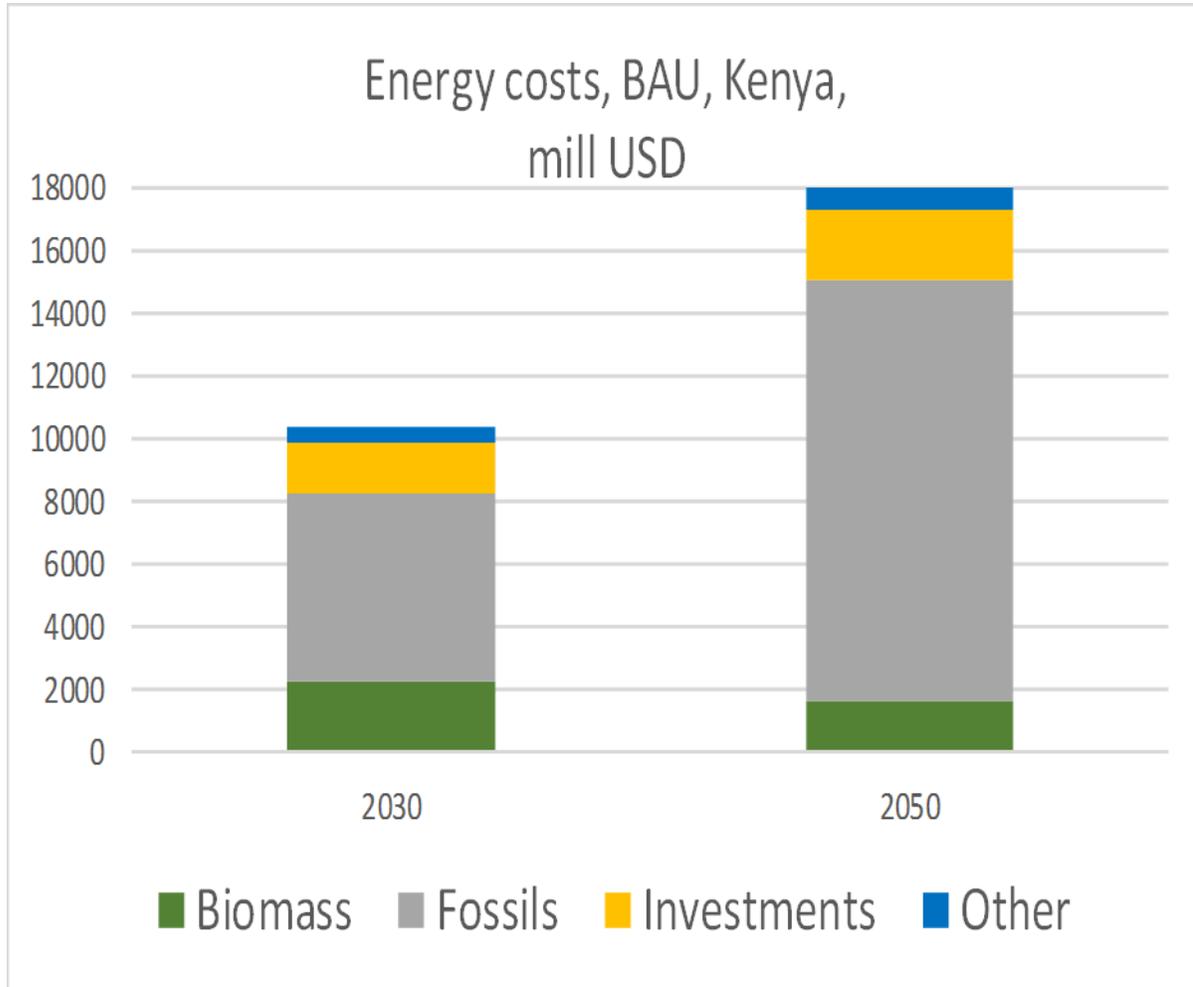
Proposal for a 100% Renewable Energy Development for Kenya

LAUNCH: Early August 2020

- Efficient cooking
- Change transport gradually to electricity, hydrogen and renewable fuels
- Make charcoal production much more efficient, from <15% today to 33%
- Expand windpower to 9,000 MW
- Expand solar power to 17,000 MW
- Expand geothermal power to 5,600 MW
- Expand electric interconnectors to 3,000 MW capacity
- Biomass power plants to balance demand and supply
- Our analysis shows that the 100% renewable alternative is cheaper than nuclear power and also the fossil fuel alternative with coal power.



BAU and 100% RE costs in 2030 and 2050



Thank you



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