

Responses to some frequent concerns over the proposed Lamu Coal Power Project

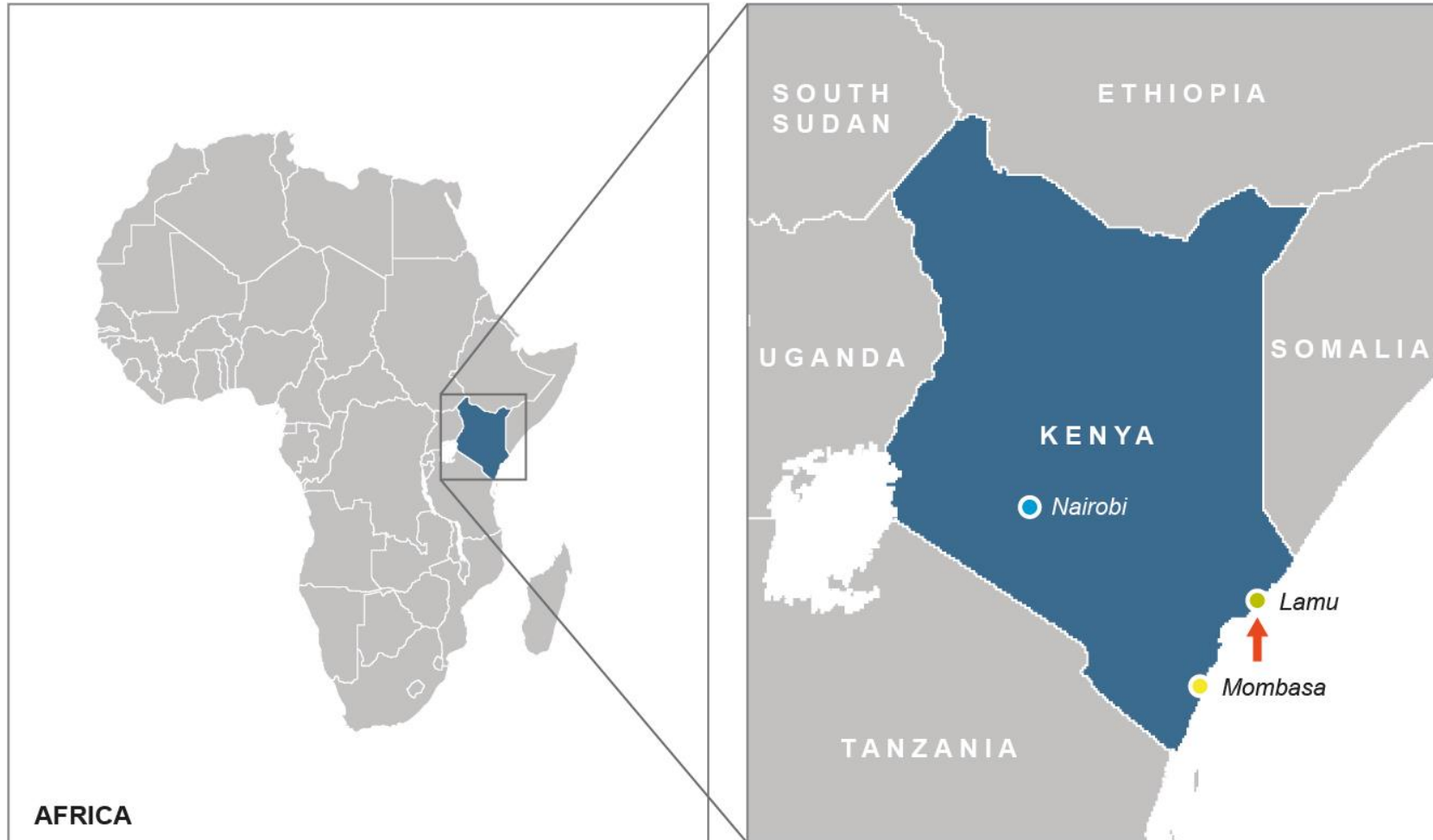
June 29 2019





1. Timeline and development of the Lamu Coal-fired Power Plant

- The proposed Plant is a 1,050 MW (3×350MW) coal fired plant with associated infrastructure located at Mukowe, Lamu County, Kenya.





1. Timeline and development of the Lamu Coal-fired Power Plant

- In September 2014, the development rights were awarded to a consortium of:
 - Gulf Energy;
 - Centum Investments;
 - Sichuan Electric Power Design and Consulting Company Limited (SEDC) - A subsidiary of Power Construction Corporation of China (PowerChina) and China Huadian (CHD).
- On June 8 2015, PowerChina signed the EPC Contract with Amu Power, a special purpose vehicle formed by the developers. On the same day, Industrial and Commercial Bank of China (ICBC) – proposed lender of the Project, signed a financing Termsheet with Amu Power.



1. Timeline and development of the Lamu Coal-fired Power Plant

- On May 16 2018, American conglomerate General Electric (GE) signed MOU with Amu Power to take 20% share of the Project and will join the development of an environmentally friendly and efficient coal power plant with GE's advanced coal power technology.
- ESIA of the Project was made by Kurrent Technologies Ltd and was first approved by NEMA on September 7 2016.
- On June 27 2019, the National Environment Tribunal has halted construction of the Project and required a fresh Environment Study with more public participation to be undertaken.
- EPC of the Project would cost around \$1-1.2 bn, and according to Amu Power, adding up financing and all other development costs, total investment of the project is around \$2 bn.
- Before the ruling, the Project was in suspension while Amu was working on equity fundraising.

2. What are roles of Chinese companies in this Project?



Amu Power - represented by Gulf Energy is the leading developer



PowerChina - proposed EPC Contractor;



China Huadian - proposed O&M contractor;



ICBC - proposed lender.



3. What is the attitude of Chinese companies towards the Project?

- An important infrastructure for the development of Kenya.
- A potential business opportunity for Chinese companies.
- The Project has not commenced till now, **and none of the Chinese companies has done any actual work for the project.**



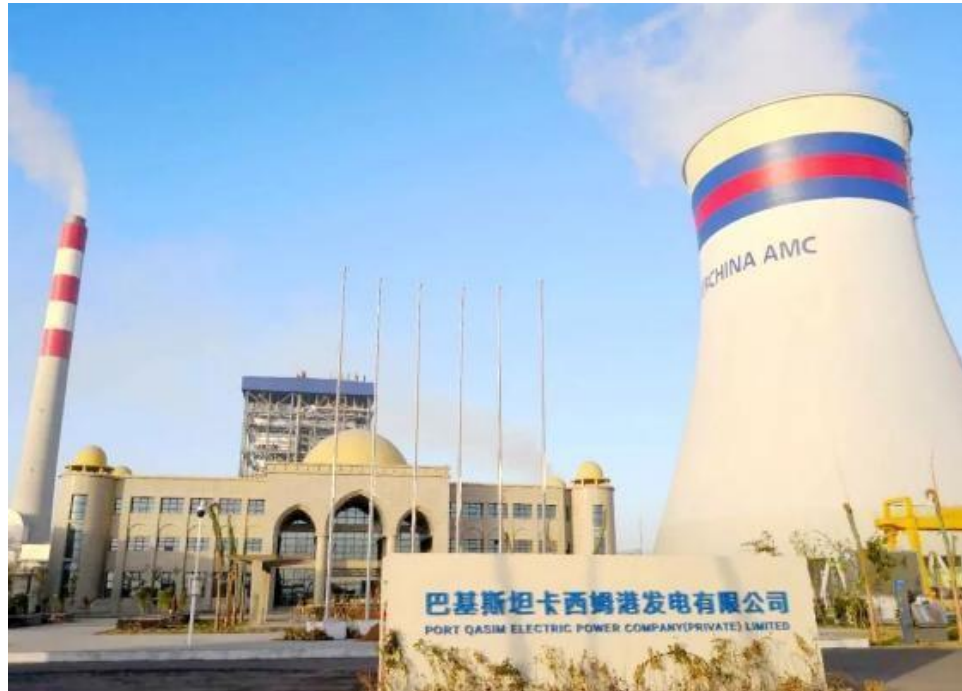
4. And are Chinese companies backing coal power in Kenya?

- Chinese companies are not backing coal power in Kenya out of their own interest.
- **Whether there is going to be a coal power plant or not?
GoK and the Kenyan people are the final decision makers!**
- Chinese companies would respect such decision whatsoever.



5. If the plant is going to be built, what is it going to be like?

One of **cleanest and most efficient** coal fired power plant in Africa with many advanced clean technologies to be deployed.

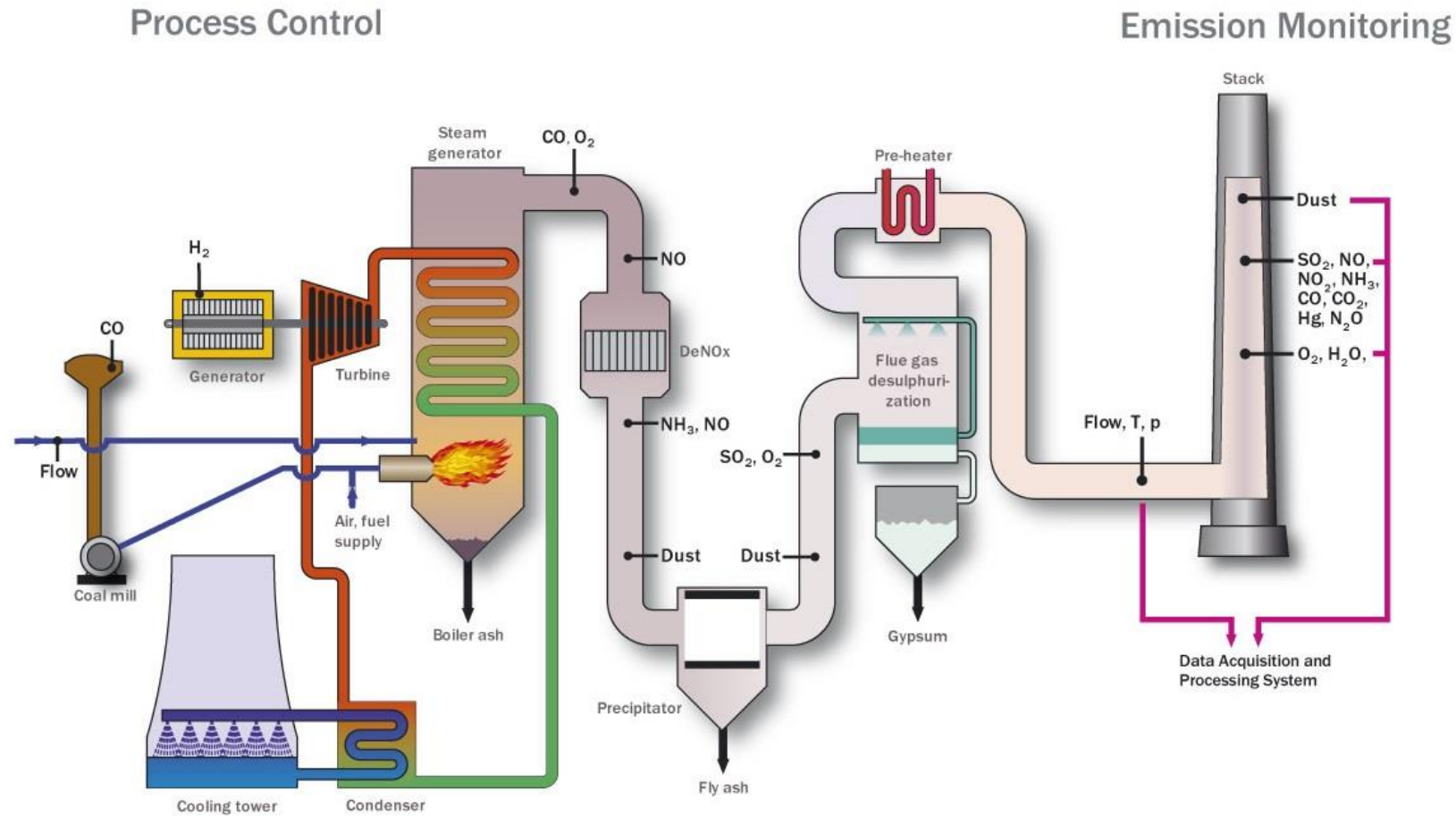


An example of Port Qasim Coal Power Plant in Pakistan



6. Is coal power as polluting as some media say?

Today's coal power is not as polluting as it is used to be.



According to United States' National Energy Technology Laboratory (NETL), coal-fired Power plants being built today emit 90 percent less pollutants (SO₂, NO_x, particulates and mercury) than their predecessors in the 1970s-1980s.



6. Is coal power as polluting as some media say?

Clean coal technology is a collection of technologies in attempts to lessen the negative environmental impact in the process of power generation from coal.

Fluidized-bed combustion

Integrated gasification combined cycle (IGCC)

Flue Gas Desulfurization

Low Nitrogen Oxide (NO_x)

Selective Catalytic Reduction (SCR)

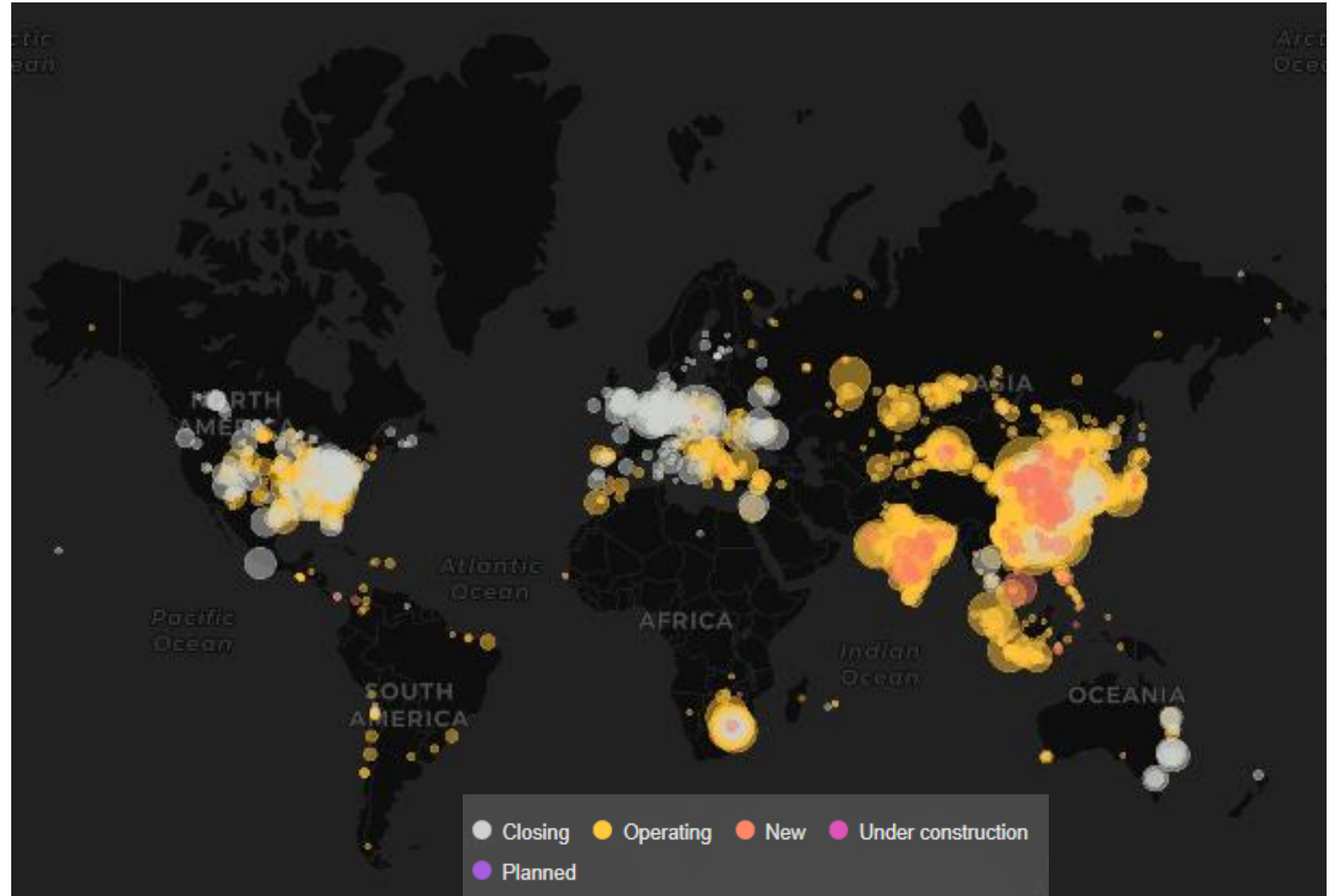
Electrostatic Precipitators

7. What is the development of coal power around the world and in major countries?



Since 2000 the world has doubled its coal-fired power capacity from 1,066GW to around 2,024GW. Besides, a further 236GW is being built and 336GW is planned.

There are now 78 countries using coal power.

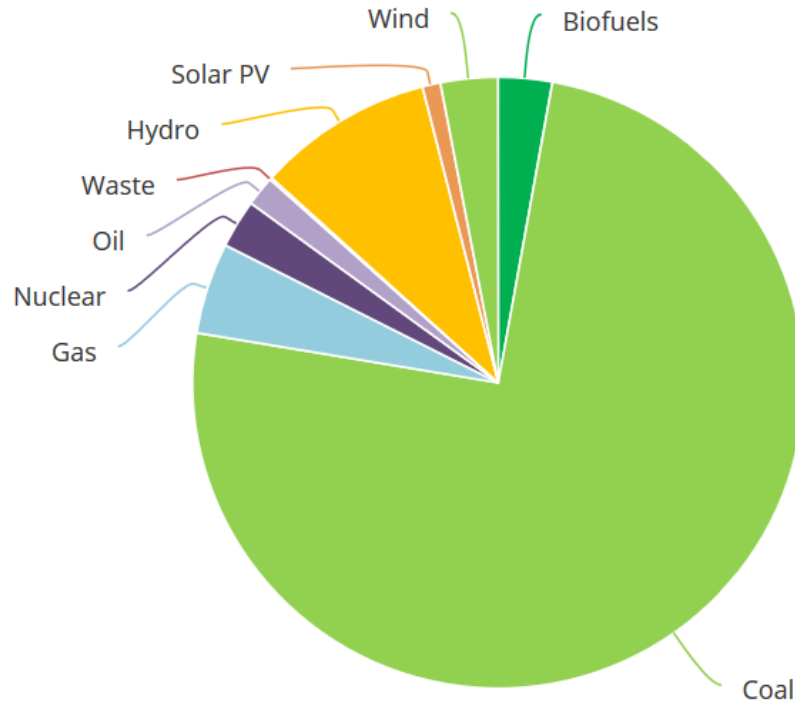


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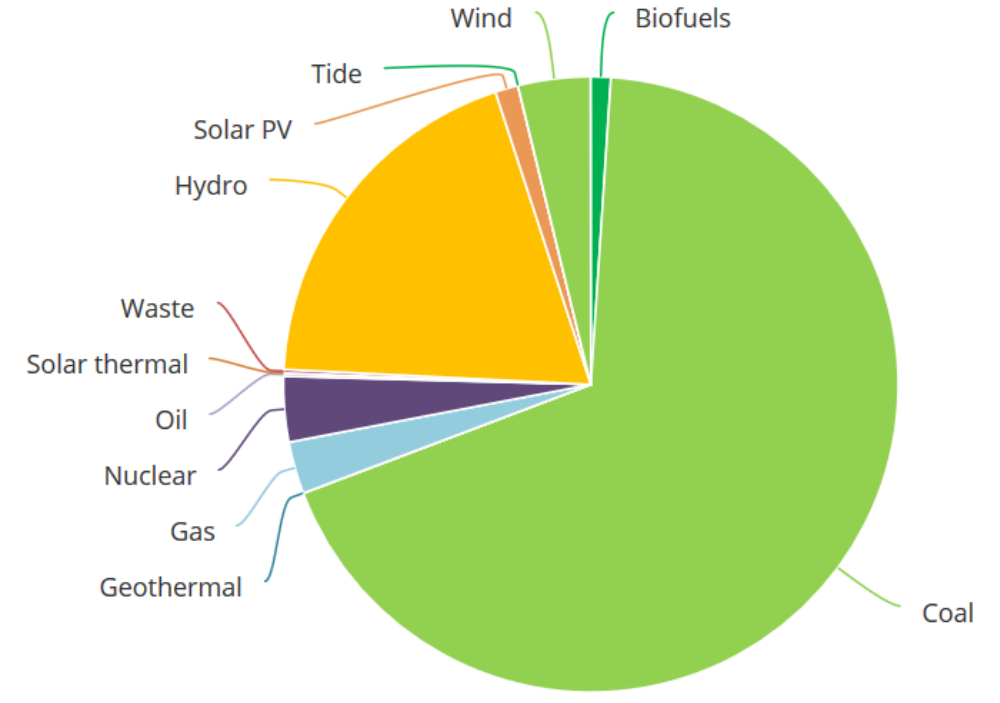
Share of electricity generation by fuel

India 2016



Share of electricity generation by fuel

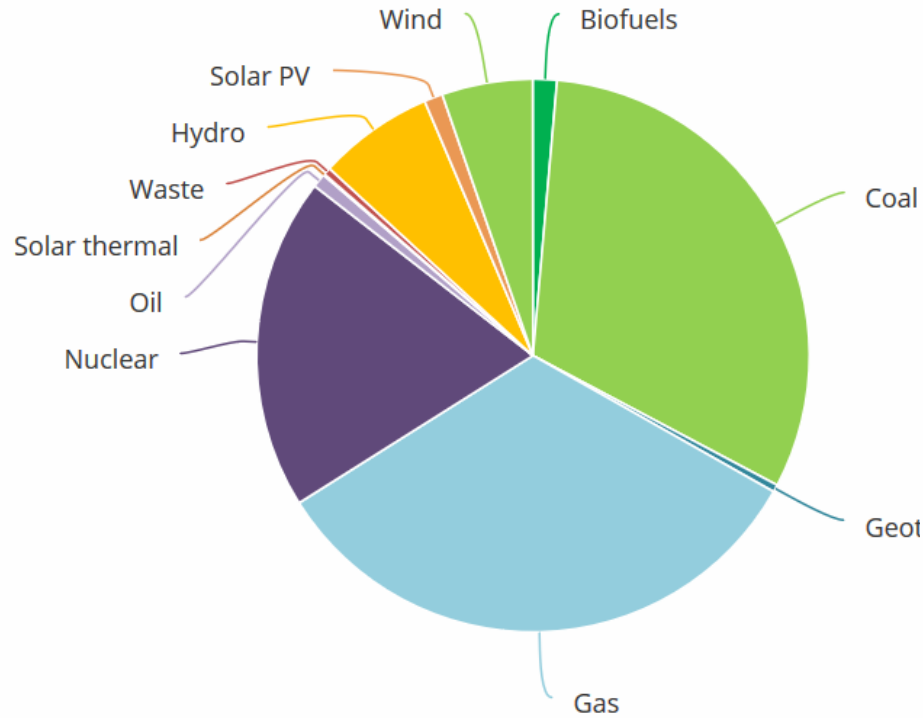
China, People's Republic of 2016



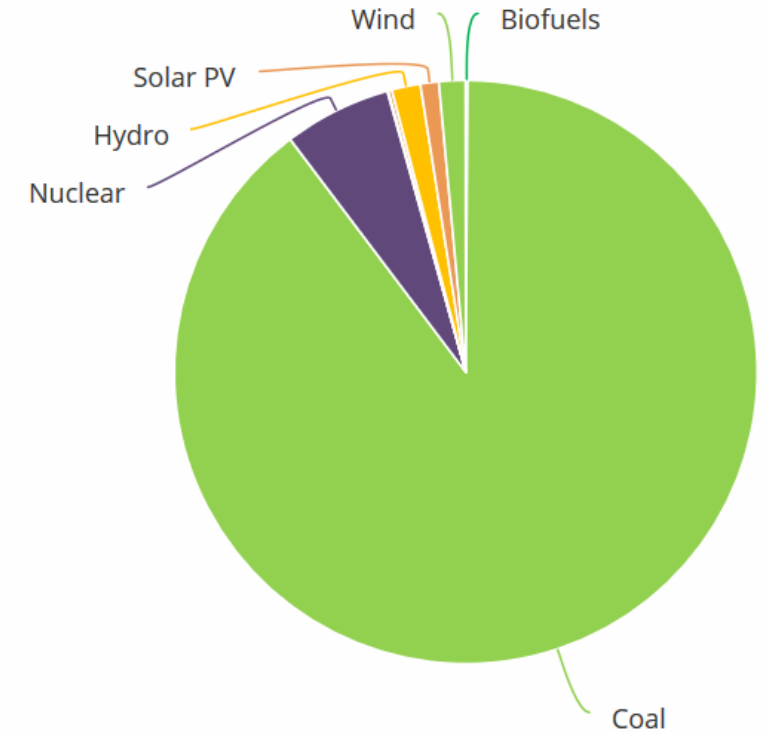
7. What is the development of coal power around the world and in major countries?



Share of electricity generation by fuel
United States 2016



Share of electricity generation by fuel
South Africa 2016



8. How much does the Project cost in reality? Is it true that some say the Project will cost 9bn USD?



“the project would cost consumers \$9 billion even if it does not generate any power”.

“Zuku is charging me Ksh 1.5 million even if I am not using its internet service”.

Compare with same standard

Same Amount of Electricity Power

- Unit Cost
- Life cycle Cost



Same Speed

- Daily Cost
- Monthly Cost
- Annual Cost



8. How much does the Project cost in reality? Is it true that some say the Project will cost 9bn USD?



“Kenya does not need that much power”.



Phase 1,



Phase 2,



Phase 3...

9. What are possible environmental impacts of the Lamu Project?



- Atmospheric impact
- Water impact
- Solid waste
- Noise pollution
- Possible social impact



10. And how these impacts will be mitigated?



Environmental Aspect	Protection Measures
Surface and Ground Water	<ul style="list-style-type: none">• The coal yard and ash yard design ensures that there is no seepage of runoff into the ground water or surface water.• Continuous monitoring is done with the use of groundwater monitoring wells to check water quality and ground water levels.• There will be an effluent treatment plant and monitoring system ensuring the effluent is compliant with Kenyan water quality regulations.
Thermal Effluent Discharge to the sea	<ul style="list-style-type: none">• The plant conforms to the World Bank and local thermal discharge regulations of $\pm 3^{\circ}\text{C}$ within a scientifically determined mixing zone.
NOx	<ul style="list-style-type: none">• The plant will utilize Low-NOx burners to minimize NOx emissions as well as a 210m chimney to ensure optimum dispersion and minimum ground-level NOx levels.
SOx	<ul style="list-style-type: none">• The plant will utilize a wet limestone Flue Gas Desulfurisation system that will extract the SOx from the flue gas, react it with limestone to produce gypsum.
Particulate Matter	<ul style="list-style-type: none">• The plant will utilize an Electrostatic Precipitator capable of removing up to 99% of particulates.
Ash	<ul style="list-style-type: none">• Ash produced during combustion will be collected and stored in a specially designed ash yard and will be reused in:<ul style="list-style-type: none">• Cement production as a substitute for clinker which the country currently imports and would therefore lower local cement production costs.• As a subbase material for road construction• Bottom ash can be used as a sand substitute in concrete



10. And how these impacts will be mitigated?

Standard	Particulate Matter	Sulfur Dioxide	NOx
EHS Guide Book for Thermal Power Plant from World Bank	50	200-850	510
Environmental Management and Coordination Regulations of Kenya	50	900-1500	510
<i>Lamu Coal-fired Power Plant</i>	<i>50</i>	<i>200</i>	<i>450</i>

10. And how these impacts will be mitigated?



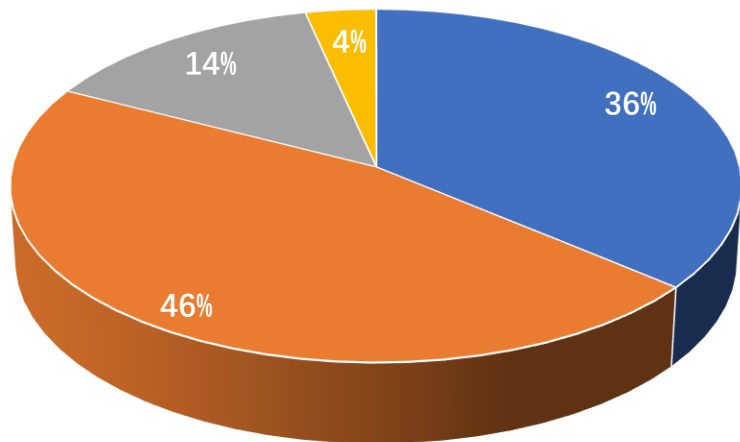
An example of Ledong Coal Power Plant in Sanya, Hainan China



11. Why a coal-fired power plant may benefit the development of Kenya?



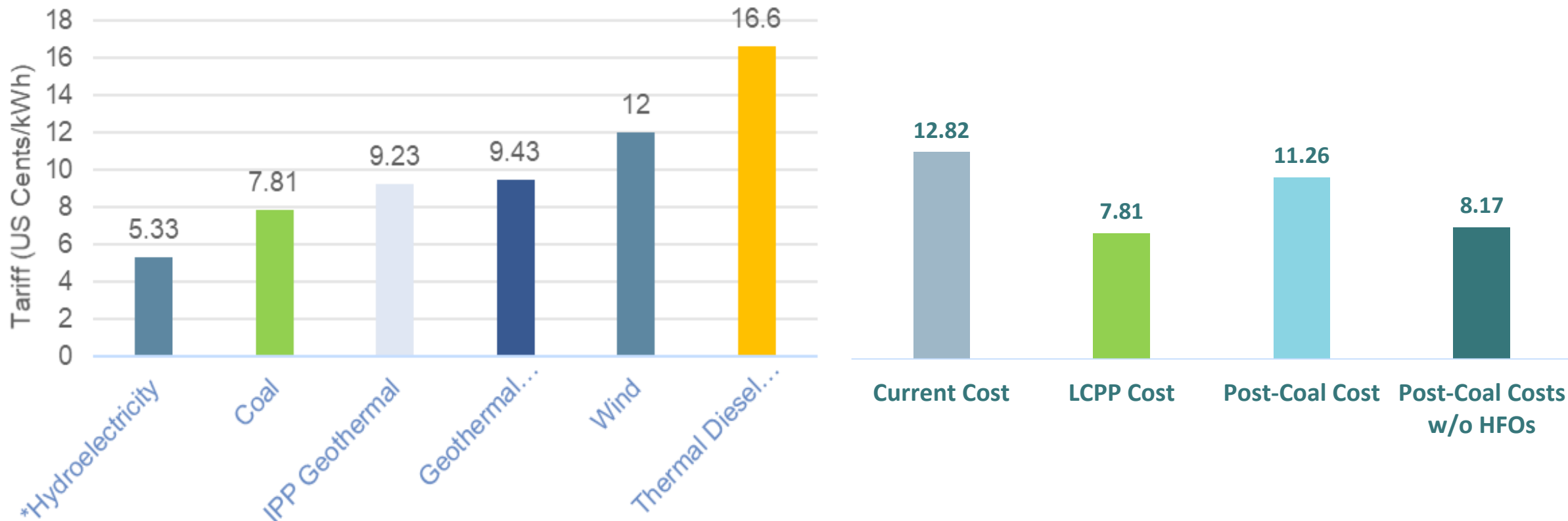
2018 ELECTRICITY GENERATION BY SOURCE
KENYA



■ Hydro ■ Geo - Thermal ■ Thermal ■ Wind

- Geothermal and Hydro production continue to be the major base-load contributors together providing 72.7% of energy in Q1-2019.
- Wind peaked in February at 16.6% of total production while averaging 15.5% for the quarter.
- Even though solar has historically had an almost negligible contribution to the energy mix, its contribution has risen steadily. Q1 saw solar nearing the 1% mark.
- The cost of Electricity goes as high as USC 21.6/kWh

11. Why a coal-fired power plant may benefit the development of Kenya?



Upon addition to grid, the Project will reduce power generation cost by 12.2%. If reliance on HFO power generators drops to 0%, cost of power will come down by 36%.

11. Why a coal-fired power plant may benefit the development of Kenya?



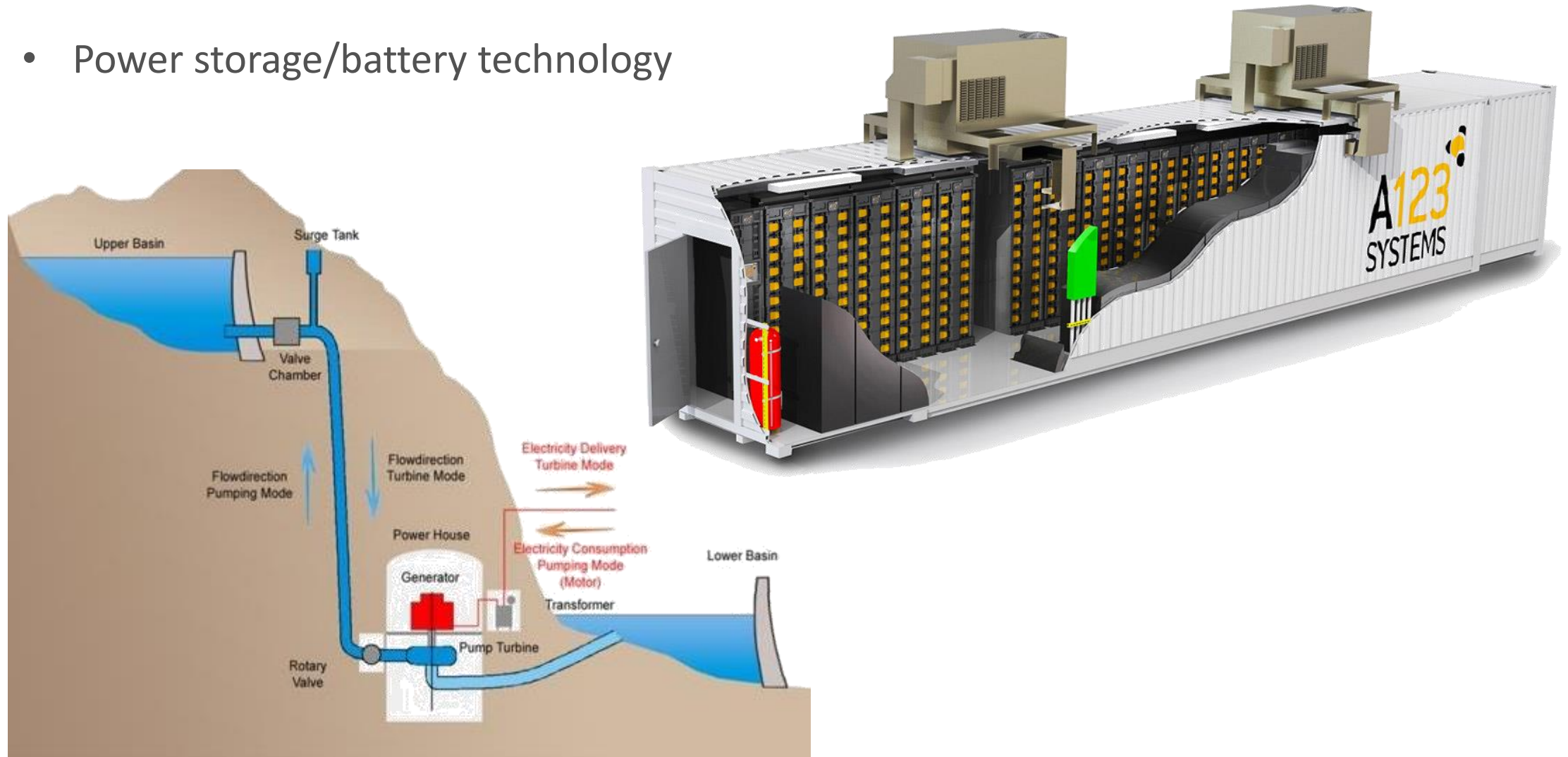
Power Generation required by BIG 4

Manufacturing	- Cotton Textile and Apparel: <i>21,000 tonnes of yarn per annum</i>	27.5MW
	- Leather processing: <i>20million pairs of shoes</i>	2.5MW
	- Iron ore to Steel production: <i>conversion of 17million MT of iron ore</i>	272.5MW
	- Fish processing: <i>10million tonnes</i>	480MW
Food Security	- Irrigation: <i>700,000 acres</i>	350MW
	- Rice processing: <i>rice yield of 406,486MT</i>	1.4MW
	- Maize milling: <i>6.030million tonnes</i>	93.1MW
	- Potatoes cold storage: <i>based on projected production of 2.52million MT</i>	35.5MW
	- Fertilizer production: <i>production of 90,000MT</i>	1.5MW
Housing & Urbanization	Urbanization of 1 million households *Household power consumption data compared to Colombia with similar profile and population as Kenya	143MW
Total Requirement		1,407MW

12. Why Kenya cannot fully rely on renewable energy?



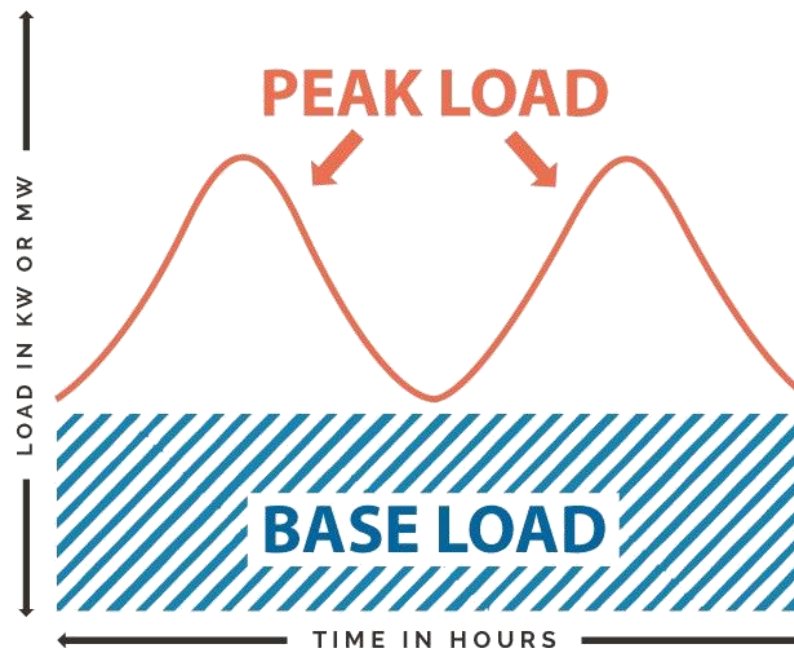
- Power storage/battery technology



12. Why Kenya cannot fully rely on renewable energy?



- Why solar and wind power alone cannot support a grid of big scale?
- What is Base Load?
- In Kenya, Geothermal and Hydro production continue to be the major base-load contributors together providing 72.7% of energy in Q1-2019.



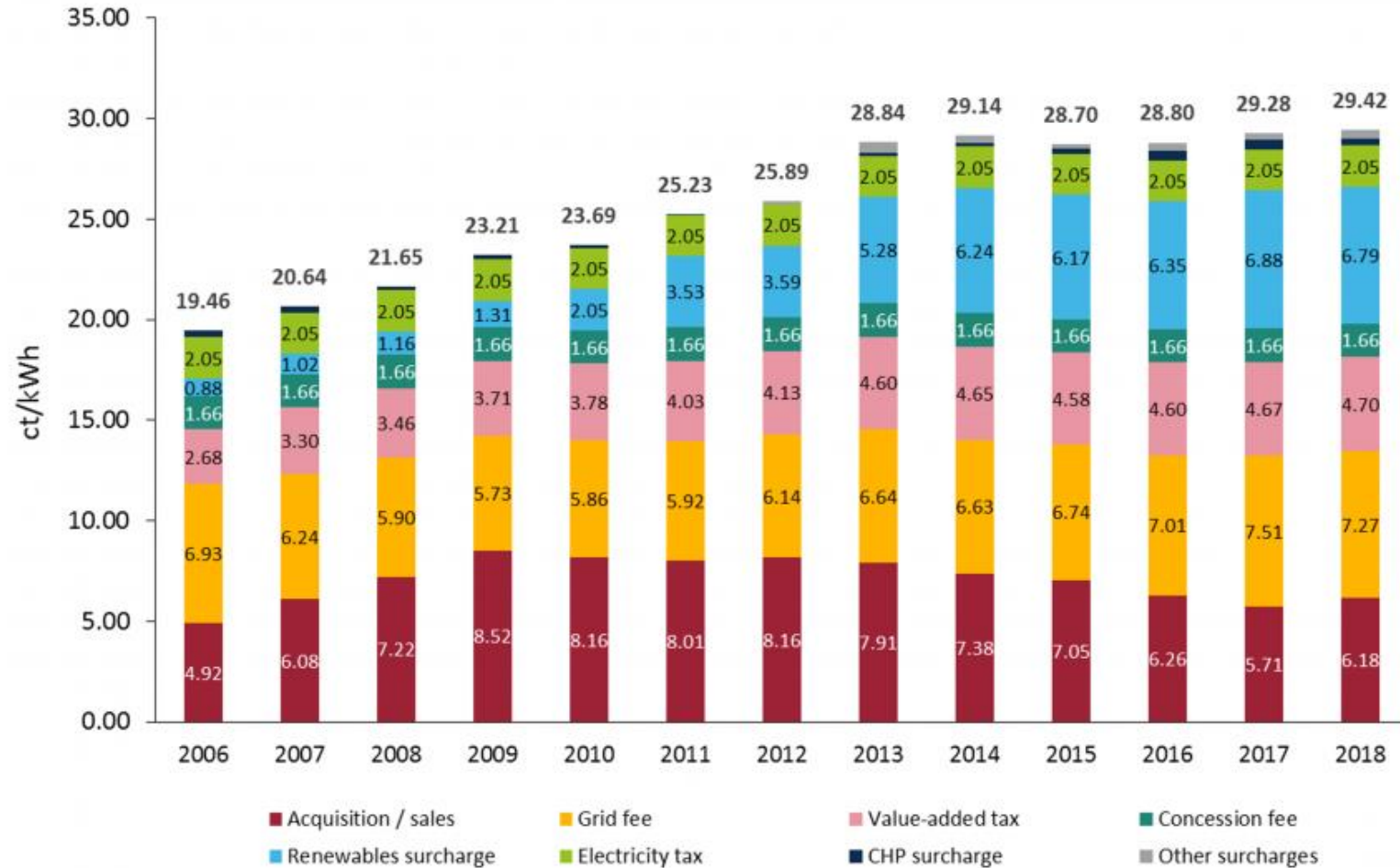


12. Why Kenya cannot fully rely on renewable energy?

Natural endowment of Kenya;

Difference of power demand between industrialized and industrializing country

-Composition of average power price for German household



It has been and always will be the people of Kenya who can decide whether there would be a coal power plant or not.

Thank you for your attention