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Global Energy Interconnection
Development and Cooperation Organization
全球能源互联网发展合作组织



GROUPE DE LA BANQUE AFRICAINE
DE DEVELOPPEMENT
AFRICAN DEVELOPMENT BANK GROUP

THE ENERGY TRANSITION: EXPECTATIONS AND REALITIES IN AFRICA

Research and Outlook on African Energy Interconnection

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Power System Transition in China

- 80% of hydropower is distributed in Southwest China
- 80% of wind power is distributed in West and North China
- 90% of solar power is distributed in West and North China
- 76% of coal is distributed in North and Northwest China
- More than 60% of electric power consumption is concentrated in East and Central China
- 17 UHVAC projects and 20 UHVDC projects, total length of 54,000 kilometers, commutated capacity reached 530 GW.
- By the end of 2022, China owns 7900 smart substations, 600 million smart meters, more than 5.41 million EV charging/battery swap facilities, with over 17.79 million registered users.

Grid development index	2025	2030	2050
Power Transmission trans-provincial (GW)	390	500	990
Share of clean energy installed capacity	58%	68%	92%
Share of electricity in final energy	30%	33%	57%



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Map of energy resource distribution and grid structure in China



Power System Transition in China



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- By the end of 2022, the installed capacity of **hydropower, wind power and solar power** in China stands at **414 GW, 365 GW and 393 GW** respectively, more than that of any other country in the world. **The percentage of the installed capacity of non-fossil fuels reaches 47%**, indicating constant optimization of the energy mix.



China's Three Gorges Hydropower project has the world's largest single-machine capacity and total installed capacity



The world's largest photovoltaic power base – Qinghai Taratan photovoltaic power station



China's first large-scale wind farm--- Dabancheng Wind Farm in Xinjiang



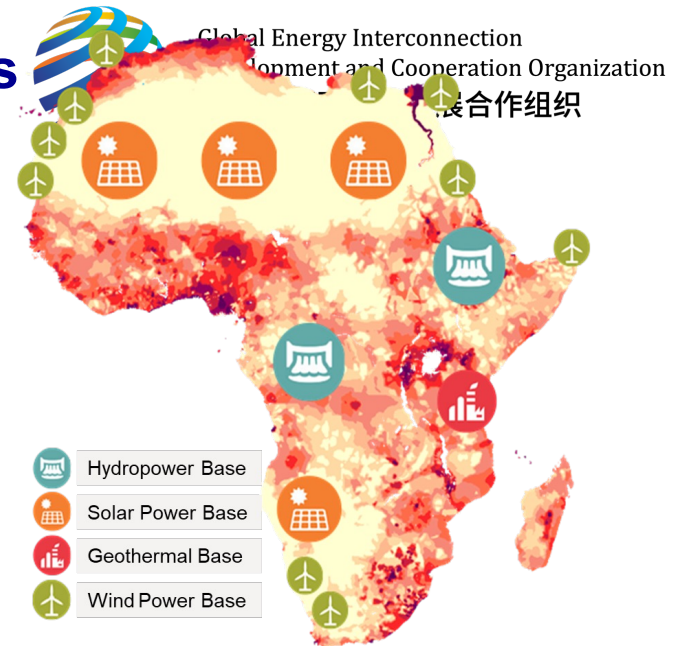
Xiangjiaba-Shanghai, the world's first UHV DC power transmission project



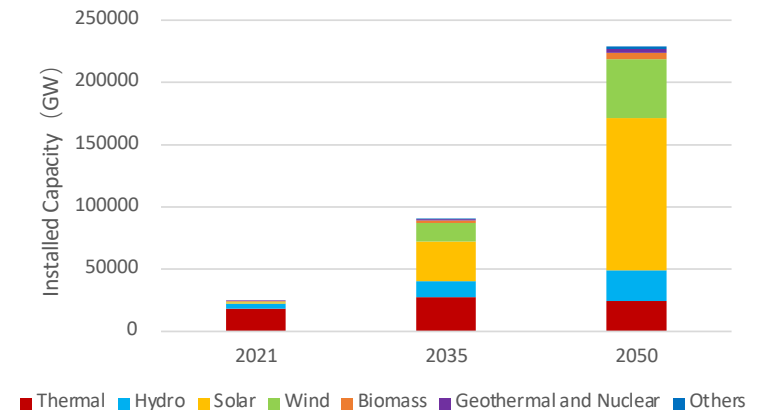
Development of African Clean Energy Resources

■ Develop large-scale, low-cost and highly efficient clean energy bases

- The gross theoretical hydropower potential in Africa account for **12%** of the world
- The technical installed capacity of hydropower is about **330 GW**
- Large hydropower bases can be built on the Congo River, the Nile River, the Niger River and the Zambezi River
- **Promote the co-development of electricity, mining, metallurgy, industry and trade**
- The theoretical gross potential of solar power in Africa accounts for **40%** of the world
- The technical development potential of solar power is **665 PWh/year**
- Large solar power bases could be built in the Sahara Desert and surrounding areas, the coastal areas of the Atlantic in southern Africa, and the inland areas in eastern Africa
- **Promote the electricity and hydrogen delivery from North Africa to Europe**
- The gross potential of wind power in Africa accounts for **32%** of the world total
- The technical development potential of wind power is **67 PWh/year**
- Large wind power bases can be built in the Sahara Desert and surrounding areas, the coastal areas of the Atlantic in southern Africa, and the inland areas in eastern Africa
- **Promote the coordinated development of hydro, wind and solar of central and east Africa to achieve multi-energy complementation**



Layout of Clean Energy Bases in Africa



Prospects of Installed Capacity in Africa



Overall Pattern of Africa Energy Interconnection

To build 3 synchronous grids in North Africa, Central and West Africa, as well as East and South Africa and to achieve cross-regional interconnection through UHV lines.

- **North Africa Synchronous Grid:** To lift the voltage to 1,000 kV; to build the 1,000 kV AC channel crossing the east-west to connect the large solar energy bases and load centers in North Africa; and to serve as an important energy allocation platform connecting Asia, Europe and Africa.
- **2 Synchronous Grids in Central and West Africa & East and South Africa:** To build strong 765/400 kV AC backbone grids within the region; to form a regional platform for optimal allocation of clean energy; electricity generated by large clean energy bases within the region will be transmitted and delivered by the EHV/UHV DC to major load centers.
- **Realize Europe-Asia Cross-continental Interconnection:** To build 3 power transmission channels across the western, central and eastern Mediterranean, so as to collect hydropower and solar energy from Central and North Africa and deliver them to Europe. To develop Africa-West Asia power interconnection channel to realize optimal allocation of clean energy on a large scale.

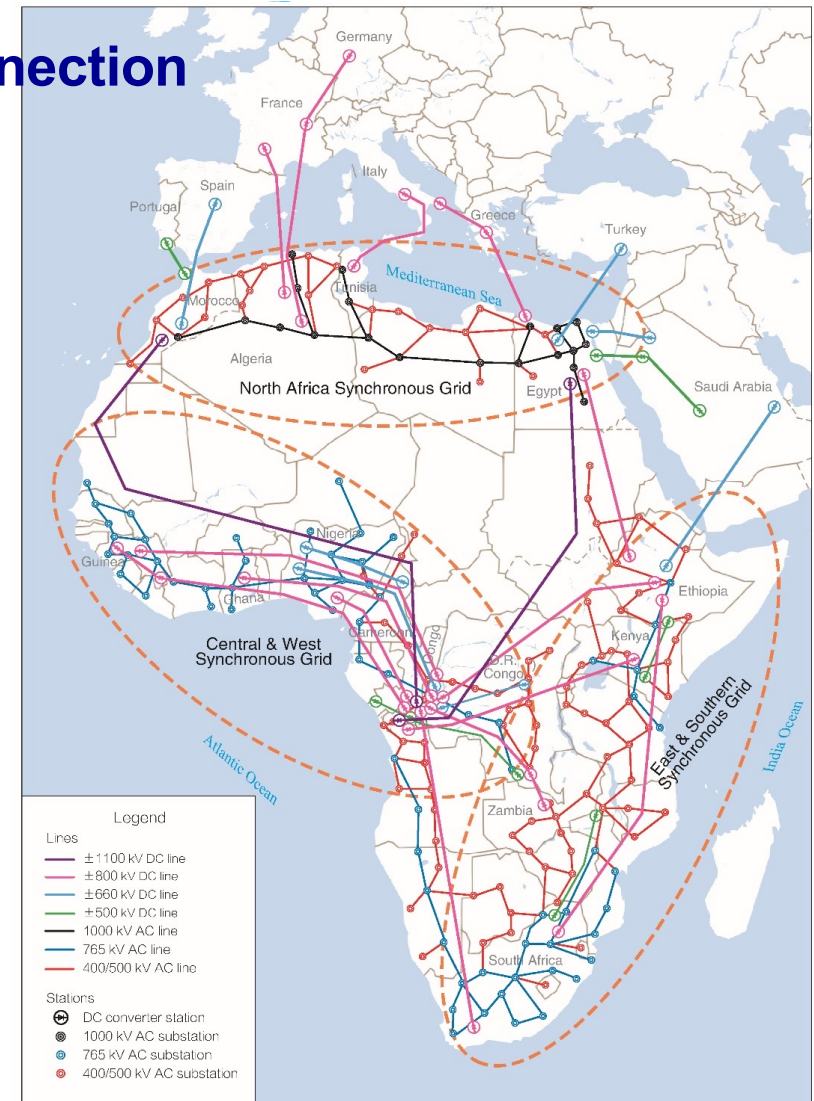


Illustration of Africa Energy Interconnection



Planning of Malawi Energy Interconnection

- **Both centralized and distributed development of clean energy resources**
- **Pre 2030** , Accelerate the utilization of distributed PV, strengthen the deployment of rooftop PV, to provide more people with access to electricity. Regarding large-scale development, focus on the development of the Dowa PV plant of 200MW close to the capital Lilongwe, which can complement the hydropower around the Malawi River and meet the electricity demand of the capital and surrounding areas. It is expected that the Dowa PV plant will reach an annual generation of about 360 GWh.
- **Post 2030** , Accelerate the utilization of various types of distributed PV, such as rooftop PV, BIPV and so on; Regarding large-scale development, it is proposed to develop large-scale PV plants in Karonga in the north and Zomba in the south, with an estimated installed capacity of 500 MW, and achieve power transmission through the north-south 400 kV transmission lines. The PV power will complement with hydropower along the coast of Lake Malawi. It is expected that the Karonga and Zomba PV plants will reach an annual power generation of about 1 TWh.



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Layout of Malawi's clean energy bases



Planning of Malawi Energy Interconnection



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■ Roadmap of Energy Interconnection Planning

Within Malawi, Accelerate the development and efficient utilization of hydropower, solar and wind power bases, build a 400 kV AC backbone network covering the whole country, form a strong 132 kV AC network, greatly improve the power supply capacity of the distribution network, meet the needs of rapid economic and social development, and solve the problems of poor people without access to electricity.

Cross-border wise, Take use of Malawi's outstanding location, resource and market advantages in southern Africa, strengthen interconnection with Mozambique, Zambia and other neighboring countries, and achieve multi-energy complementation.

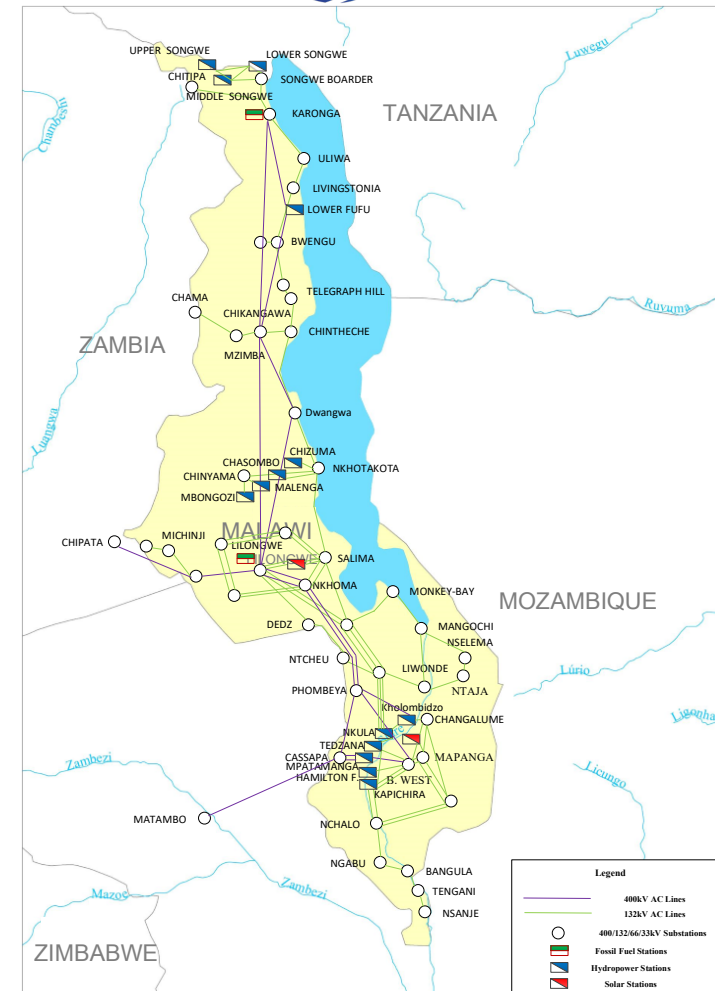


Illustration of Malawi Power Grid



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THANK YOU

**Now Let's welcome the CEO of CET
Mr. Jun Yu to share the CET's experience
and achievements in Africa.**

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