

推动全球能源转型，促进世界经济可持续发展

Pushing forward the Global Energy Transition,
Advancing Sustainable Development of the World Economy

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一、关于对世界能源转型趋势的认识

Understanding of the Trend of Global Energy Transition

(一) 全球能源生产和消费结构快速向以 低碳、清洁、高效 为特征的绿色可再生能源方向发展，呈现“两个替代”趋势

The structure of global energy production and consumption is steering in the direction of green and renewable energy, which features low-carbon, clean and efficient, presenting the trend of "Two Replacements".

1. 在供给侧逐步实现清洁能源对化石能源的替代，形成清洁能源为主、化石能源为辅的格局。

On supply side, replacing fossil fuels with clean energy is gradually being realized, forming the pattern of clean energy as the priority, supplemented by fossil fuels.



2. 在需求侧逐步实现电能对传统能源直接消费的替代。

On demand side, electricity replacement in conventional energy consumption is gradually being promoted.



(二) 水电一直是全球绿色可再生能源发展的首选路径

Hydropower has always been preferred in terms of global green and renewable energy development.

1. 水电开发技术成熟、运行灵活、综合效益显著，是目前技术最成熟、经济性最高、已开发规模最大的清洁能源，一直以来是全球绿色能源发展的首选路径。

With the advantages of mature technology, operating flexibility, and outstanding comprehensive benefits, hydropower has developed into the largest on the exploitation scale in clean energy, and highly preferred in global green and renewable energy development.

2. 整体来看，全球水电总体开发程度仍然不高，未来还有较大发展空间。非洲主要集中在刚果河、赞比西河等流域，理论装机容量约为580GW，目前仅开发了很少一部分，未来开发潜力巨大。

Taken as a whole, the exploitation level of hydropower is still relatively low, which has bigger space in the future. In Africa hydropower is mainly concentrated in the Congo River and the Zambezi River, the theoretical installed capacity of which is 580GW, with great potential to develop.



▲ 中国 三峡水电站 Three Gorges hydroelectric power station, China



▲ 非洲 刚果河 The Congo River, Africa

（三）新能源项目将成为未来全球电力市场的新热点

New energy projects will become a new hotspot in the future global power market.

1.全球风能资源非常丰富，世界风能资源理论蕴藏量每年约为20亿吉瓦·时（GW·h），其中非洲理论蕴藏量最大，每年约为6.5亿吉瓦·时（GW·h）。

Our globe is rich in wind power resources. The theoretical reserves of wind power resources are about 2 billion GW·h per year, of which Africa enjoys the largest - around 650 million GW·h.



▲ 埃塞俄比亚 阿达玛风电项目
Adama Wind Farm, Ethiopia

2.太阳能是世界上资源量最大、分布最为广泛的清洁能源，开发潜力巨大，其中非洲太阳能理论蕴藏量最大，每年约600亿吉瓦·时（GW·h）。

Solar power is the largest clean energy in regard to amount of resources and the most widely distributed in the world, with great potential of development. Africa's theoretical reserves of solar power are the largest - approximately 60 billion GW·h.



▲ 阿尔及利亚 光伏电站项目
Photovoltaic Power Station, Algeria

二、关于中国电建在非洲的实践

POWERCHINA's Practice in Africa

(一) 坚持“共商”原则，积极与相关国家和地区的发展战略对接，做非洲清洁低碳能源的提供者。

We act according to the principle of wide consultation, make efforts to be integrated with the development strategies of related countries and regions, and become a provider of clean and low-carbon energy in Africa.



➤ 埃塞俄比亚 Ethiopia

开展对当地风电和太阳能发电资源进行普查，通过研究规划，与当地政府沟通重点推动实施了阿达玛一、二期风电场EPC项目，带动了当地经济发展，优化了当地能源结构。

We conducted general surveys of wind power and solar power resources. Through research and planning, communicating with local government, we have implemented the Adama Wind Farm Phase I & II EPC Projects, which has driven economic development and optimized energy structure.



➤ 肯尼亚 Kenya

响应当地政府提出的“四大发展目标”战略，提出开发“抽水蓄能+新能源”构成未来骨干电源的科学建议。

Responding to the "Four Pillars of the Vision", put forward by the local government, we proposed advice of exploitation of "pumped storage + new energy" to compose the future core contents of power.



➤ 加纳 Ghana

提供符合当地实际需求的最佳融资方案，成功推动了加纳电力高速公路一揽子项目。

We provided the best financing plans which met the actual needs, and successfully pushed forward Ghana Power Transmission Package Projects.

(二) 坚持“共建”原则，以先进技术、优势产能和领先的商业模式助力非洲国家建设，做非洲经济社会发展的助推者。

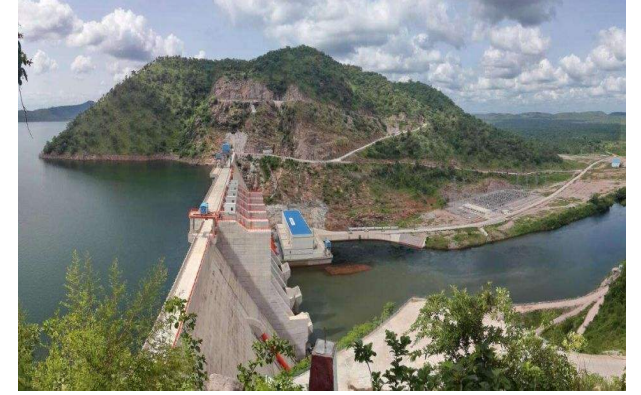
We follow the principle of joint contribution, support the construction of African countries with advanced technologies and competitive industrial capacity, and become a booster in social-economic development of Africa.



非洲最高大坝——埃塞俄比亚泰克泽水电站
The highest dam in Africa - Ethiopia Tekeze Dam



非洲最长大坝——苏丹麦洛维水电站
The longest dam in Africa -
Sudan Merowe Dam



非洲第一个大型混合贷款项目——加纳布维水电站
The 1st large mixed-loan project in Africa -
Ghana Bui Hydropower Station

非洲最大光伏项目——阿尔及利亚233MW光伏电站
The largest Photovoltaic project in Africa - Algeria 233 MW Photovoltaic Power Station



世界最大光热电站——摩洛哥努奥光热电站
The largest solar thermal power plant in the world -
Morocco Noor Solar Thermal Power Plant

(三) 坚持“共享”原则，授人以渔，融入非洲，做非洲经济社会责任的分担者。

We adhere to the principle of shared benefits, equip and enable local workforce, integrate into local community, and become a partner of economic and social developments in Africa.



中国电建在尼日利亚公益助学、爱心捐赠
Our Corporate Social Responsibility activities in Nigeria include education scholarships and fundraising for communities in need, etc.



中国电建为赞比亚免费培训实用型技能工人
In Zambia we provide free vocational trainings to local workers.

三、对非洲电力可持续发展的建议

Advice on the Sustainable Development of Africa's Power Industry

(一) 加强非洲清洁能源开发合作，应发挥“高端切入、规划先行”的引领作用。

To further strengthen cooperation in clean energy in Africa, we will continue to follow an approach as “master planning comes first”.

1. 加强沟通协商，与东道国紧密合作，开展清洁能源普查和复查。

Strengthen communication and consultations, work in close collaboration with host countries, and conduct general surveys and continuous evaluation of clean energy.

2. 充分考虑东道国的需求与意愿，与东道国双方合作编制能源电力合作规划，全面梳理能源电力合作的重点。

Take into full consideration of host countries' needs and wills, enhance bilateral cooperation of jointly compiling cooperative planning of energy and power, and identify the key points.



(二) 加强非洲清洁能源开发合作，应创新能源发展思路和商业模式。

To strengthen development cooperation of clean energy in Africa, we need innovate development ideas and business models.

1. 探索抽水蓄能+新能源、水电+新能源等多能互补的能源发展方式，以及大型能源基地+特高压输送、分布式能源+微电网等能源发展思路。

Explore "multi-energy-complement" development modes, such as pumped storage + new energy, hydropower + new energy, and energy development ideas such as large-scale energy base + UHV transmission, distributed energy resources + microgrid, etc.

2. 展开EPC、FEPC和投资等多种商业模式的合作，推动建立“政府+国际组织+能源企业+金融机构”的多方合作平台。

Develop various business forms of cooperation such as EPC, FEPC and investment, and establish a multi-party cooperation platform of "government + international organization + energy enterprise + financial institution".



(三) 加强非洲清洁能源开发合作，应重视区域电力互联互通和技术交流合作。

To strengthen development cooperation of clean energy in Africa, we should attach great importance to the connectivity of regional electric power grids and technical exchanges and cooperation.

1. 在非洲电网升级改造及建设方面加强合作，使非洲电源建设与电网建设协调发展，实现区域互联。

Strengthen cooperation in the upgrading and construction of African power grids to coordinate the development of power generation and power grid , and to achieve regional interconnection.

2. 在非洲加强本土化建设，加强与第三国企业合作，加大技术交流和人才培养力度，助力当地能力建设。

Strengthen localization in Africa, strengthen cooperation with third-country enterprises, promote technical exchanges and personnel training, and provide support in local capacity building.



在世界能源转型之际，中国电建将继续坚持“共商、共建、共享”原则，秉承“开放、绿色、廉洁”理念，朝着“高标准、惠民生、可持续”目标，以为非洲人民提供低碳、清洁、高效的可再生能源为己任，与非洲人民在内的所有利益相关方一道，共同积极应对气候变化、环境污染、资源匮乏、人口贫困等全球性议题，为建设绿色美好的家园，实现社会、经济的可持续发展做出更大贡献。

In a time of global energy transition, POWERCHINA will adhere to the principle of wide consultation, joint contribution and shared benefits, uphold the concept of "openness, greenness and integrity", and aim at "high standards, people-oriented, and sustainable development ". POWERCHINA is committed to providing low-carbon, clean and efficient renewable energy to African people. Together with all stakeholders, including the African people, we are actively coping with global issues such as climate change, environmental pollution, resource scarcity and population poverty. We are willing to make greater contributions to a green and harmonious earth, and the sustainable development of society and economy.



责任 创新 诚信 共赢
Responsibility innovation
Integrity and win-win

感谢您的聆听
Thank you!