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SYNOPSIS

China's Yarlung Zangbo (Tibetan name for the Brahmaputra River) Hydropower Project is a mega infrastructure endeavour to support ambitious green and technological development linking China with South and Southeast Asia. It will test regional diplomacy and governance.

COMMENTARY

Over the past year, China has made a striking shift in its infrastructure construction policy. In early 2024, to prevent local debt risks, the Chinese government required many of its cities to slow down, postpone or stop new large-scale infrastructure projects. However, by the end of 2024, it unexpectedly approved the Yarlung Zangbo River Hydropower Project (YZRHP), a large-scale undertaking with an investment value of over one trillion Yuan (US$139 billion). This enormous hydropower project consists of five cascade power stations, with a planned total installed capacity of 60 million kilowatts and an annual electricity output of up to 300 billion kilowatt-hour (kWh), three times that of the Three Gorges Dam.

The project officially began in July 2025. Chinese officials emphasised that the project was designed to serve China's goals of carbon peaking, carbon neutrality, and regional development. Against the backdrop of a broader shift toward more rational infrastructure investment, what explains this unexpected turnaround?

Diplomatic Value of the Project

Upon completion, the YZRHP will provide a massive supply of clean energy, which will create an opportunity for China to deepen its "clean energy diplomacy" with South Asian and Southeast Asian countries.

China's neighbours face problems with energy transitions and shortages. In India, electricity demand is rising, but delays in new coal and hydro projects lead to a 1.7 per cent shortfall during summer peaks. Vietnam plans to ban gasoline motorcycles in Hanoi by 2026, yet power shortages persist. In 2023, extreme heat and low hydropower production caused blackouts. China resumed electricity exports to Vietnam, now supplying 30 million kWh monthly via Guangxi, and is planning a long-term trading mechanism.

These trends highlight China's growing role in regional clean energy cooperation and its strategy to address both diplomatic and technological challenges through cross-border electricity connectivity. They also reflect China's willingness and ability to use clean energy to build a leadership role in the region.

Studies have shown that electricity is the lifeblood of the modern economy, and transnational power transmission networks are becoming an important driver of geopolitical cooperation. Based on China's mature ultra-high-voltage (UHV) transmission technology, the YZRHP has the potential to export clean electricity to South and Southeast Asian countries through the cross-border power grid of Yunnan and Guangxi in the future. This would help to alleviate power shortages in neighbouring countries and reduce their dependence on fossil energy, further promoting opportunities for Chinese investments in power and technological cooperation.

Once China takes the lead in building a regional power grid connecting South Asia and Southeast Asia, the neighbouring countries will form a certain degree of dependence on China's energy supply, thereby deepening economic ties and diplomatic relations.

The project will also become a platform for the convergence of China's energy diplomacy and environmental diplomacy. Chinese officials have repeatedly stressed that the YZRHP will be promoted under the banner of ecological protection. Chinese Premier Li Qiang described this as a "project of the century", and one that must prioritise ecological protection to avoid environmental damage. China promised not to intercept or excessively consume the river's water, and only to use the river's natural drop to generate electricity, thereby ensuring a reasonable flow downstream.

These assurances show that China hopes to make the YZRHP a model project for responsible infrastructure development, and to prove that large-scale hydropower development and ecological protection are not a zero-sum game, to eliminate the concerns of neighbouring countries about the environmental impact.

Energy Security and Technological Competition

The revival of the YZRHP is also closely related to the strategic competition between China and the United States. Entering the technological era driven by AI and computing power (PC), energy supply security has become the key foundation for rivalry among major powers. Ultra-large-scale AI model training, data centre operation, and advanced manufacturing all require massive electricity support. Relevant agencies have forecasted that China's data centre electricity consumption will exceed 1.01 billion kWh in 2030, 3.5 times higher than in 2022.

China is committed to strengthening its domestic clean energy capacity to ensure the development of emerging industries. The approval of the YZRHP at the end of 2024 has been recognised as a significant step in China's "Eastern Data, Western Computing" strategy; leveraging abundant hydropower resources in western China to meet the electricity demands of the digital economy in eastern China, thereby providing a reliable green energy foundation for the relevant industries.

China has vigorously built a computing infrastructure supported by new energy in recent years. The country's total power generation will reach about 10.1K terawatt-hour (TWh) in 2024, which is more than twice that generated by the United States. Electricity is the basic energy source for the operation of AI-PC, which determines the speed and scale of large models, algorithm training, and data processing, the key commanding heights in the competition between China and the United States in science and technology, economy, and national security.

Therefore, the power guarantee capability determines the confidence and strategic depth of major countries in the competition. In addition, the continuous supply of cheap electricity also provides confidence for China to expand supercomputing centres, develop electric vehicles and advanced manufacturing.

Transboundary Concerns and Regional Energy Governance

The YZRHP still faces many challenges in its implementation. The first is the sensitivity of cross-border water resources security. India and Bangladesh, the downstream countries, have always been wary of damming taking place upstream. Indian officials have expressed concerns that a dam, located only 50 kilometres from the China-India border, could cut 80 per cent of the water flowing into India, threatening irrigation and security in Indian territories such as Assam.

Despite China's pledge not to affect downstream flows, the trust deficit remains difficult to bridge. No water-sharing treaty over the Brahmaputra River has been signed among China, Bangladesh and India to date, and mechanisms for information exchange and emergency coordination remain underdeveloped. In practice, how China balances its hydropower generation with the need to release sufficient water downstream will become a thorny issue in regional diplomatic negotiations.

The coordination problem in regional energy governance cannot be underestimated. Building a transnational power grid and electricity trade system involves complex issues such as technical standards, price mechanisms, and sovereignty sensitivity. The maturity of the electricity markets in South Asian and Southeast Asian states varies greatly, and the regulations are different. These are institutional barriers to achieving a free cross-border flow of electricity.

For instance, India aims to lead the regional power grid and resists Chinese participation, promoting the "South Asia Regional Energy Partnership". This means that China's electricity exports to South Asia may encounter both geopolitical resistance and institutional barriers. In Southeast Asia, despite the Greater Mekong Subregion mechanism, countries remain cautious about relying on Chinese power, fearing energy dependence.

Under the ASEAN Power Grid framework, China also faces competition from Japan and Europe. Crucially, without concurrent upgrades to neighbouring countries' power infrastructure, China's ambition to export electricity from the Yarlung Zangbo River may be constrained by practical limitations in transmission capacity and regional integration readiness.

Downstream countries worry about safety and environmental risks, as the lower Yarlung Zangbo lies in an earthquake zone, with millions of people depending on the dam's stability. Environmental groups fear damage to the fragile "Grand Canyon" ecosystem. China's handling of resettlement, ecological flows, and biodiversity with basin countries will shape the project's international reputation and sustainability.

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