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**The Mekong's Energy Dilemma: Climate Pressure, Technological Shifts, and the Future of Hydropower | Zhang Hongzhou**

The energy crisis triggered by the war between the United States and Iran has laid bare the vulnerability of Southeast Asia to external fossil fuel disruptions. In the Mekong countries, including Thailand, Myanmar, Vietnam, Laos, and Cambodia, rising fuel prices and supply instability have intensified a long-standing dual energy dilemma.

First, the region faces a supply dilemma: chronic energy shortages persist despite increasing electricity demand whilst climate commitments require an end to fossil fuels. Second, it faces a clean energy dilemma: although the Mekong has substantial hydropower potential, expansion remains deeply contested because of the environmental, social, and geopolitical sensitivities surrounding the river's mainstream.

These challenges are now compounded by major technological shifts in recent years, namely the artificial intelligence (AI) revolution and rapid adoption of electric vehicles (EVs) across the region, both of which are driving further demand for electricity and, increasingly, for clean power. As a result, the Mekong's energy transition necessitates more than just increased capacity, it demands a fundamental reappraisal of hydropower's role in the region's future.

**Mekong's energy supply dilemma**

The Mekong's energy supply dilemma is a structural vulnerability rather than a transient price shock caused by the current Middle East conflict. Current policy frameworks of GMS member countries' already leave the region exposed to serious energy security risks. The region as a whole derived roughly 75% of its total primary energy from fossil fuels in 2017. This creates a chronic dilemma: while states must keep expanding supply simply to meet rising demand, the easiest way to do so depends on fossil fuels whose prices and availability they cannot control. This is further complicated by regional climate commitments, most notably the Net Zero targets of 2050 for Cambodia, Laos, and Vietnam, and 2065 for Thailand.

## The Mekong clean energy dilemma

While the first dilemma concerns securing enough energy, the second is about securing the right kind of energy. At first glance, hydropower presents a compelling solution. It is domestic, renewable on paper, dispatchable, and tradable across borders. In the Mekong, hydropower remains fundamental to the power system, and Laos in particular, has built an energy model heavily tied to hydro generation and electricity exports. But this is precisely where the clean energy dilemma becomes acute. The Mekong River Commission warns that hydropower development alters river ecosystems and disrupts fish migration, potentially jeopardising the food security and livelihoods of millions. For instance, it is suggested that existing and proposed dams in the basin are expected to have major cumulative effects on sediment flows into the Mekong Delta.

## AI and EV adoption

This supply strain is set to intensify as electricity demand scales alongside rapid economic growth and major technological shifts. In particular, the spread of AI is fueling a regional boom in data centre construction, supported by expanding internet penetration, digitalisation, and accelerating cloud adoption. Vietnam illustrates the scale of this challenge as seen by the rapid acceleration of data centre investment. Similarly, Amazon Web Services, Google, Microsoft, TikTok, and others have committed billions of dollars to the construction of data centres in Thailand. Significantly, many of these firms have pledged to power their facilities with renewable energy, further increasing pressure not simply for more electricity, but for more clean electricity.

At the same time, the Mekong subregion is emerging as a major growth market for EVs. According to the International Energy Agency, electric car sales in Southeast Asia rose by nearly 50% in 2024 — accounting for 9% of total sales — with Vietnam and Thailand reaching 17% and 13% respectively. This transition extends beyond passenger cars to electric two-wheelers, which are central to urban mobility in mainland Southeast Asia. In Vietnam where there are roughly 77 million registered motorcycles, Hanoi's plans to ban fossil-fuel motorcycles from its city centre from July 2026, with Ho Chi Minh City considering similar restrictions, could significantly accelerate electricity demand in the transport sector.

These developments are reshaping the region's energy outlook. The combination of digital infrastructure expansion, AI-driven computing demand, and transport electrification is creating a steep and sustained increase in electricity consumption. For instance, Vietnam is expected to see strong growth in power demand over the next decade, with the government predicting an increase in electricity demand of 10 to 12% by 2030, the fastest rate in the region.

## The Future of the Mekong Energy Transition and Hydropower

Together, these trends are driving an unprecedented surge in regional energy demand, especially for clean energy. Expanded investment in clean energy, particularly betterdesigned hydropower projects, is increasingly seen as necessary to meet rising electricity demand while contributing to climate goals. This logic is understandable. In the Mekong context, hydropower retains significant advantages over wind and solar: it offers higher capacity factors, dispatchable generation, and, in some cases, storage across seasons, making it valuable for both baseload supply and peak demand management. For governments under pressure to deliver reliable electricity, sustain economic growth, and reduce fossil fuel dependence, hydropower remains an attractive option, albeit a source of environmental and political tension. Consequently, the real challenge is not whether hydropower has a role in the Mekong's future, but how to redefine its role in a transition that is low-carbon, socially sustainable, and geopolitically stable.

**About the Author**

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