

Laos microgrid operation

Renewable power generation is slowly gaining traction in the Lao People's Democratic Republic (Laos). However, the country of only 8 million people doesn't receive as much attention as its larger and more powerful fellow Association of Southeast Asian Nations (ASEAN) members, particularly Indonesia, Thailand, Vietnam and the Philippines.

Laos is pursuing economic growth, aiming to raise itself from its least developed country (LDC) status to a lower middle-income country through poverty reduction and sustainability. However, its debt levels remain problematic, at USD 13.8 billion, around 108% of its gross domestic product (GDP).

In its submission to the UN in May 2021, Laos said it aimed to achieve net-zero emissions target by 2050 and reduce emissions by 60% from business as usual by 2030 - around 62 million tonnes of CO₂.

The country has set a target for its power sector to reach 30% renewable energy. It has also set a conditional target of 1 gigawatt (GW) of total solar and wind capacity and 300 megawatts (MW) of biopower capacity by 2030, depending on the support it receives from developed countries.

Laos holds a unique place in the region. It is often referred to as 'the battery of Southeast Asia' since it exports much of its electricity to neighbouring Thailand, China, Myanmar, Vietnam and Cambodia. Laos also exports smaller amounts of electricity to Singapore using existing interconnections from Thailand and Malaysia.

However, Laos generally suffers from energy instability because most of its power plants are owned by international businesses and generate electricity for export. It even has two electricity grids, one for exporting power and one for domestic usage.

Laos relies on hydropower and lignite (brown coal) for most of its power generation, making up 83% and 16% of the mix, respectively. However, by the end of last year, only eight solar power projects and four biomass power plants were in operation, with an installed generation capacity of 116 MW, representing just 1% of the country's total electricity production. As of early 2023, Laos produced power from 76 hydropower dams, with another 43 still under construction.

At first glance, it would appear that Laos' overreliance on hydropower would be beneficial in terms of energy independence and a negligible carbon footprint, but challenges remain.

On the one hand, hydropower is considered a clean energy source. Yet, all inland waters naturally produce some greenhouse gas emissions, while human-made reservoirs constructed for hydropower facilities change how carbon is emitted and stored in river systems, sequestering some carbon.

Hydropower plants also release embedded carbon in the form of methane emissions. Hydropower development can also increase drought and sediment blockage and negatively impact a hydro-reliant regional grid system.

Laos has also set targets for increased coal production and exports until at least the decade's end. As of June 2024, it had 5.4 GW of coal capacity under development. The government claims it has to develop more coal-fired power generation to meet rising electricity demand.

However, a renewed emphasis on more coal production sends a mixed message about the country's commitment to decarbonisation and fight against climate change. It contradicts the regional push toward more solar and wind power in the Lower Mekong Basin.

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