EVN has invested $397.92m in expanding the Hoa Binh Hydropower Plant.

Droughts and regulatory mayhem taint hydropower development on Mekong waters

Projects are still getting greenlighted as Mekong River nations struggle to meet climbing power demand, but concerns on their environmental, social, and economic effects are also mounting.

Whilst the Mekong River has always been a key power resource for the countries that it runs through, governments and utilities are becoming more cautious in developing projects on the river. At the heels of continuous development, there are threats of drought, depletion of river biodiversity, as well as local and cross-border tensions between governments and their constituents.

One of the countries along the Mekong, Vietnam, is being held back from its goal to raise hydropower capacity by depleting water levels, as data showed that its large reservoirs have only accumulated 61% of total volume capacity. Low water levels resulting from climate change may also create a deficiency of 6.4 billion kWh, according to EVN.

Amidst drought issues, hydropower remains vital to Vietnam's energy security, so the country continued to bolster this sector with some of the largest power projects in 2019. EVN invested $397.92m (VND9.22t) into the expansion of Hoa Binh Hydropower Plant in order to increase capacity. It has also invested $276.21m (VND6.4t) into the expansion of Ialy Hydropower Plant, which is scheduled to break ground a year after the expansion of the Hoa Binh plant.

Power plants that have been issued with power generation license and have a capacity larger than 30MW must register and directly participate in the VWEM.

Vietnam's mini-hydro push

After 2019, Vietnam will cease to have large-scale projects in its pipeline as it has already deployed those with over 100MW capacity. As a result, the attention of Vietnam's developers is now focused on small-scale projects, said **Dang Chi Lieu**, partner at Baker McKenzie Vietnam.

By far, up to 138 small-scaled projects are being constructed and 299 projects in investment study phases, according to data from the Ministry of Industry and Trade (MOIT).

The government is promoting small-scale hydro by placing new law amendments geared towards incentivising their development. It eyes limiting the project size that can be covered by the EVN's obligation to purchase generated electricity through an expandable 20-year PPA, ratified through its Avoided Cost Tariffs (ACT). With the new mechanism, ACT is only applied to renewable energy projects with capacities no larger than 30MW.

Limits on the ACT mechanism were imposed to improve consistency in the regulations for the Vietnam Wholesale Electricity Market (VWEM), Dang explained. "Particularly, according to Circular No. 45/2018/TT-BCT, power plants that have been issued with power generation license and have the capacity of larger than 30MW must register and directly participate in the VWEM. Hence, according to the new proposed limits, plants which are participating in the VWEM shall not be eligible for ACT mechanism," he said.

This new regulation provides incentives to small-scaled hydropower plants in their early stages. It also requires such plants to participate in accordance with market standards if and when they expand their capacity, he added."

For a cluster of cascade hydropower plants for which their ACT PPAs are signed before 1 January 2020, the power developer (seller) may continue the signed ACT PPAs, Dang said. "The impact of the new regulation therefore depends on

East Asia and Pacific hydropower capacity

Rank	Country	Total installed capacity	Rank	Country	Total installed capacity
1	China	352,260	13	Philippines	4,314
2	Japan	49,905	14	Myanmar	3,331
3	Vietnam	16,679	15	Cambodia	1,667
4	Australia	8,790	16	Papua New Guinea	234
5	South Korea	6,490	17	Fiji	125
6	Malaysia	6,094	18	New Caledonia	78
7	Indonesia	5,511	19	French Polynesia	47
8	New Zealand	5,346	20	Mongolia	23
9	Laos	5,308	21	Samoa	12
10	North Korea	5,010			
11	Chinese Taipei	4,691			
12	Thailand	4,510			

* including pumped storage

Source: International Hydropower Association 2019 Hydropower Status Report

whether the project has signed the PPA or not," Dang advised.

But over 470 small-scaled hydropower projects have also been proposed for removal as provincial people's committees review the pipeline under the eighth Power Development Plan in Vietnam. "The MOIT inspects the investor's compliance in dam safety, replacement forestation, environmental service fee payment, water reservoir operation process and other requirements on licenses (water surface exploitation, power generation)," Dang added.

Tensions in Lower Mekong

With some of the world's most important rivers strewn across its landscape, Cambodia is one of the countries that is best placed to use hydropower as a stable source of electricity. But data from the International Hydropower Association (IHA) revealed that the Kingdom has only tapped into 20% of the resource's technical potential.

The presence of 63 possible sites for small and large projects throughout the country, coupled with rapidly rising electrification rates, has pushed Cambodia to support some of its most ambitious hydropower projects to date. Its 400MW Lower Sesan II project, commissioned in 2018, will boost electricity production by 20% with the power being sold to Electricité du Cambodge (EDC) at a base price of 0.0695 cents per kWh.

Getting this ambitious project across required collaboration with cross-border developers. The Lower Sesan II project is a joint venture between China's Hydrolancang International Energy (holding a 51% stake), Cambodia's Royal Group (39% stake), and Vietnam's EVN International Joint Stock Company (10% stake).

This pattern of cross-border collaborations appears across several other hydropower projects. In fact, with the Lower Sesan II entering into operation, Chinese-built hydropower projects in Cambodia have an installed capacity of over 1,300MW and account for half of the country's total installed capacity from all energy sources.

But cross-border collaboration for the ambitious hydropower projects across Mekong River countries is fraught with tensions. A Fitch Solutions report pointed out that government pushbacks in the upstream countries could intensify for some projects.

The negative public sentiment towards Cambodia, after the collapse of the Xe-Pian Xe-Namnoy dam in 2018 that killed about 71 people and displaced 25,000, could prompt government to view Laotian hydropower construction like the planned Luang Prabang Hydropower Project less sympathetically and heighten the risk of inter-state tensions in 2020, Fitch Solutions said.

Concerns over Cambodia's reliance on Chinese developers' support for its hydropower projects have also stained local sentiment, highlighted by the government's move to keep a report on the Sambor hydropower dam under wraps as the period for local elections approached. The report, made by the US-based National Heritage Institute (HNI) and commissioned by the Cambodian government, argued that the Sambor hydropower dam "is probably the largest and most destructive dam in the Mekong River basin." It argues that further development could destroy migratory fish reproduction in the site.

Even with controversies in its midst, IHA noted that the government views the Sambor dam as an opportunity to generate revenue through exporting its electricity to neighbouring countries, including Vietnam and Thailand where regional interconnectors are already in operation. But with environmental and social concerns on its path, a final decision on its future is still to be made.

Apart from Cambodia, Myanmar also made strides in sizing up its hydropower sector. After some delay, the government issued a notice to proceed for both the 1,050MW Shweli 3 and the 60MW Deeoke projects. Shweli 3 in Shan State is considered to be a priority project in order to meet the energy needs of the country over the medium term and will be developed by a consortium led by French utility firm EDF.

Several notices to proceed [in Myanmar] were signed by the government and sponsors with respect to hydropower projects over the past few years.

IHA noted that the International Finance Corporation also released a Strategic Environmental Assessment (SEA) of Myanmar's hydropower sector, the culmination of a two-year process, which is seeking to help guide sustainable hydropower development with a strong focus on the need for basin-level planning.

Over the past few years, tax advisory firm VDB Loi's counsel **Maxim Kobzev** observed the attraction towards Myanmar's renewables sector. In a note, he said, "renewables projects have a broader potential lender group, as more and more international lenders shift and prioritise green finance, whilst reducing or completely excluding from their portfolio transactions that relate to fossil fuels. Myanmar is a great illustration of this, as several notices to proceed were signed by the government and sponsors with respect to hydropower projects over the past few years."

The potential of hydropower also remains unavoidable for Lao PDR, as according to the Mekong River Commission, the country obtains practically all its supply from hydropower in the Lower Mekong Basin.

According to VDB Loi senior counsel **Sornpheth Douangdy**, development financiers such as Asian Development Bank and World Bank, as well as Belt and Road financiers, also play a big role on the lender side in Laos.

"As for sponsors, Lao Holding State Enterprise, Électricité du Laos, and Generation Public Company are the three entities representing the state's investment in the power sector and are the major players in this sector. A number of hydropower plants, particularly small and medium-sized hydropower plants, are developed by companies that are owned by Lao nationals and businesses," he said.

The country commissioned a further 254MW in capacity in 2019, but the sector experienced a very difficult year due to the collapse of Xe-Pian Xe-Nam's saddle dam in July 2018. "Following the collapse, the Laotian government announced an investigation into its causes, a review of all existing and under-construction dams and a halt to proposed projects. The government also established a centre for dam safety management in order to prevent such incidents occurring in the future," IHA said.