

## Small-scale hydropower in ASEAN countries: what contribution to a greener energy mix?

Amidst the buzz generated by large-scale energy investments and projects, small-scale hydropower plants represent a tremendous opportunity for the ASEAN countries to boost their electrification rates and bring energy to their rural communities. Ideal for archipelago nations like the Philippines or Indonesia, small hydro is more easily accepted by local communities and equally suited for off-grid applications in remote rural areas abundant with water resources like Viet Nam or Lao PDR.

Launched in Vienna in May 2017, the *World Small Hydropower Development Report 2016* established globally installed small hydropower capacity (i.e. below 10MW) at 78GW, 51% of which was in China, followed by Italy, Japan, Norway and the USA. Co-authored by the United Nations Industrial Development Organisation and the International Centre on Small Hydro Power, the report also estimates South East Asia's small hydro potential at 13,642MW, with an installed capacity of only 2,340MW so far, or about 17% of the region's potential. Viet Nam has the highest share of small hydro capacity, at 78% (1,836 MW), and the highest small hydro potential (7,200 MW). The country is then followed by Indonesia, with 10% of the region's installed capacity, Thailand with 5% and the Philippines with 4%.

Still according to the report, small hydro accounts for approximately 6% of the South East Asia's total installed hydropower capacity and 1% of its total electricity generation capacity, far below what its potential could offer if properly exploited.

The development of small hydro within ASEAN is notably challenged by a number of factors such as the high cost of remotely-located projects and limited access to financing. A few countries such as Cambodia and Lao PDR also lack feed-in tariffs (FiTs) regime, further deterring investments into the sector. As ASEAN countries seek to decrease their dependence on fossil fuels and increase the share of renewable energy within their energy mix, the development of small hydro could offer sustainable alternatives to ensure energy security and energy availability to remote rural areas. In the Philippines for instance, the government's push to develop renewable energy is resulting in a fast expansion of small hydro across the archipelago.

The Philippines, which was exploiting only 5% of its 1,975 MW of small hydro potential in 2016, has moved forward to fully develop it with a series of new awarded projects and projects pending approval. The local private sector is playing a central role in this regard.

In May 2017, the National Irrigation Administration (NIA) announced it was working on the development of hydropower projects on its existing irrigation systems along with the planning of additional irrigation projects in the country. The NIA estimates that 357 irrigation sites offer potential for hydropower development in the Philippines and created a unit in early 2017 with the Philippine National Oil Company Renewables Corp to study the potential of such small hydropower projects. The private sector also intends to be part of the movement, with local utility company Manila Electric Co. and Blue Energy Holdings & Management Corp. establishing a joint venture in October 2016 to develop small hydroelectric projects in the Philippines, with the latter as majority owner.

In other recent developments, Pure Energy Holdings Corporation's subsidiary Repower Energy Development Corporation (REDC) is looking at increasing hydropower capacity to 500MW with an investment of \$500 million, up from 124MW via its small hydropower projects located in Laguna, Quezon, Camarines Sur and Bukidnon and is developing additional projects in other provinces. In December 2016, a joint venture between the Manila Electric Co. and REDC broke ground on the \$1.334 million, 10.6MW Pulanai Hydropower Project in Bukidnon. REDC has a combined total installed capacity of 124 MW

Upcoming projects notably include the 8.5MW Maris Main (South) Canal Hydroelectric project in Isabela, set to start in February 2018, the Marbel 1 Mini Hydropower Project in South Cotabato and the Butao Irrigation Drop Mini Hydropower Project in Pangasinan. Several other planned projects are awaiting clearances, including the 630kW Munoz Hydropower Project in the Upper PRIS in Nueva Ecija, the 1MW Bulanao Mini Hydropower Project in the Chico River Irrigation System in Kalinga, the 3.6MW Addalam Hydroelectric Project in Addalam River Irrigation Project in Quirino, and the Agno RIS main canal in the Agno River Integrated System in Pangasinan.