Covid-19 and hydropower

The Covid-19 pandemic will reset society and the economy. There will be significant new approaches to global governance, economic development, energy systems, and environmental and social sustainability.

While this is a time of great uncertainty, it is vitally important that economic stimulus packages not only maximise the short-term benefits of infrastructure investment, but also accelerate the transition towards cleaner and lower-carbon technologies such as hydropower.

Immediate impacts on hydropower

The Covid-19 crisis is causing an upheaval in energy markets and hydropower is not immune to these developments.

Between late March and early April 2020, IHA conducted a rapid survey of its members to find out how the coronavirus pandemic is affecting hydropower. Fifty respondents took part of which 60 per cent were heads of organisation or senior management. The survey, together with wider analysis conducted by IHA, shows the sector has been affected by the coronavirus in a variety of ways.

"Operations are digitalised and have been for about 10 years, so all stations can be operated remotely."
survey respondent

"Essential employees are still working to maintain the power supply to all customers."
survey respondent

Widespread uncertainty and liquidity shortages have put financing and refinancing of some hydropower projects at risk. Greenfield development and critical modernisation projects have also been halted due to supply chain disruptions. In addition, proposed or existing government programmes aimed at supporting the sector have been postponed.

While operations have been less affected due to the high level of automation found in modern facilities, significant falls in electricity demand and prices has had an impact. In some markets both demand and prices have contracted by up to 20 per cent and remain extremely volatile. It must be noted however that those projects covered by long-term power purchase agreements have remained largely insulated from these impacts.

All these developments have contributed to falling confidence across the hydropower sector. IHA's survey showed a more than a 20 per cent drop in confidence by survey respondents (from 77 per cent in 2018's survey, to 56 per cent in March/April 2020) on the question of whether their organisation's hydropower revenues would grow over the next 1-3 years.

In the first quarter of 2020, during the height of the Covid-19 crisis, China's Three Gorges and Gezhouba power plants generated 20.16 TWh of electricity, up 3.7 per cent from a year earlier, setting a new record and providing power to Hubei province and other regions. These handheld signs show "Go Three Gorges! Go Wuhan!" to express support from the control room of Three Gorges power plant. Credit: CTG.

Hydropower's role in responding to the crisis

Covid-19 has demonstrated the resilience, reliability and flexibility of hydropower at a time of global crisis. Due to successfully implementing business continuity plans, hydropower operators have helped 'keep the lights on' for essential sectors of the economy.

The need to ensure sufficient capacity at all times, with higher shares of variable renewable energy (VRE), has highlighted the operational challenges faced by grid operators in maintaining stability. Hydropower's flexibility was best demonstrated in India on 5 April 2020 when the country's operators restored electricity to tens of millions of households following a huge plunge in demand; this came after Prime Minister Narendra Modi called on Indians to switch off their lights for a Covid-19 vigil, leading to an unprecedented 31 GW of load variability over a nine-minute period.

In addition to continuing to provide energy and water services to local communities, there have also been inspiring stories emerging from IHA's members from across the globe. Hydropower utilities and manufacturers have been securing energy, providing relief to customers, donating medical supplies and offering support to vulnerable groups.

Photo: Engineers at the Itaipu hydropower plant, between Brazil and Paraguay, continue maintenance operations while applying strict new Covid-19 health and safety guidelines. Credit: Itaipu Binacional

Hydropower and the global recovery

As the world's single largest source of renewable electricity with unique storage and flexibility services to support the integration of variable renewables, hydropower can play an integral role in the recovery effort and the clean energy transition.

Hydropower projects can safely supply clean water for agriculture, homes and business, and help to mitigate the impacts of extreme weather events such as floods and drought. These projects can also provide vital transportation infrastructure, investment in community services and leisure and recreation.

To maximise the contribution hydropower can make to the world economy, policy-makers should recognise the urgency for a bold and ambitious green recovery plan as part of the global response to Covid-19, involving significant new investment by public and private sectors.

In its recently released Global Renewables Outlook, IRENA stated that an additional 850 GW of newly installed hydropower capacity, requiring investment of up to US$ 1.7 trillion, is needed by 2050 to support the targets of the Paris Agreement. This added capacity would also generate some 600,000 skilled jobs over the coming decade.

This means promoting greenfield and upgrade projects to help stimulate the economy, and increasing the ambition of renewable energy and decarbonisation targets. Necessary support may include fast-tracking planning approvals, introducing tax relief or low-interest loans where needed to ensure viable projects can commence, extending deadlines for existing government programmes, and properly compensating hydropower's flexibility services.

Toward this effort, IHA is building coalitions and engaging decision-makers to help ensure that sustainable and responsibly managed hydropower – constructed and operated in accordance with international good practices – is recognised as indispensable for our energy, water and climate needs.

Visit Hydropower.org for further updates on IHA's recommendations for policy-makers.

Regional news in brief

North and Central America

In the United States, total hydropower capacity, including pumped storage, remained at 103 GW in 2019. While most recent growth comes from small projects, there is still 50 GW of untapped hydropower potential, including 30 GW of pumped storage.

In Canada, hydropower remains the dominant source of electricity supply, representing 61 per cent of total electricity generation and 55 per cent of total installed generation capacity.

Mexico emphasised the need for public energy generation, and an increase in hydropower installed capacity by modernising existing assets.

In the Caribbean, which has some of the highest electricity charges in the world, countries are aiming to increase renewable energy sources (hydropower, wind and solar) to decrease dependence on fossil fuel imports for electricity.

South America

Brazil surpassed China as the largest single contributor of added capacity in 2019 with 4,919 MW. This was mainly attributed to the completion of the 11,233 MW Belo Monte hydropower plant.

The insurance company of the Ituango hydropower plant in Colombia concluded that a major incident in April 2018 is within the policy coverage. While the claim's value is still to be determined, it is expected to be one of the largest claims in the history of engineering.

The region is moving to a diversified renewable electricity mix, especially in the Southern Cone countries, which have rapidly increased capacity from wind projects.

The development of long distance high-voltage interconnections is top of the agenda to strengthen energy security in the Andean subregion.

Africa

Hydropower remains the main renewable resource in Africa with over 37 GW of installed capacity. It has the highest untapped potential in the world, with only 11 per cent utilised.

In 2019, 906 MW of hydropower capacity was put into operation across the continent. Over the last ten years, capacity has grown at an average annual rate of 4.4 per cent.

Although Africa produces just 2 per cent of the global energy-related CO2 emissions, climate-related effects are disproportionately higher in the region, impacting hydropower capacity.

As 60 per cent of the hydropower installed capacity in the region is over 20 years old, modernisation efforts are key to improving access to clean and reliable energy.

With electricity demand expected to triple by 2040, one of the regional priorities is to improve and increase the transmission and distribution assets.