
Concept Note

High-level Meeting of the Collaborative Framework on Hydropower

Wednesday, 22 September 2021, 17:00-18:30 (CEST)
(Virtual Meeting)

Background

Members at the 10th Session of the IRENA Assembly requested the Agency to expand its work on hydropower and facilitate targeted collaboration tailored to reflect opportunities and challenges for the continued deployment of hydropower technologies. In response to this request, IRENA established a Collaborative Framework on Hydropower which serves as an effective vehicle for dialogue, co-operation and coordinated action to ensure the continued deployment of hydropower technologies in benefit of the global renewable energy transformation.

Since May last year, three virtual meetings of the Collaborative Framework on Hydropower have been held to effectively establish the Framework and its thematic scope, define the Framework's General Guiding Principles and Proposed Modalities, and facilitate the sharing of experiences among Members on key priority action areas, which included hydropower sustainability, the need for policies and markets that adequately reward hydropower services, the need for modernisation and refurbishment of large shares of the global fleet and the role of pumped storage hydropower.

Additionally, the Collaborative Framework on Hydropower held a consultation meeting for Members to present their views and provide feedback on the Consultation Draft of the San José Declaration on Sustainable Hydropower, an initiative led by the International Hydropower Association (IHA) and the Government of Costa Rica. The Declaration seeks to place sustainable hydropower as an essential element in tackling climate change, highlight its key role in supporting renewables and other benefits, whilst also being clear that good sustainability practices should be a minimum expectation for the future. The Declaration also aligns with most of the priority areas highlighted by Members participating in the Collaborative Framework. At this consultation meeting Members gave positive feedback on the Declaration and expressed their will to continue to engage with this initiative.

Taking into account and building on the momentum and the knowledge gathered in previous meetings, IRENA will be organising its first High-Level Meeting on the Collaborative Framework on Hydropower. The aim is to facilitate discussions among High-Level officials and decision-makers on key hydropower-related issues and experiences, and to identify potential pathways and concrete actions needed in charting a bright future for hydropower.

This High-Level meeting will take place back-to-back with the World Hydropower Congress, hosted by the IHA and the Government of Costa Rica, so that Members may have the opportunity to engage in deliberations on the San Jose Declaration as well as other matters under discussion at the Congress.

Context

IRENA's World Energy Transitions Outlook (WETO), launched earlier this year, makes clear that the world has to urgently step up action on all fronts of the energy transition to achieve our climate and sustainable development goals. Hydropower is a critical pillar for decarbonising energy systems, both by providing clean electricity as well as the necessary flexibility for integrating high shares of variable renewables.

The WETO's 1.5°C-scenario suggests that if the world is to meet the climate goals set in the Paris Agreement, by 2050, installed capacity of hydropower should reach 2,900 GW, including pumped storage hydropower. This would mean that approximately 1,500 GW more of hydropower capacity are needed, more than double the installed capacity in 2020, with most of the remaining hydropower potential being located in developing countries.

Given the long planning and construction times of hydropower projects, swiftly answering the questions of how and where this capacity will come from will be fundamental for the sector to thrive and meet the aforementioned goals. The deployment of the required capacity also brings some challenges in itself, first in making the necessary investments, second in the need to ensure their sustainability, and lastly in ensuring that they are financially viable through fair markets and compensation.

Necessary capacity additions, modernisation and refurbishment

IRENA's latest findings indicate that while there are a large number of hydropower projects already in the pipeline for 2030 (planned, financed or under construction), the global hydropower fleet is aging and nearly half of the global installed capacity is due for retirement or will be in need of substantial refurbishment between now and 2050. The need for refurbishment also presents an opportunity for modernisation and improvement of existing plants in terms of both output and sustainability. However, this will require investments in the order of USD 2.8 trillion by 2050.

Modernisation is particularly important when considering that most hydropower plants were planned, designed and built to operate under different conditions than those of today, and therefore they are not unaffected by the changing power system. Historically, hydropower has been a source of base load generation. However, it is more and more frequently used as peaking capacity and as a source of ancillary services.

Financing new projects and refurbishment/expansion of projects poses a number of challenges often linked to finance, electricity market design, and hydro concession regimes. High upfront capital and very long amortisation periods require careful planning, cooperation between state players and developers, robust financing and risk hedging. Hydro projects, irrespective of whether large or small, need to be carefully planned, given their substantial environmental and sometimes societal impact.

Adequate policies and markets

Not all of the benefits of a hydropower plant can be easily quantified in monetary terms, which causes a disparity between financial and economic viability. Hydropower projects tend to be valued on their capacity to generate electricity, while overlooking other benefits like increased grid reliability, increased resilience to floods and droughts and multiple socio-economic benefits that are difficult to quantify. Furthermore, ancillary services provided by hydro plants are not always rewarded appropriately.

Electricity markets will have to change in order to adequately remunerate the large suite of services provided by hydropower beyond just electricity generation. As the shares of variable renewables increase in power systems worldwide, hydropower's capacity to provide ancillary services becomes increasingly more valuable. However, the majority of markets do not currently recognise or remunerate this added value; they remunerate it partially or they remunerate only a limited number of services.

Governments can be instrumental in guaranteeing the continued deployment of hydropower and in that way advance the decarbonisation of the power sector. They can help attract the necessary investment in hydropower by providing incentives, creating a suitable business environment and streamlining concessions and licencing processes, a common hurdle in hydropower project development.

Hydropower Sustainability

Despite great progress, more efforts need to be made to minimize the impact of hydropower projects. In this day and age, the importance of deploying hydropower projects that are sustainable and resilient cannot be overstated. Poor planning and management can have considerable impacts on society and the environment.

In order to avoid this, new hydropower projects need to be planned and implemented in a fully system-integrated manner, instead of at a plant-scale, prioritising the minimisation of the negative social and environmental impact without compromising their ability to generate electricity and provide ancillary and water services.

Pumped storage hydropower

Considerable amounts of pumped storage hydropower capacity will be necessary in an energy system with high shares of variable renewables. Hydropower projects with reservoirs, as well as pumped hydropower storage (PHS), represent the vast majority of energy storage capacity worldwide and they play an increasingly important role in providing flexibility to grid systems, which need to balance the fluctuations caused by variable renewables.

However, the current market and policy frameworks are not encouraging investment in new or even existing hydropower assets to provide these services, as most plants were built decades ago around day-night arbitrage business models which in many cases are insufficient to justify the investment in a Pumped Storage Hydropower (PSH) plant today, given the current market conditions.

Objectives

The High-Level meeting aims to:

- 1) Provide High-Level officials and decision-makers with greater insights on the role of hydropower in the energy transition, as well as on its current challenges;
- 2) Raise awareness and create political momentum on key hydropower-related issues;
- 3) Facilitate an exchange of knowledge and experiences amongst the participants, aiming to identify key opportunities and define the potential pathways and concrete actions that will allow hydropower to fulfil its role as an enabler of the decarbonisation of energy systems.

Agenda

	<p>Opening Jean-Christophe Fueeg, Co-Facilitator of the Collaborative Framework on Hydropower and Head of International Affairs, Swiss Federal Office of Energy</p> <p>Opening Remarks Francesco La Camera, Director-General, IRENA Rolando Castro Córdoba, Vice Minister of Energy, Ministry of Environment and Energy, Costa Rica</p> <p>Scene-setting Malcolm Turnbull, Former Prime Minister of Australia</p> <p>Dolf Gielen, Director, IRENA Innovation and Technology Centre, International Renewable Energy Agency</p> <p>Panel discussion Moderator 17:00 Jean-Christophe Fueeg, Co-Facilitator of the Collaborative Framework on Hydropower and Head of International Affairs, Swiss Federal Office of Energy – 18:30</p> <p>African Union Atef Marzouk, Acting Director for Infrastructure and Energy</p> <p>Latin American Energy Organization (OLADE) Alfonso Blanco Bonilla, Executive Secretary</p> <p>United States Department of Energy Alejandro Moreno, Deputy Assistant Secretary for Renewable Power</p> <p>The World Bank (TBC) Mari Elka Pangestu, Managing Director of Development Policy and Partnerships</p> <p>Interventions from IRENA Members and experts</p> <p>Message on the San José Declaration on Sustainable Hydropower Eddie Rich, Chief Executive Officer, IHA</p> <p>Closing</p>
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Members are invited to make interventions with a time limit of 3 minutes. Please inform the Collaborative Framework your expression of interest to make an intervention during the meeting, by 15 September 2021 by sending an email to CFHydropower@irena.org. Members who cannot attend the meeting due to time zone differences are welcome to send pre-recorded interventions by the same deadline.

Contact:

For questions related to the event, kindly contact CFHydropower@irena.org.