



THE INTERNATIONAL ENERGY AGENCY TECHNOLOGY
COLLABORATION PROGRAMME ON HYDROPOWER

IEA Hydropower

ANNEX IX Phase II-Valuing Hydropower Services

Utilization of Hydropower Flexibility Capability in Evolving Energy Systems

Kick Off Workshop

INVITATION to PARTICIPATE

The International Energy Agency Technology Collaboration Program on Hydropower will be holding a Kick-Off Workshop from midday on Monday 3 December to midday on Wednesday, 5 December 2018, in Brussels, Belgium. This will cover the work of ANNEX IX Phase II-Valuing Hydropower Services - Utilization of Hydropower Flexibility Capability in Evolving Energy Systems.

You are invited to attend and participate

The overall purpose of the Kick-Off workshop is to define the scope of research and the work plan to reach the Annex Objectives, as well as confirm the participants who will contribute to the Annex.

The workshop will start with key note presentations by the IEA and others on the work being undertaken on related topics covering valuing hydropower flexibility. This will be followed by a “gap analysis” to identify key research topics, required to meet the Annex objectives that are not presently being covered. The workshop will conclude with the development of a work plan and the participant’s contributions to the research.

**For more information or to register your interest contact the IEA Hydro Secretary
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BACKGROUND AND ANNEX DESCRIPTION

Phase I of Annex IX culminated in a Summary Report, which was launched at HYDRO 2017 and is posted on the IEA Hydro website. In addition, an Executive Summary to the report was prepared as a stand-alone document. Phase I investigated methodologies to value the services provided by storage hydro projects through the establishment of the economic values of energy management, water management and other socio-economic services.

Since the start of Phase I, two key issues affecting the hydropower sector have arisen; the penetration of variable renewable energy (VRE) sources has increased substantially and the potential impacts of climate change are being recognized. These dynamics pose both challenges and opportunities for hydropower and require further exploration and analysis beyond the scope of the original Annex work. This will form the basis of Phase II.

Phase II will consider the role of hydropower in producing significant amount of firm renewable energy and storage to support VRE's, and providing flexible energy and balancing services to support electricity systems – collectively termed 'hydro balancing'. In addition it will investigate hydropower's potential role for water management and climate change mitigation. Specifically, Phase II will develop an understanding of three key strategic themes:

- How hydropower will be valued in future electricity markets scenarios, including the need for energy storage, reliability and system security services etc.
- How hydropower will be valued in future electricity markets, including the need for energy storage and hydropower's position in the value chains of other sectors, i.e. clean metal production, electrification of transport, hydrogen etc.
- How hydropower will be valued in providing climate change adaptation services (e.g. flood control).

ANNEX OBJECTIVES

The work plan will be subdivided into three Tasks.

TASK 1 – Energy, Grid Services and Adaptation

Task 1 Objectives

1. To present a holistic coverage of the role of hydropower in providing hydropower balancing and flexibility services to the electricity grid. This will allow hydropower developers, agencies, regulators and stakeholders to have a clear understanding of the issues and options for management and mitigation.
2. To highlight the important role for hydropower in new and transitioning power systems globally. This will enable the appropriate valuing (and incentivizing) of hydropower balancing and flexibility services. Subsets of this Objective include:
 - Clearly identifying the role of hydropower and the energy services provided in various future scenarios,
 - Addressing issues, alternatives and options for flexibility and balancing
 - Estimating costs in providing services and subsequent benefits to the power system

TASK 2 – Climate Change Adaptation Services:

Task 2 Objectives

1. Understanding the role of hydropower in minimising or mitigating risks associated with a changing climate
2. Assessing the value that hydropower provides in minimising or mitigating risks associated with a changing climate

TASK 3 – Hydropower Balancing and Flexibility Roadmap.

Task 3 Objective

To collate the outputs from Annex Tasks into a Hydropower Balancing and Flexibility Roadmap and its dissemination.
