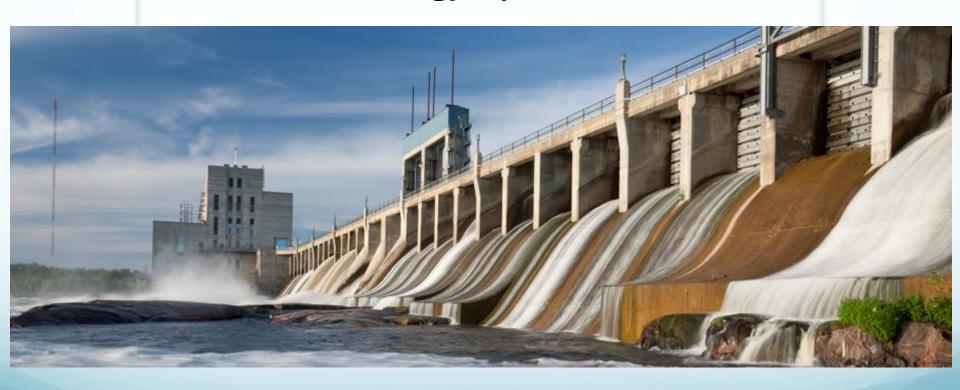


Annex IX: Valuing Hydropower Services – Phase II Utilisation of Hydropower Flexibility Capability in Evolving Energy Systems



Alex Beckitt, IEA Hydro Chair February 2019, Japan

Program Current IEA Hydro Membership

- Australia Hydro Tasmania
- Brazil Ministry of Mines and Energy, CEPEL
- China China Yangtze Power Co/International Centre for Small Hydropower
- European Union European Commission
- Finland Finnish Funding Agency for Technology & Innovation (TEKES)/Kemijoki Oy
- Japan New Energy Foundation (NEF), Agency for Natural Resources & Energy (MITI)
- Norway Norwegian Water Resources & Energy Directorate (NVE)
- USA US Department of Energy, Oak Ridge National Laboratory (ORNL)



Annex IX: Valuing Hydropower Services

Declining costs and **decarbonisation** objectives are driving the uptake of variable renewable energy (VRE) in electricity sectors around the globe.

Annex IX is focussed on understanding and communicating the role and value of hydropower in future energy systems, and identifying best practice methodologies in specific markets/contexts to ensure efficient utilisation of global hydropower assets.

Annex IX: Phase I - Focus/Scope

Phase I identified that the various value chains of Hydropower are not always appropriately recognised for services contributing to positive energy market and water management outcomes. Phase I focussed on:

- Services provided to energy security, water security and sustainable development;
- Methods to value energy and water management services;
- Approaches to quantify value of services;
- Preliminary valuations of energy and water management services;
- Identifying appropriate valuation methods; and
- Methodologies to estimate fair allocation of costs.

Phase I concluded with the production of a summary report which was launched at HYDRO 2017. Summary report available at www.ieahydro.org

Annex IX: Phase II - Focus/Scope

ワークショップのサマリーは"IEA hydro"のウェッブサイトで入手できます。

Phase II will address issues and gaps identified in phase I. This work will focus on two key tasks. These are:

- Task one Energy, Grid Services and Adaptation
 - The role/value of hydropower in future energy markets
- Task two Climate Change Services Adaptation
 - The role/value of hydropower in minimising/mitigating climate change risks

Key Outputs

 Production of a Hydropower Roadmap for distribution, based upon the findings of tasks one and two.

Annex IX: Phase II - Task one

Energy, Grid Services and Adaptation

There are two key objectives of task one:

- 1. Identify why hydropower balancing and flexibility will be needed in future market scenarios; and
- 2. Enable the appropriate valuation (and development of incentives) to support the development of hydropower resources in transitioning power systems.

This work will consider/address:

- Gaps in Phase I work
- Technical issues/requirements
- Market and commercial aspects
- Current approaches for provision of hydro balancing and flexibility

- Environmental and social aspects
- Alignment of work with IEA's storage and integration work
- Collate information for roadmap and dissemination



Annex IX: Phase II - Task two

Climate Change Services Adaptation

There are two key objectives of task two:

- 1. Understand the role of hydropower in minimising/mitigating climate change risk; and
- 2. Assess the value of hydropower in minimising/mitigating risks associated with a changing climate.

The work will consider/address:

- Gaps in Phase I work
- Role of hydropower in valuing climate risk minimisation/mitigation
- Assessing value of hydropower in managing climate risks

- Current approaches in managing water resources under climate change scenarios
- Collate information for roadmap and dissemination.

Hydropower Balancing and Flexibility Roadmap

The findings of task one and two will inform the development of a hydropower balancing and flexibility roadmap. This will be developed to provide information to:

- Hydropower developers/operators;
- Government agencies; and
- Policymakers, regulators and other key stakeholders.

The intent of this roadmap is to deliver:

- 1. A basis for international collaboration on hydro balancing/flexibility;
- 2. Strategic direction and advocacy for hydropower operators; and
- 3. Evidence of the value of hydropower to policymakers.

If you would like to learn more about Annex IX, please contact Alex Beckitt at alex.beckitt@hydro.com.au

Thank you 有難うございました。