



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



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## *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](http://www.ieahydro.org)*



## *Annex IX: Phase II – Focus/Scope*

ワークショップのサマリーは“IEA hydro” のウェブサイトで見ることができます。

*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.*





THE INTERNATIONAL ENERGY AGENCY TECHNOLOGY  
COLLABORATION PROGRAMME ON HYDROPOWER

**IEA** Hydropower

If you would like to learn more about Annex IX, please contact Alex Beckitt at [alex.beckitt@hydro.com.au](mailto:alex.beckitt@hydro.com.au)

**Thank you**

**有難うございました。**