

European Energy Research Alliance (EERA)
JP clean Energy tranSition for Sustainable Society (e3s)
JP Hydropower
tJP Digitalization for Energy

WORKSHOP
REVAMPING hydropower research

Brussels
September 24th, 2024

Europe is challenged by raising energy prices following from the Russia's invasion of Ukraine and the need to cost effectively speeding up the clean energy transition (CET) to reach the [FIT for 55](#) goals of 55% greenhouse gas emissions in 2030, the newly proposed 2040 targets of 90% reduction and the Paris agreement targeting a zero-emission society from 2050. This requires a cross-covering approach which was already suggested in EERA's [White Paper on Clean Energy Transition](#), published in October 2021. To follow up on this ambition, this call for papers is issued targeting the above challenge in the light of EERA Joint Programmes (JP) "[clean Energy tranSition for Sustainable Society](#)" (e3s), "[Hydropower](#)" and the transversal Joint Programme "[Digitalization for Energy](#)".

This has become even more relevant considering recent policy papers such as the [Nature restoration law](#), the cross-cutting digitalization group of the [SET Plan](#) following up on the [Digitalising the energy system - EU action plan](#) and not least the revised [Net-Zero Industry Act \(NZIA\)](#) that mentions hydropower as one of the strategic technologies in the clean energy transition. With this background, it is very relevant to explore and extend the research frontier across different Joint Programmes for the revamped role of hydropower in the CET.

This call addresses the main challenges of how hydropower technology combined with digitalization, grid and market integration can contribute to a faster and cost-effective transition providing more flexibility to the power system while utilizing digitalization and under a broad understanding of the do-no-harm strategy. By this we mean respecting the need for nature conservation, restoration and give new insights in the crossing of hydropower and social science. The research needs are many and diverse, the workshop will focus on the following topics:

- i. **The role of hydropower in the CET:** addressing how Europe can make the most out of its hydropower resources in terms of challenges such as: integration on of renewable energy, speeding up the transition, build a European competitive edge with new hydropower technology.
- ii. **LCA, biodiversity, public acceptance of hydropower:** investigating how LCA can be adapted to include hydropower specific characteristics and complement other methodologies for assessing biodiversity, how should hydropower be developed to increase biodiversity and water security in Europe under the umbrella of do-no-harm.
- iii. **Digitalisation for unlocking the hydropower potential and the clean energy transition in general:** how can digitalisation reform the hydropower sector and be the tool for unlocking new potential and improved utilization that decreases cost on all levels from refurbishment to operation and maintenance.

During the workshop there will be possibilities to build new network, learn about different perspectives of hydropower, digitalization, social and environmental science. Accepted papers will be collected and published in a peer-reviewed journal.

For each of the above topics, contributions on the subtopics listed below are welcome.

TOPICS & SUB-TOPICS

The role of hydropower in the CET

- Being an energy or a flexibility supplier
- How can new hydropower technology contribute to CET
- Hydropower, an enabler of renewables
- Storage capacity from hydropower plants
- Sustainable, reliable and secure energy supply
- Socio-economic benefits

LCA, biodiversity and public acceptance of hydropower

- New upgraded LCA techniques for hydropower
- The social impacts of hydropower along the supply chain (S-LCA)
- Social Acceptance of Hydropower
- Social Engagement for inclusive decision making in Hydropower
- Competing water uses
- Hydropower taxonomy
- Flood control
- Water security

Digitalisation for unlocking the hydropower potential and the clean energy transition

- Digitalisation in hydropower ex. for improving: operation with inflow and price forecasting and compliance with environmental constraints
- Digitalisation in investment analysis
- HPC and HTC simulations in Hydropower and other energy sectors
- Data curation and transfer in Hydropower and other energy sectors
- AI perspectives and methodologies on a CET, including hydropower challenges, materials, operation and investment

Timeline:

- 17 April 2024 Abstract* submission deadline
- 30 April 2024 – Abstract acceptance notification
- 15 June 2024 – Full length paper** submission
- 15 July 2024 – Acceptance notification for oral presentation and communication of possible remarks/feedback
- 1 August 2024 – Final full length paper submission (this applies only to papers that received remarks/feedback/requests of improvement)
- 15 August 2024 – Final decision and confirmation for oral presentation

*Abstract proposal requirements:

- The abstract must be submitted in English;
- Between 400-500 words (Times New Roman 12, 1.5 line-spacing);
- The abstract should be developed according to the following structure:
 - Title;
 - Main topic and subtopics;
 - Background and motivation;
 - Methodology;
 - Main results and implications.
- It must be sent to:
 - EERA JP e3s manager: m.menon@eera-set.eu

- EERA JP Hydropower manager: m.campajola@eera-set.eu

****Full length paper requirements:**

- Papers must be submitted in English and formatted according to the IEEE format;
- Maximum length of the accepted papers will be 10 pages;
- Only authors who have received notification of acceptance of their abstract will be invited to submit full length papers and only papers that are finally accepted for presentation will be included in the publication;
- The publication will include an introduction to the paper collection that will be developed by the scientific committee.

Publishing:

Papers which are accepted and successfully presented in the workshop will be published in [IOP Conference Series: Earth and Environmental Science \(EES\)](#); online ISSN: 1755-1315.

Scientific Committee:

- Eleonora Annunziata - Sant'Anna School of Advanced Studies (Italy)
- Michael Belsnes - SINTEF Energy (Norway)
- Ole Gunnar Dahlhaug - NTNU (Norway)
- Eduard Doujak - TU Wien (Austria)
- Berit Köhler, NINA (Norway)
- Rafael Mayo-Garcia - CIEMAT (Spain)
- Alessandro Sciullo - University of Turin (Italy)
- Ayşen Sivrikaya - Hacettepe University (Türkiye)
- Elena Vagnoni - EPFL (Switzerland)

Questions:

For questions or additional information, please send an email to:

- JP e3s manager: m.menon@eera-set.eu
- JP Hydropower manager: m.campajola@eera-set.eu