



# Hydro Energy & Sustainability 2019

## *What future for Hydropower in France and in Europe ?*

226<sup>th</sup> session of SHF Scientific and Technical Committee  
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Bissorte – P. Tournaire (EDF)

Hydropower is the biggest source of renewable electric energy. Its contributions to electric systems and grids are well acknowledged. Main advantages are: low cost, flexibility, storage, ancillary services. Its important role within the energy transition with the possibility to storage is well acknowledged.

Beyond electric generation, Hydropower also plays a significant role in the social and economic developments of territories and valleys, thanks to multi-purpose reservoirs which help meet irrigation needs, support low water flow conditions, secure water supply, and ensure flood control.

The electric sector is facing a number of not-ever-seen evolutions, and Hydro operators are now facing new and tough challenges, which cover a large spectrum of issues:

- Social expectation with respect to water use, water sharing and environmental impacts;
- Electric power markets deregulation, low spot market prices, low spread between peak and off-peak power prices, together with a huge development and penetration of new intermittent renewable power installations (wind-power and PV mainly);
- Smarts-grids, small generation equipment and smart-use of electric power;
- Reinforcement of regulatory requirements – for both environment and safety – in the two last decades: e.g. the European Water Framework Directive and its national implementations ; new dam safety legislation (particularly in France since 2007 : “Etudes de Dangers”, Safety review, Flood and seismic risk management);

Nonetheless, the advantages and strengths of Hydropower are known; they have been recently highlighted and disseminated in the community: “White paper for Hydropower” (in French: “Livre Blanc de l’Hydroélectricité”), published in 2017 by UFE, SER, and France-Hydro-Electricité ; “Manifesto for dams & reservoirs” published by the European Club of ICOLD ; Guidelines and the protocole for Hydro Sustainability, published by IHA few years ago.

To address the aforementioned challenges, the Hydropower actors have developed innovations and new operation models.

It is time for the **French Hydro Society (SHF)** to gather all the pieces of this puzzle, and to share the relevant scientific and technical information about the role that Hydropower can have in France and Europe.

In the current climatic and transitional contexts, this conference will focus on the main contributions of Hydropower in Europe, addressing also the controversies on the sensitive issues.

The conference will then address the following issues:

## **Theme 1: The role of Hydropower in the French and European electric systems, in the perspective of transition of energy model: panorama and case studies**

- 1a) How Hydro is contributing and creates value to electric grid needs in France and Europe: flexibility, ancillary services, energy storage, complementarity with fatal intermittent renewable power;
- 1b) Role of Hydro pumped-storage plants (PSP) in the electric system: examples based on existing PSP; what business plan for PSP, what economic model in the future? Opportunities for micro/mini-PSP;
- 1c) Development of small Hydro: success stories; obstacles;
- 1d) The economy of Hydropower: e.g. the structure of Hydro kWh costs; O&M costs; taxes; TURPE for PSP;
- 1e) Legal framework for Hydro development;
- 1f) Special tariffs model for Hydropower (incentives etc.).
- 1g) Hydropower under climate change, new opportunities

## **Theme 2: Hydropower, an energy for the future: innovations ...**

- 2a) **for environmental integration of Hydro projects, impacts mitigation techniques:**
  - ✓ Sediment management
  - ✓ Fish migration, fish development conditions (fish-friendly technology)
  - ✓ Water quality management;
- 2b) **for more flexibility of machines (e.g. variable speed, joint Hydro-battery systems) to respond to grid needs**
- 2c) **for a better safety and performance of Hydro assets:**
  - ✓ Reduction of friction in adductions
  - ✓ Flood and seismic risk management
  - ✓ Surveillance and monitoring technology;
- 2d) **for the rehabilitation and upgrade of Hydro projects:**
  - ✓ Dam crest and reservoir capacity increase opportunities;
  - ✓ Climate-induced opportunities for Hydro (e.g. glacier-melt-based lakes harnessing opportunities);
- 2e) **For developing new Hydro marine energy technology (in-stream turbine, tidal range & tidal garden technology) and river**

## **Theme 3: Hydropower and society: integration of Hydro projects in territories; multi-purpose reservoirs; sociology of Hydropower**

- 3a) **Real examples from the ground of multi-purpose reservoirs, success conditions and solutions to conflicts;**
- 3b) **Water usage conflicts in the perspective of climate change impact on water resources; smart allocation/ management of water resources;**
- 3c) **Sociological perspective of Hydro assets: appropriation by local/regional communities.**

This conference is proposed for all practitioners in the Hydro business: Hydro equipment suppliers; operators of Hydro power plants (HPPs), investors, electric systems operators; transmission line operators, NGO representatives, Communities representatives, engineers, researchers.

**The conference language will be English. No simultaneous translation available.**

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This HydroES conference stands within a series of conferences organized by SHF in the last decade.

- Environment & Hydropower in 2010 (Lyon)
- Storage & Hydropower: challenges and opportunities in 2011 (Lyon)
- Marine renewable energy in 2013 (Brest)
- Enhancing Hydropower plants in 2014 (Grenoble)
- Environment & Hydropower in 2016 (Grenoble)

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### **Organizing committee:**

#### **Chair of conference: Didier Roult (CNR):**

- ✓ Denis Aelbrecht (EDF - CIH)
- ✓ François Avellan (EPFL)
- ✓ Guy Caignaert (ENSAM-SHF)
- ✓ Anna Dupont (SHF)
- ✓ Aurélie Dousset & Jean-Marc Levy (FHE)

- ✓ Bettina Geisseler (GEISSELER Law firm, Germany)
- ✓ Claire Magand (AFB)
- ✓ Olivier Metais (INPG - Grenoble, Chair of SHF)
- ✓ Anton Schleiss (EPFL)
- ✓ Pierre Louis Viollet (Chair of BCST - SHF)
- ✓ Neda Sheibani (Conference Secretary - SHF)

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