ACHIEVING THE ENERGY UNION TARGETS

Goals of European Hydropower R&I Funding

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A European Green Deal
Striving to be the first climate-neutral continent

The EU will:

- Become climate-neutral by 2050
- Protect human life, animals and plants, by cutting pollution
- Help companies become world leaders in clean products and technologies
- Help ensure a just and inclusive transition

COM(2019) 640 final: The European Green Deal
COM(2020) 21 final: Sustainable Europe Investment Plan; European Green Deal Investment Plan

Research and Innovation
Hydropower in Europe

- Limited potential of additional capacities, but high potential in energy system services
- Strong technology base

- Challenges and opportunities:
  - Refurbishment
  - Flexible operation / grid balancing
  - Sustainability, e.g. water/river connectivity

- Overall R&I strategy:
  - Long-term challenges require continuous efforts
  - Maintain European hydropower research and industry value chains
  - Global cooperation on sustainable hydropower
Global Hydropower Developments

**Figure 3.20** Shares of hydropower and total renewable sources in global electricity generation, 1990-2020

**Figure 3.17** Hydropower capacity investment globally (left) and by region (right), 2011-2020 and 2021-2030

Global Exports in 2019 (878 M EUR)

- EU: 48%
- China: 14%
- India: 24%
- Brazil: 6%
- USA: 5%
- Other: 3%


Research articles on hydropower 01/2016 – 08/2020

Cluster 5 WP
Destination - Sustainable, secure and competitive energy supply

**Renewable energy**
- Fostering European global leadership in affordable, secure and sustainable renewable energy technologies and services by improving their competitiveness in global value chains and their position in growth markets, notably through the diversification of the renewable services and technology portfolio
- 20 topics in 2021 (335 M€)
- 24 topics in 2022 (368 M€)
- Issues: disruptive technologies, cost reduction, improved efficiency, de-risking, integration, export potential, sustainability, market uptake

**Energy system, grids and storage**
- Ensuring cost-effective uninterrupted and affordable supply of energy to households and industries in a scenario of high penetration of variable renewables and other new low carbon energy supply.
- Managing smart and cyber-secure energy grids and optimisation the interaction between producers, consumers, networks, infrastructures and vectors
- 10 topics in 2021 (152 M€)
- 7 topics in 2022 (181 M€)
- Issues: energy sector integration, energy system planning and operation, active consumer, markets and energy communities, digitization

**Carbon Capture, Utilization and Storage**
- Accelerating the development of Carbon Capture, Use and Storage (CCUS) as a CO₂ emission mitigation option in electricity generation and industry applications (including also conversion of CO₂ to products)
- 2 topics in 2021 (32 M€)
- 1 topic in 2022 (58 M€)
- Issues: CCUS hubs, application in industry, CO2 capture

**Cross-cutting**
- Geological services (2021; CSA; 20 M€)
- Stakeholder support (2021; CSA; 9.8 M€)
- Clean Energy Transition co-funded Partnership (2021-2027; 210 M€ in total)
Hydropower in Cluster 5 WP 21/22

- **HORIZON-CL5-2021-D3-03-11** Development of hydropower equipment for hidden hydropower
- **HORIZON-CL5-2022-D3-03-08** Development of digital solutions for existing hydropower operation and maintenance
- **HORIZON-CL5-2021-D3-02-15** Support to the activities of the ETIPs and technology areas of the SET Plan

Other relevant topics:
- Digital solutions addressing synergies in international renewable energy value chains
- Energy system modelling and tools
- Innovative forms of storage and their successful operation and integration into innovative energy systems and grid architectures
- Innovative plug-and play solutions for system management and renewables storage in off-grid applications
Thank you for your attention!