Session:

Macroeconomic benefits of hydropower
Can we quantify them?

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For more information: www.hydropower.org/congress
An Initiative of Hydropower Companies and Organisations in Europe

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eurelectric
Most comprehensive assessment of European hydropower to date

- View of the role of hydropower in Europe, today and in the future
- Joint work by DNV GL and the hydropower sector
- Use of different instruments and methodologies
  - Survey of hydropower generation companies and equipment manufacturers
    (Representing ~95% of capacity installed in EU-28, Norway, Switzerland and Turkey)
  - Modelling
  - Qualitative assessment

Electricity from Hydropower

Power-related benefits
- Reliability and flexibility
- RES integration
- Avoided CO₂ emissions

Multi-purpose benefits
- Water management and environmental services
- Regional development

Macroeconomic benefits
(value creation, employment, tax revenues, security of supply, etc.)
Basis of Analysis

Electricity Market Modelling
- Comprehensive simulation of European power market
- Several scenarios and sensitivities for 2030
- Impact on wholesale prices, fuel consumption, CO2 emissions etc.

Macroeconomic analysis
- Comprehensive survey of European hydropower companies and associations (>90% of capacity covered)
- Input-output analysis of induced price effects

Technology & Innovation
- Based on survey among hydropower generation companies and equipment manufacturers
- Research of publicly available studies and reports

Value of European Hydropower
Main chapters in the study and results on

- The role of European hydropower today and in the Future
- Value creation for the European economy
- Ensuring high-value employment
- Supporting public finances
- Promoting sustainable supply of electricity
- Supporting affordability and competitiveness
- Contributing to security of supply of the power system
- Reduces costs for combustion of fossil fuels
- Technology leadership and innovation
Facilitating the integration of variable renewables

- Europe’s climate and energy goals are based on ambitious growth of variable RES
- Successful integration requires flexible and firm capacity as well as storage
- Various examples illustrate important role of European hydropower for RES integration:
  - Flexibility of hydropower facilitates integration of variable RES in Denmark, Germany and Spain
  - Firm capacity of (pump) storage plants in the Alpine region is important for generation adequacy in Southern Germany
  - Storage potential of Nordic hydropower helps to avoid curtailment of Danish windpower

Hydropower is perfectly suited for dealing with the challenges of integrating increasing volumes of variable renewables into the European power system
Multipurpose effects challenging to quantify

- **Water supply**
  - Different purposes and water uses, incl. Agriculture, drinking water, industrial processes, cooling water
  - Possible impact greater than 10bn p.a.

- **Flood mitigation**
  - Using storage capacities and dikes
  - Avoiding or reducing damages from flood events of many billion Euros – but difficult to estimate

- **Navigation**
  - Transportation of goods using vessels as alternative to other modes of transportation
  - Benefits estimated at several hundred to two billion Euros p.a.

- **Tourism**
  - Facilitating water sports and other tourist activities at and around hydropower plants’ water reservoir
  - Up to EUR 200 in value creation for selected reservoirs

- **Other**
  - Various other functions, incl. Collection of floating residues, providing water for fire planes, fishery and agriculture
Key Benefits of European Hydropower

- Hydropower accounts for 18% of total electricity supply and approx. 60% of electricity from renewable energy sources in Europe.
- EUR 38bn contribution to European GDP p.a., value creation per FTE eight times higher than European average (manufacturing sector).
- Hydropower contributes to an affordable, secure and sustainable supply of electricity to European consumers.
- Hydropower is perfectly suited for dealing with the challenges of integrating variable RES – today and in the future.
- European hydropower manufacturers spend more than 5% of revenues on R&D, in order to maintain global technology leadership.

European hydropower creates major value for the European economy and substantially contributes to reaching European energy and climate goals.
THANK YOU

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SVP Industrial Development
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