

Small Hydropower

A driver to decarbonised energy and to flexibility of future electricity systems

20 GW of small hydropower installed capacity in Europe

Europe has developed nearly 34% of its SHP potential. However, 66% remains untapped and will be a key driver of the EU's energy decarbonisation strategy.

Flexibility through hydropower for the integration of renewable energy

Small hydropower production:

- has modulation capabilities in terms of balancing power and voltage,
- presents low variability and high predictability,
- meets needs for flexibility in the electricity system of variable renewable energy sources (VRES),
- contributes to the reduction of transmission losses and to voltage control thanks to decentralisation of facilities.

Technological maturity

Small hydropower:

- is a mature technology with many years of experience and digitalisation capabilities,

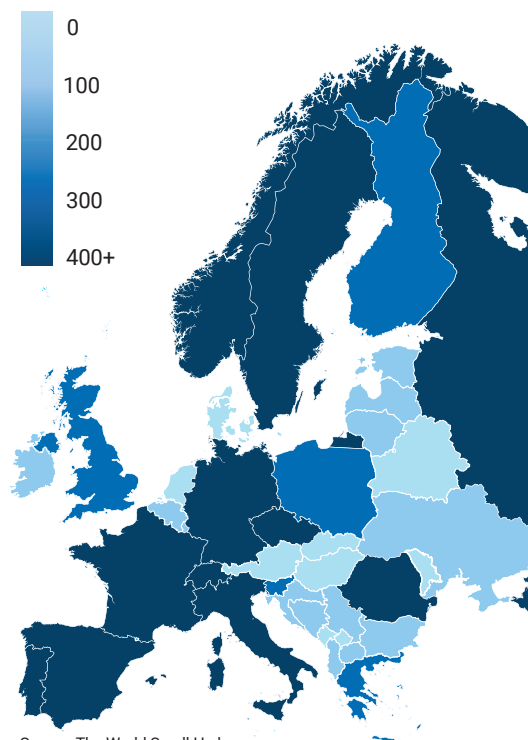
- has more than several thousand installed and operational plants,
- continues to implement advanced technologies for greater flexibility and environmentally friendly solutions,
- is optimised to minimise the impact on ecosystems while maximising carbon-free electricity production.

High-quality and secure electricity supply for all citizens

Small hydropower can respond in real time to increased demand (including in the event of a blackout)! There are few or no renewable-related alternatives to hydropower that can deliver emission-free solutions – particularly over similarly long period as hydropower does. The value of flexibility to the power system and electricity users needs to be properly valued, but is a key factor in the future electricity system.

Hydropower has a significant role to play in maintaining a well-integrated renewable mix.

Small Hydropower (SHP) installed capacity by country (MW)



Source: The World Small Hydropower Development Report (WSHPDR) 2019



Source: IOZE hydro

Creating local jobs

Small hydropower development contributes to creating local jobs and supports the small and medium-sized family businesses, especially in rural areas.

In the European Union, the number of direct jobs created only by small hydropower sector is estimated to be around 60,000.

Small hydropower, contributing to UN SDGs

Hydropower makes it possible to meet some of the most important UN Sustainable Development Goals (UN SDGs), in particular:

- 7 Affordable and Clean Energy
- 8 Decent Work and Economic Growth
- 9 Industry, Innovation and Infrastructure
- 11 Sustainable Cities and Communities
- 12 Responsible Consumption and Production
- 13 Climate Action
- 15 Life on Land



Source: <https://sdgs.un.org/goals>

High-quality testing facilities

Next to the leadership in manufacturing, many leading universities and research centres specialising in hydropower are located in Europe. They include professional testing facilities for devices ranging in size from miniature, research models to full scale production turbines, tested in order to optimise flexibility, operational conditions, and cost of the devices, as well as to improve R&D capacities of these facilities themselves.

Thanks to laboratory developments, the total efficiency of small hydropower can attain levels exceeding 85%.

A network of professionals

The European hydropower industry is regarded as a world leader, able to build

tailor-made hydropower facilities worldwide. European competence in the production of hydropower equipment accounts for around two-thirds of the global market.

The Small Hydropower Chapter of the EREF represents small hydropower sector at EU level. It hosts and moderates several networks of hydropower associations and industry stakeholders.

EREF and its members aim to secure and enhance small hydropower's place as an important contributor to Europe's renewable energy mix and to create business opportunities for many small and medium-sized hydropower producers.



Source: Mhyllab



Source: Arbeitsgemeinschaft Wasserkraftwerke Baden-Württemberg

40 GW of small hydropower additional capacity in Europe needed to ensure the EU Energy Transition

Additional capacity also exists in existing power plants – this can be harnessed through modernisation, refurbishment and the introduction of modern modes of operation, as well as through the use of so-called hidden hydropower – which means the retrofitting of non-powered dams with power-generating equipment and the installation of hydroelectric machinery in environmental flow outlets, as well as in existing water infrastructure such as drinking and waste-water networks, ship locks, irrigation canals, tailrace canals of large hydropower plants, desalination stations, cooling systems and other industrial systems.

Arbeitsgemeinschaft Hessischer Wasserkraftwerke



Dirk Hendricks

✉ dirk.hendricks@eref-europe.org

Vincent Denis

✉ vincent.denis@mhyllab.com