

An aerial photograph of a river winding through a lush forest. The trees are in various stages of autumn, with some showing bright yellow and orange leaves, while others remain green. The river is a deep blue-green color, reflecting the surrounding foliage. The landscape is a mix of dense forest and open areas, possibly a wetland or a restored natural area. The overall scene is peaceful and scenic, highlighting the beauty of nature.

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EU Hydropower:

**A sector contributing to nature conservation
and restoration**

EU rivers are heavily impacted by human activities

The river systems in the European Union span over 1.2 million kilometres¹, providing a wide range of essential ecosystem services. **However, these rivers are in poor condition due to various human activities.**

Agriculture, urban development, flood protection, water supply for different purposes and power generation had significant impacts over centuries. Extensive alterations, such as the straightening and channelling of rivers, separation of floodplains and oxbow lakes, water extraction, and the construction of various barriers, have disrupted natural continuity and degraded vital habitats.

As a result, freshwater species are experiencing a rapid decline, a situation exacerbated by advancing climate change.²



However, EU legislation aims to reverse this trend



The HD aims to protect over a thousand species and 230 habitats, ensuring their favorable conservation status. Member States must designate Special Areas of Conservation (SACs) with appropriate management. Along with areas under the Birds Directive, these SACs form the Natura 2000 network, the largest coordinated network of protected areas globally. ³



The WFD seeks to restore and prevent further deterioration of the EU's rivers, lakes and groundwater. To achieve this, Member States are required to develop and implement River Basin Management Plans aimed at reaching good chemical and ecological status or potential in all water bodies by 2027. ⁴



The NRR aims to restore nature across the EU's land and sea, ensuring long-term biodiversity recovery, aiding climate goals, and fulfilling international commitments. It sets binding restoration targets for habitats, species and key ecosystems like agriculture, forests, and rivers. Member States are required to implement these targets through national restoration plans. ⁵



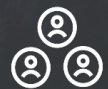
The **EU Hydropower** sector is taking its responsibility seriously

Aware that hydropower impacts rivers, their habitats and species, the sector is committed to minimising negative effects during development, construction and operation, aiming for a positive outcome for nature.

This commitment is demonstrated through:



Adherence to the Mitigation Hierarchy: Prioritising actions that avoid, minimise, restore and offset environmental impacts.



Community involvement and engagement: Actively involving local communities in the project development and decision-making processes.



Strict compliance with regulatory requirements: Plant design, construction and operation adhere to EU and national regulations and standards.



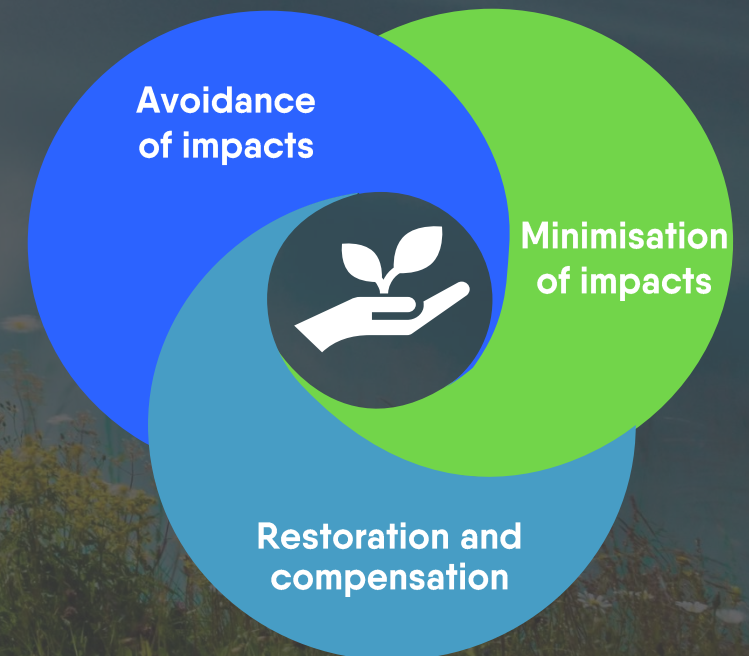
Finding synergies and maximise benefits: Cross-sector cooperation aims to generate the most beneficial outcome for the environment.



Prioritising refurbishment and upgrades: Focusing on impaired river stretches and utilising existing infrastructure for powering, repowering and upgrading instead of constructing new facilities.



Conducting extensive research and monitoring: Engaging in comprehensive studies to understand and mitigate negative impacts, while sharing the gained scientific knowledge.



Habitats, species and river continuity...



Spjutmo (34 MW), Blyberg (15 MW), Väsa (15 MW) – Sweden

Measure:

River continuity restoration

Investment:

€ 36 million

Details:

Three fish ladders are being constructed to facilitate both up- and downstream fish migration. The ladder features a space-saving, ramp-like structure that loops over itself, similar to a parking garage design. To guide fish to the entrance, an innovative mammoth pump is installed using air and water pressure to generate a strong attraction flow.

Jochenstein (132 MW), Passau-Ingling (96 MW), Schärding-Neuhaus (96 MW) – Austria

Measure:

Habitat and river continuity restoration

Investment:

€ 65 million

Details:

The installation of fish migration facilities at three hydropower plants, along with the restructuring of riverbanks, will reconnect previously isolated habitats. These efforts will enhance biodiversity and increase species populations.

Kühltai (190 MW) – Austria

Measure:

Hydropeaking mitigation and habitat restoration

Investment:

€ 22 million + € 13 million

Details:

A retention basin with a capacity of 300,000 m³ was constructed to reduce discharge fluctuations from the hydropower plant into the downstream river, thereby mitigating the effects of hydropeaking. In addition, over a stretch of 3 kilometers, the existing bank protection was removed and the riverbed widened, promoting the development of a side channel, backwater zones, and a natural riverbank.

Romanche-Gavet (94 MW) – France

Measure:

River continuity and habitat restoration

Investment:

€ 400 million

Details:

Five consecutive barriers were removed and replaced with a single, upgraded facility. In addition to significantly increasing capacity, this initiative restored a free-flowing river stretch and revitalised terrestrial and fluvial habitats.

...are restored all over Europe



La Florida (7.5 MW) – Spain

Measure:

River continuity restoration and habitat conservation

Investment:

€ 3 million

Details:

The installation of a fish-friendly Archimedes screw turbine allows for the controlled release of the necessary ecological flow to preserve downstream habitats and species. In addition, the river continuity was enhanced by installing a technical fish pass.



Ottensheim-Wilhering (179 MW) – Austria

Measure:

Habitat and river continuity restoration

Investment:

€ 250 000

Details:

In the estuary area of the tributary “Große Rodl” near the hydropower plant, an obsolete barrier was removed to allow fish migration. In addition, around 200 meters of hard shoreline were removed and shallow gravel banks restored.



Several Hydropower Plants – Spain

Measure:

Species conservation

Investment:

€ 200 000

Details:

By using light sensors, camera traps and sound recording devices, this initiative aims to assess and minimize the impact of human presence in caves associated with hydropower plants on bat colonies with the aim of conserving the bat populations and improving their habitat.



Marieberg (0.9 MW) – Sweden

Measure:

River continuity restoration

Investment:

€ 1.5 million

Details:

By removing the hydropower plant, both longitudinal and lateral connectivity were restored, leading to improved habitat conditions. The loss of power generation was deemed acceptable considering the environmental improvements.



5 essential calls for scaling up nature restoration



Recognise the hydropower sector's efforts in meeting the objectives of the EU nature legislation while providing renewable and secure electricity generation and storage.



Allocate €20 billion within the Multiannual Financial Framework (MFF) for biodiversity-integrated renewable energy sources (RES) and grid light-house projects that prioritise sustainability and innovation.



When developing nature restoration plans under the recently adopted NRR, Member States must ensure synergies with RES projects and avoid adding obstacles to permitting procedures.



Increase EU funding to close knowledge gaps on the biodiversity impacts of RES and related electricity infrastructure, ensuring the development of effective and science-based mitigation measures.



Eurelectric's Power Plant 2.0 report [*A Guidebook to Electrify in Harmony with Nature*](#) outlines 12 key principles for integrating biodiversity into RES and grid projects, supported by case studies and practical recommendations.



References:

- ¹ European Environment Agency, WISE Water Framework Directive (data viewer): <https://www.eea.europa.eu/data-and-maps/dashboards/wise-wfd>;
- ² The Living Planet Index (LPI) for migratory freshwater fish – Technical Report (2020). World Fish Migration Foundation, The Netherlands.
- ³ European Commission, The Habitats Directive: [EUR-Lex - 01992L0043-20130701 - EN - EUR-Lex \(europa.eu\)](#);
- ⁴ European Commission, The Water Framework Directive: [Directive - 2000/60 - EN - Water Framework Directive - EUR-Lex \(europa.eu\)](#);
- ⁵ European Commission, Nature Restoration Regulation: [Regulation - EU - 2024/1991 - EN - EUR-Lex \(europa.eu\)](#)

Photo credits:

Background slide No 1-3: VERBUND

Project examples:

- Species conservation Spain – ENEL
- Jochenstein, Passau-Ingling, Schärding-Neuhaus – VERBUND
- Kühtai – TIWAG
- La Florida – EDP
- Marieberg – Uniper
- Romanche-Gavet – EDF
- Spjutmo, Blyberg, Väsa – Fortum
- Ottensheim-Wilhering – VERBUND

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