

REPowerEU revision of the Renewable Energy Directive and hydropower

Briefing paper

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The Commission's 'REPowerEU' package of initiatives presented in May 2022 including the proposal to further amend the EU Renewable Energy Directive (RED) has brought a timely response to the need to accelerate renewable energy deployment, through the setting of a higher EU renewable energy target and the designation of 'go-to areas' for renewable energy deployment. The package neither included specific initiatives related to hydropower, nor excluded hydropower from the scope of those initiatives. However, the EC proposals have already had some effect in driving hydropower deployment, with a number of Member States (and developers) either announcing new hydropower projects or trying to reintroduce some controversial ones ¹, including foreseeing public financing under Member States' recovery and resilience plans (RRPs).

However, a new hydropower boom is neither a desirable nor strategic approach to improve the EU's energy security [as has been advocated by more than 150 CSOs](#). Building new hydropower plants is an increasingly unreliable solution to produce electricity in the face of rising climate change impacts, as shown by sharp drops in hydroelectricity production in the summer 2022. These concerns come on top of the significant adverse environmental and social impacts of hydropower that also limit our resilience to climate crisis. Because of a combination of factors including cost models, climate projections, public acceptance, and impacts on biodiversity, NGO-led scenarios for achieving climate neutrality at EU² and national³ levels, foresee no further hydropower expansion across the EU.

Policy-makers in the European Parliament and Council should therefore:

- **Exclude new or revamped hydropower projects from the 'go-to areas' and streamlined permitting under the amended Renewable Energy Directive**
- Ensure that 'go-to areas' for other technologies⁴ exclude migratory corridors for freshwater and diadromous fish and, unless the renewable energy technology to be deployed is compatible with the planned nature protection and restoration, areas foreseen for nature restoration under the proposed Nature Restoration Law including free-flowing rivers;

¹ In Romania, hydropower projects on the Olt, Jiu and Siret rivers are [proposed by the Minister of Investments and European Projects](#). An approval was given on 4 October 2022 to [include the project on the Siret in a chapter of the NRRP](#) which will be renegotiated with the European Commission by the end of the year. The project on the Jiu river, located in a national park and N200 site, has been opposed by NGOs for several years and is particularly problematic from a biodiversity perspective. The national court of justice [issued a final decision in 2017](#) to invalidate the building permits issued without an environmental impact assessment or appropriate assessment, however, changes in national legislation have been passed through the Parliament in 2022 to declare hydropower projects as being of overriding public interest. The Constitutional Court is expected to take a decision with regards to these legislative changes in November 2022.

² [Building a Paris Agreement Compatible \(PAC\) energy scenario](#), CAN Europe/EEB technical summary of key elements, June 2020, pages 33-34

³ Such scenarios exist for instance for [Bulgaria](#) and [Hungary](#).

⁴ WWF asks for the [exclusion of environmentally sensitive areas](#) such as Natura 2000 sites, nature parks and reserves, identified bird and marine mammal migratory corridors, blue carbon ecosystems and in principle areas foreseen for nature restoration under the proposed Nature Restoration Law, including free-flowing rivers.

- Delete the general presumption of overriding public interest for all renewable energy projects, as, in the case of hydropower, this goes against the existing case law on the provisions of the Water Framework Directive and the Birds and Habitats Directives.

As a consequence, any amendments to the Recovery and Resilience Facility Regulation to integrate dedicated REPowerEU chapters in Member States' existing recovery and resilience plans (RRPs) should not prioritise any further investments in new or in revamped hydropower projects.

These recommendations complement a broader set of recommendations from the civil society organisations on the revision of the Renewable Energy Directive under the REPowerEU legislative proposal and specific guidance in relation to hydropower.⁵

Evidence to support the main policy recommendations:

What allowing new hydropower in go-to areas would mean

In the European Commission's proposal article 16(a) in RED, new applications for renewable energy plants in designated go-to areas (including the repowering of plants, storage facilities) will be exempted from the requirement to carry out an environmental impact assessment (EIA) under Article 2(1) of Directive 2011/92/EU as long as they fulfill certain conditions. The EIA directive imposes a mandatory EIA for hydropower schemes which include a reservoir above 10 million cubic meters,⁶ while for the small hydropower plants with reservoirs under this size or the run-of-river hydropower plants with little or no storage, the EIA is left to the discretion of Member States.⁷ Allowing new hydropower in go-to areas would mean that all hydropower schemes, even the ones with reservoirs >above 10 million cubic meters would be exempted from the obligation to go through an environmental impact assessment.

In addition, the European Commission has also proposed that new applications for renewable energy plants in designated go-to areas should not be submitted to an assessment of their implications for Natura 2000 sites. This is highly problematic with regards to hydropower, as the hydrological impacts of hydropower plants (reduced flows, hydropeaking) can often be observed hundreds of kilometers downstream, and could therefore affect Natura 2000 sites outside of go-to areas. Hydropower projects would also be approved automatically if the permitting authority fails to meet a specified deadline.

While the European Commission has proposed that go-to areas should not include Natura 2000 sites, nature parks and reserves, as well as the identified bird migratory routes (article 15c), their proposal does not exclude migratory corridors for freshwater or diadromous fish. This means that hydropower plants could be planned, with exemptions from EIA as described above, in rivers that are migratory routes for fish, with dramatic negative impacts on those species.

⁵ European Commission, [EU guidance on The requirements for hydropower in relation to Natura 2000](#).

⁶ "Dams and other installations designed for the holding back or permanent storage of water, where a new or additional amount of water held back or stored exceeds 10 million cubic metres." (annex I, EIA directive).

⁷ European Commission, [EU guidance on The requirements for hydropower in relation to Natura 2000](#), page 14.

Hydropower production will become more seasonally unreliable due to climate change

Several companies have reported significant losses in hydropower production during the summer of 2022 as a result of serious droughts. Enel's hydropower production during the summer 2022 was reported to be half of 2021 levels, while in general the hydropower output in Western Europe dropped 20 percent in the second quarter of 2022 compared to an average year.⁸ This episode could become recurrent as climate change is predicted to drive substantial changes in hydrology that can translate into risks for river ecosystems and hydropower. According to a recent WWF study, three EU countries, Spain, Bulgaria, and Portugal, are on the list of countries around the world with the most existing and projected hydropower dams at risk of water scarcity and damage to freshwater biodiversity.⁹

The impacts of climate change also mean that hydropower plant operators may more often fail to meet environmental requirements such as minimum ecological flows or functionality of the fish passes.

Member States will be unevenly impacted by climate change, with more frequent and prolonged droughts predicted in Mediterranean and Balkan countries, while a country like Finland will on the contrary experience more overflows.¹⁰ While solutions might be found to balance those gaps through storage and a dispatch shift from summer to winter, they require high storage capacities and might not be feasible for countries with low reservoir capacities and high summer inflow drops such as Austria and Italy.

Hydropower expansion in Europe has reached its limits

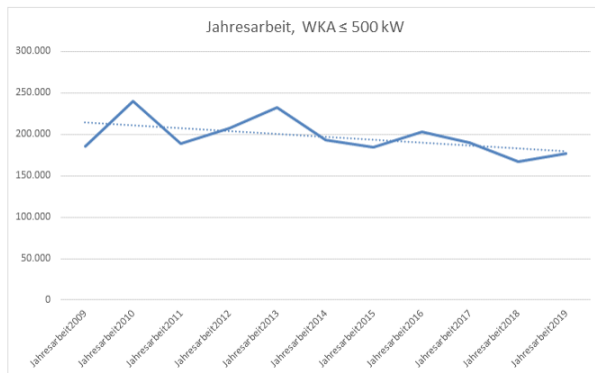


Figure 1: Hydropower production measured at 2400 German hydropower plants of a capacity 500kW, in kWh.

Hydropower plants have continued to be built in Europe enabled by the Renewable Energy Directive. 8,507 new plants were still planned in wider Europe in 2019, out of which 60% had an installed capacity <1MW and many of them only a few hundreds of kW¹¹ (in comparison, the average capacity of one single onshore windmill is 2.5-3 MW).

However, many of those small plants have seen a decrease in generation over the past years. In Germany, electricity produced by 2400 hydropower plants of a capacity <500 kW in the last 11 years (2009-2019) has decreased by 18 per cent (Figure 1).¹²

Despite the clear framework defined by the Water Framework and Birds and Habitats Directives, many of the hydropower plants planned or built in 2008-2022 have generated a significant amount of litigation at national

⁸ Politico, 9 August 2022.

⁹ Opperman, J.J.; Camargo, R.R.; Laporte-Bisquit, A.; Zarfl, C.; Morgan, A.J. [Using the WWF Water Risk Filter to Screen Existing and Projected Hydropower Projects for Climate and Biodiversity Risks](#). Water 2022, 14, 721.

¹⁰ Gøtske, E.K., Victoria, M. (2021) [Future operation of hydropower in Europe under high renewable penetration and climate change](#). iScience. 24, 102999.

¹¹ EuroNatur, GEOTA, RiverWatch, WWF, [Hydropower pressure on European rivers: The story in numbers](#), 2019.

¹² Answer of the Federal Government to a Small Question, Political Influence on the EEG 2021, Bundestag Printed Paper 19/29169, <https://dserver.bundestag.de/btd/19/291/1929169.pdf>

level and EU level, and recurrent public protests in several parts of Europe.¹³ As costs of new projects also go up due to their location in increasingly remote water bodies and higher environmental standards, their comparative advantage to other renewable energy sources is also debatable – and not in line with the intended purpose of “go-to” areas to facilitate and accelerate the deployment of renewables and to streamline permitting in clear cut cases.

Hydropower impacts on biodiversity can be mitigated but not avoided

A recent study conducted on a global dataset of more than 275,000 individual fish from 75 species at 122 hydropower sites of varying sizes showed that on average 22% of all passing fish suffer from lethal injuries and kills in hydropower turbines, because of inadequate protective devices and lack of safe downstream migration routes at hydropower plants.¹⁴ This mortality rate increases when taking into account the cumulative impacts of multiple hydropower plants on the same river system. The negative environmental consequences of energy production from hydropower plants can be mitigated by measures such as habitat improvement, fish protection devices on turbines, fishways to allow bypassing the turbines or even interruptions of production during migration period, but they cannot be avoided. Even hydropower plants equipped with the best fish protection schemes have negative impacts on river ecosystems related to for instance interrupted sediment transport or alterations of the flow regime.

The decline in freshwater biodiversity in Europe is significant

Freshwater species populations have seen the greatest overall global decline (83%), and within this species group, on average, monitored migratory fish populations have declined by 76% between 1970 and 2016 globally, but as much as 93% in Europe, making our continent the most affected.¹⁵

In Europe, all 8 sturgeon species are endangered and the latest update of the IUCN Red list declared the ship sturgeon extinct in the Danube, with the excessive fragmentation of rivers as one of the main causes.¹⁶

Hydropower is not climate neutral

Reservoirs in dammed rivers emit considerable amounts of methane even in European latitudes, as a result of organic matter accumulating in upstream reservoirs, with consequences for both the climate and aquatic environment.¹⁷

In addition, recent studies have shown that hydropower plants with large reservoirs suffer from an “albedo-penalty”. This term coins the fact that the positive contribution of hydropower plants to climate change mitigation compared to other energy sources is partially offset by the fact that hydropower reservoirs absorb large quantities of sunlight, resulting in a low surface albedo (the reflected solar radiation). This low albedo results in a positive radiative forcing at the top of the atmosphere, which aggravates climate change effects.¹⁸

¹³ For instance, two campaigns have been held in Slovakia in 2015 and 2020 to protest against plans to build a small hydropower plant on the Hron River, involving fishermen, local people and mayors. The [second campaign](#) was supported by the Minister of the Environment himself.

¹⁴ Radinger, J., van Treeck, R. & Wolter, C. (2022) [Evident but context-dependent mortality of fish passing hydroelectric turbines](#). Conservation Biology.

¹⁵ WWF (2022) [Living Planet Report 2022 – Building a nature positive society](#). Almond, R.E.A., Grooten, M., Juffe Bignoli, D. & Petersen, T. (Eds). WWF, Gland, Switzerland.

¹⁶ [Update of the IUCN red list](#), 21 July 2022.

¹⁷ Wilkinson, J., Bodmer, P., Lorke, A. (2019) [Methane dynamics and thermal response in impoundments of the Rhine River, Germany](#). Sci. Total Environ. 659, 1045-1057.

¹⁸ Wohlfahrt, G., Tomelleri, E. & Hammerle, A. [The albedo-climate penalty of hydropower reservoirs](#). Nat Energy 6, 372–377 (2021).

River Basin Management Plans should be the main planning instrument guiding hydropower sustainability

A separate approach introduced by amended RED would most likely undermine the well-established objectives as well as planning procedures under the Water Framework Directive and Birds and Habitats Directives in relation to hydropower including a significant body of guidance for Member States and stakeholders (e.g. [EU guidance on The requirements for hydropower in relation to Natura 2000](#) developed in that context).

Overriding public interest of hydropower must be assessed on a case-by-case basis

In the framework of the Common Implementation Strategy (CIS) of the Water Framework Directive it was agreed in 2011 that hydropower is not automatically of overriding public interest just because it generates renewable energy.¹⁹ In the Judgment of 4 May 2016, *Commission v Austria*, Case C-346-14, the Court of Justice of the EU ruled that Austria was allowed a margin of discretion to determine that the construction of the Schwarze Sulm hydropower was of overriding public interest compared to the negative impact of the hydropower project, but indicated that the concept “overriding public interest” requires detailed and specific analysis linked to the site-specific circumstances of the concerned body of water.²⁰

A study conducted in North-Rhine Westphalia showed that the "public interest" of hydropower is neither scientifically nor politically valid as the potential of hydropower in North-Rhine Westphalia is practically exhausted, energy generation from hydropower in the region will decrease in the long term due to climate change, and the negative consequences of hydropower cannot be offset.²¹ This confirms the common understanding agreed under the WFD CIS that overriding public interest for hydropower is not automatic, and must be determined on a case-by-case basis. In the judgment of 20 May 2020 (No. 6Szk/14/2019), the Supreme Court of the Slovak Republic stated: The public interest in protecting and preserving the environment takes precedence over the private interest in the potential production of electricity from a small hydropower plant.

We therefore urge EU policymakers to take on board these recommendations when debating the RED revision, to make REPowerEU an instrument that paves the way to win-win renewable energy deployment solutions which reduce greenhouse gas emissions while protecting and enhancing the EU's ecosystems, in line with the broader EU Green Deal objectives.



¹⁹ [Water management, Water Framework Directive & Hydropower](#), Common Implementation Strategy Workshop Brussels, 13-14 September 2011, Issue Paper, Recommendation n°24.

²⁰ Henrik Josefsson, Victoria Viklund, [Legal study of the abusive use of exemptions to the Water Framework Directive in Sweden](#), May 2022.

²¹ Ingendahl, D., Borchering, J., [Zur Bedeutung der Wasserkraft und ihren Auswirkungen auf die Gewässer ökologie am Beispiel von Nordrhein Westfalen](#), Wasser und Abfall, February 2022