

Hydropower plants in the Western Balkans: Protecting or destroying nature?

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Abstract: *Urgent action is needed to save humanity from the consequences of global warming. The energy sector, especially coal-fired power plants in the Western Balkans, are amongst the worst polluters and contributors to CO2 emissions in Europe, therefore the switch to renewables is essential. Hydropower was seen as an attractive replacement with 3,000 hydropower plants (HPPs) planned between Slovenia and Turkey. However, with most of these earmarked for protected natural areas, the resulting damage to the environment, especially to fragile river ecosystems and dependent biodiversity, is hugely disproportionate to investment, particularly given HPPs' negligible contribution to electricity production and lack of benefits for local communities. Activists and scientists across the Balkans have succeeded to some extent in highlighting the negative impact of HPPs. However, governments in the region must do more to diversify into alternative renewable energy sources and to protect nature for future generations.*

Keywords: *small hydropower plants; Western Balkans; environmental rights; renewable energy*

1. Introduction

Energy production from renewable sources (water, wind and sun) is considered one of the best ways to reduce the effects of global warming, given that electricity production from coal-fired power plants is one of the largest contributors to CO2 emissions in Europe. With the current energy crisis and more visible effects of global warming, the shift to renewable energy is even more crucial. However, renewable energy development has raised questions regarding sufficient protection of environmental rights. This article focuses on the impact of HPPs, especially in the Balkan region which has seen a boom in small hydropower plant (SHPP) construction

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in the past decade. It analyses numerous studies and reports of relevant international institutions, such as the European Commission and the Standing Committee for the Bern Convention on the Conservation of European Wildlife and Natural Habitats. Furthermore, it reviews the numerous activist undertakings to protect the Balkan wild rivers and discusses viable environmentally friendly alternatives to hydropower.

2. Global warming – preventive measures must be taken

Growth and development of the energy industry, burning fossil fuels, cutting down forests and farming livestock are increasingly raising Earth's temperature, adding enormous amounts of greenhouse gases to those already occurring naturally (Europe Commission n.d.). The 2011-2020 decade was the hottest on record, with average global temperatures 1.1°C above pre-industrial levels (before 1750) in 2019. Since a 2°C rise is associated with serious negative impacts on the natural environment and human health and wellbeing, including a much higher risk that dangerous and possibly catastrophic changes in the global environment will occur, the international community has recognised the need to pursue efforts to limit it to 1.5°C (European Commission n.d.).

The European Green Deal has set the target of transforming the European Union (EU) to climate-neutrality by 2050, ensuring an economy with net-zero greenhouse gas emissions. In order to achieve this ambitious goal, the EU aims to reduce net greenhouse gas emissions by at least 55 percent by 2030, compared to 1990 levels (Europe Commission n.d.). As one of the principles for clean energy transition, the European Green Deal envisages developing a power sector based largely on renewable sources (European Commission n.d.).

Greenhouse gas emissions are directly responsible for climate change and global warming and thus extremely harmful to the environment and human health (Pavlovič et al 2022, 2). CO₂ produced by human activities is the largest contributor to global warming. By 2020, its concentration in the atmosphere had risen to 48 percent above its pre-industrial level (before 1750) (European Commission n.d.). The energy sector is one of the largest polluters and accounts for more than 75 percent of the EU's greenhouse gas emissions (European Commission n.d.).

Burning coal, oil and gases are amongst the largest contributors to greenhouse gas emissions. Power plants and terminal power plants emitted 24 percent of total gas pollution and 29 percent of CO₂ emissions in 2015 (Pavlovič et al 2022, 2). Terminal (coal-fired) power plants in the

Western Balkans are considered some of the biggest polluters in Europe, with emissions 20 times more CO₂ and 16 times more particulate matter than the average European power plant (Pavlović et al 2022, 3).

3. Hydropower - a nature-friendly resource?

For many years, water has been considered a viable renewable energy source. However, construction and functioning of HPPs has brought controversy. The Western Balkans is home to some of the last wild rivers in Europe, full of diverse and protected flora and fauna. Around 3,000 HPPs are currently planned between Slovenia and Turkey (RiverWatch n.d.).

Electricity production from SHPPs in the Western Balkans began in the mid-1990s but increased dramatically when the EU set renewable energy production targets for 2010 and started financing such projects. In 2009-2020, 490 SHPPs were built in Western Balkans countries (EuroNatur and RiverWatch 2022). Moreover, 2018 data shows that as much as 70 percent of EU renewable energy funding has been used for SHPP construction in the region (Pavlović et al. 2022, 4).

SHPP refers to hydroelectric power plants below 10MW installed capacity. To enable these to function, water is diverted from a river at an intake weir upstream and channelled through a pipe to the powerhouse containing the turbines downstream. The height difference is used to induce kinetic energy in the water which is then transformed into electricity. After passing through the powerhouse, a smaller amount of used water, just enough to ensure the biological minimum, is returned to the section of river in between the powerhouse and intake weir (Vejnovic 2017, 8).

Construction of SHPPs has proven a very invasive process for nature, firstly through interference with the terrain by cutting trees and permanent ground damage where the pipes pass through, and further by endangering water supply for local communities as well as the biodiversity and ecosystems dependent on natural river flow. River flow reduction decreases oxygen levels in the water crucial for river flora and fauna. Insufficient riverbed water levels significantly lower the chances of survival of the *Salmonidae* fish family, which swim upstream to spawn, and other dependent species. Moreover, lack of water inhibits the functioning of fish farms which use the natural river flow to supply fish pools with necessary oxygen. The projects envisage construction of fish passes which supposedly mitigate impact of weirs and intakes on fish migration (Vejnovic 2017, 9-10). However, in practice these are not functional, due to the shortage of water needed

for fish to migrate upstream or improper construction¹. Furthermore, the insufficient control over the functioning of the SHPPs built in the National Park Pelister² caused deterioration of amphibian habitats due to lack of providing ecological minimum of water especially in the spring period when it is their main reproductive season (National Park Pelister et al. 2020, 122).

The impact of HPP construction in the Western Balkans and surrounding controversy has been the focus of much research (Balkan Rivers n.d.). A 2015 study found that in the Western Balkan countries, 535 projects were earmarked for strictly protected areas while a further 282 were scheduled to be built inside areas with weaker protection status, all exploiting and endangering nature reserves rich in flora and fauna (Schwarz 2015, 10). In 2017, Bankwatch investigated the effects of EU-financed SHPPs by examining eight sites in the region; two in Albania, one in Croatia and five in North Macedonia, all located in protected or ecologically sensitive areas (Vejnovic 2017). The report concluded that only the Croatian plant had undertaken appropriate biodiversity impact assessment, however, all the plants inspected required increased impact monitoring and restoration measures (Vejnovic 2017).

Furthermore, most HPPs were labelled as small even though they significantly impacted a sizable area of land and had not undergone full environmental impact assessment (EIA). Even in the cases where an EIA is done, it is rarely conducted in accordance with the EU EIA Directive and evaluation of cumulative impact is often missing. According to the report, the countries used an approach allowed by the EU EIA Directive, enabling national authorities to decide whether an EIA is necessary, depending on project classification, even though some of the projects were located within protected areas (for example the Legarica HPP in Albania) (Vejnovic 2017). Challenges obtaining the studies for the HPPs subject to the report were also noted and the research revealed significant violations of national and international financial institutions' standards (Vejnovic 2017). For instance, in Albania, the client redirected water from his project to another SHPP further downstream, resulting in 4.3km of riverbed drying up, but these details were omitted from plans approved by the bank (Vejnovic 2017).

1 For illustration, on the Brajcinska river, North Macedonia (National Park Pelister) intake, close examination shows the fish pass upstream entrance is inadequate, while the upstream exit is blocked, while on the Kriva Kobila river intake (North Macedonia), the fish pass upstream entrance is inappropriate, and the upstream exit is again blocked (Vejnovic, 2017).

2 Four SHPPs have been built in the National park "Pelister", North Macedonia – two on the river Shemnica and two on Brajcinska river. The SHPPs have been built without consultation with the National Park Pelister (National Park Pelister et al. 2020, 43).

In 2021, the State Audit Office of North Macedonia published a report on “Exploitation of Water Resources in Electricity Production for the period of 2012-2021”: it disclosed that by the end of 2020, 117 HPPs had been constructed in the state, eight of which are large HPPs, 13 SHPPs which are not subsidised electricity producers and 96 subsidised electricity producers. According to the report, public consultations for 61 percent of SHPPs awarded concessions to produce energy were published prior to adoption of strategic documents which would have ensured higher environmental protection standards. Moreover, environmental protection approval was completed without proper estimation of potential environmental impact, meaning almost certain damage to river ecosystems and natural biodiversity. The report states that the procedures for granting concessions for SHPP construction and water use were also carried out without EIA. Some concessions were awarded based on outdated hydrological data (State Audit Office of North Macedonia 2021a, 5). The State Audit also found that weaknesses in permit issuing procedure and inefficient control by the competent institutions enabled use of water in certain periods without a proper permit (State Audit Office of North Macedonia 2021a, 5).

According to the report, those awarded concessions are guaranteed purchase of the entire production of electricity at preferential tariffs set by law, thus in the period of 2012-2021, they were paid 41m euros more than the market value of the electricity produced, which was just 4 percent of total domestic electricity production in 2020 (State Audit Office of North Macedonia 2021a, 5). SHPP electricity production in other Western Balkan countries is also insignificant and disproportionate to the investment in their construction and permanent damage to nature. In 2021, SHPPs generated 2.5 percent of electricity in Bosnia and Herzegovina (State Electricity Regulatory Commission 2021, 38), 4.1 percent in Montenegro and a mere 0.1 percent in Serbia (Elektroprivreda Srbije n.d.).

SHPP functioning is financed through feed-in tariffs: thus, citizens subsidise state purchase of SHPP-produced electricity through their electricity bills. In the case of North Macedonia, 6 percent of every electricity bill pays for energy produced by subsidised producers (Institute for Communication Studies n.d.). Yet communities do not benefit by getting their electricity from local SHPPs.

The European Commission has also acknowledged concerns about SHPPs in recent reports. The Commission praised Serbia’s new ban on building SHPPs in protected areas but felt this should be widened to include procedure on appropriate assessment of the ecological network (European

Commission 2022f). The Commission also noted that the Montenegro government withdrew concessions for several SHPPs, however continued with plans for larger ones. The Commission emphasised and reiterated its findings from the 2021 EU Report that is essential that the development of new renewable energy projects, particularly on hydropower, are carried out in conformity with the EU *acquis* on concessions, State aid and the environment. and to ensure public participation and consultation and guarantee high quality EIA reports that include cumulative effects on nature and biodiversity (European Commission 2021c and European Commission 2022d).

In its 2021 and 2022 reports on Albania, the Commission stated that SHPPs had significant negative impact on local biodiversity and communities, notably in protected areas where around 20 percent of more than 500 SHPPs are located or planned. It also noted that HPPs have generated much debate, protests and court action, casting doubts on legality of the concession process and on quality and validity of EIAs. The Commission highlighted that no strategic environmental assessments (SEAs) have been conducted despite cumulative effects on river basins. It stressed that hydropower investment should strictly comply with national and international environmental, nature protection and water management standards, involve proper public participation and consultations, and be subject of SEA and EIA reports that include high quality assessments of the cumulative impact on nature and biodiversity. The Commission found that SEAs are lacking despite the high number of existing and planned hydropower installations in all river basins, emphasising that they should be conducted before any licence is granted. Inspection and monitoring of the minimum ecological flow from current HPPs is also lacking. The Commission called on Albania to take immediate measures to review and improve SEAs and EIAs on existing and planned projects, plans and programmes and to continue diversifying electricity production away from hydropower towards solar and wind resources (European Commission 2021a and European Commission 2022b). It further noted that the HPP Skavica is expected to have a large environmental and socio-economic impact on the area and impact the Balkan lynx populations that use this corridor for migration between Albania and North Macedonia. It was called upon the authorities to bring adequate attention to the project design and EIA quality to minimise these impacts, as well as to implement the obligatory planting and restoration of road slopes, having in consideration that no wildlife crossing has been planned and implemented in Albania (European Commission 2022b).

In the case of North Macedonia, the Commission noted that energy law is moderately aligned with the Renewables Energy Directive, and it again stressed that hydropower investment must comply with the relevant environmental EU acquis (European Commission 2022e).

Meanwhile, in its 2021 recommendations, the Standing Committee for the Bern Convention on the Conservation of European Wildlife and Natural Habitats called on the North Macedonia government to suspend and cancel approved concessions and those planned for construction, to ban HPPs in national parks, protected areas and implement the new international standards on HPP prohibition in World Heritage Sites. The Committee also called for due diligence for protected areas, proposed protected areas and corridors between these as well as the prevention of excessive water withdrawal from streams within or impacting upon Mavrovo National Park, other protected areas, World Heritage Sites and Emerald candidate areas (Council of Europe Standing Committee 2021).

4. Protecting nature through activism

Neither leading scientists nor local communities in the Western Balkans have welcomed HPPs. International campaigns, such as Save the Blue Heart of Europe and Vjosa National Park Now, aim to raise awareness of their negative impact, stop construction and protect the last wild rivers in Europe. Many studies and short films document local community action in the region, and in the case of the Vjosa river in Albania, explain the risk of damage to this biodiversity hotspot. A total of 113 endangered fish species inhabit the rivers between Slovenia and Greece – more than in any other region in Europe (Weiss et al 2018), including the Prespa trout endemic to the Balkans.

In all the Western Balkan countries, local people and non-governmental organisations have launched petitions and staged massive protests and blockades which have gained wide support. In Serbia, various demonstrations have been staged over the past three years regarding the Stara Planina Park where, despite its protected status, the authorities granted permission for the construction of 60 SHPPs. More than 40 environmental protection groups participated in these protests. In August 2020, activists even broke through a pipe set up during SHPP construction on the river Rakita (Balkan Rivers 2020). Protests also took place in North Macedonia after the government planned to build dams and HPPs in the National Park Mavrovo, home of the Balkan lynx, one of Europe's most endangered mammals. Recent reports noted that only 10 lynxes were seen in Kosovo, Albania and North Macedonia over a four-month period

(Ranocchiaro 2022). Despite this, four SHPPs have been built in the park so far, another four in the National Park Pelister and the state has issued permits for others. The “Brave Women of Kruščica” in Bosnia and Herzegovina defied police intimidation to block a bridge, the only route suitable for transporting heavy machinery to the construction site, for more than 500 days, to prevent a SHPP being built on the river Kruščica, a protected area which provides drinking water for the local communities.

These initiatives have been partially successful. Serbian activists succeeded in stopping construction of 57 HPPs and managed to convince the authorities of the importance of saving the environment. In 2022 the Serbian government initiated a procedure to establish a National Park Stara Planina, giving the region better protection and preserving the wild mountain rivers. Through grassroots activism and using international legal mechanisms by submitting a complaint to the Bern Convention on the Conservation of European Wildlife and Natural Habitats, activists managed to cut off the financial lifeline for the hydropower projects, prevent construction of two dams in the National Park Mavrovo and protect the Balkan lynx’s habitat to some degree and campaign leader Colovic Lesoska received the 2019 Goldman Environmental Prize (Goldman Prize n.d.). However, in 2022, the Government of North Macedonia extended the deadline for some HPP permits when construction did not begin on time. The “Brave Women of Kruščica” were awarded the 2019 EuroNatur Award and the 2021 Goldman Environmental Prize (EuroNatur 2019; Goldman Prize n.d.). Moreover, in July 2022, the Parliament of Federation of Bosnia and Herzegovina responded positively to public opinion by adopting legislative changes forbidding SHPP construction on Federation territory (Al Jazeera Balkans 2022). The Vjosa river campaign has also borne fruit when in June 2022 the Albanian government signed a memorandum establishing a Vjosa Wild River National Park which will protect the entire river network from the Greek border to the Adriatic Sea, including its free-flowing tributaries. More is needed to establish the National Park, but this memorandum is the first and crucial step (Balkan Rivers 2022).

The wide support of citizens, NGOs, scientists and relevant international institutions and organisations have significantly influenced state politics regarding further construction of the SHPPs in the Western Balkans.

5. Is there a better alternative?

Despite the aforementioned victories, the impact and irreversible damage to nature caused by existing HPPs is an ongoing concern. Furthermore, many concessions have already been awarded, some without full EIA,

while for others the deadlines have even been extended. Further damage to nature and ecosystems dependent on natural river flows remains a real risk. The European Commission and the Standing Committee for the Bern Convention findings are just another confirmation of the negative impact and the issues relating to Western Balkans HPPs. There is an undoubted need to transform the energy sector by producing electricity from renewable sources. However, preserving nature and fragile ecosystems must also be a priority, especially as the energy sector is being transformed primarily to prevent global warming, thus protecting nature. Less invasive energy sources, for example, wind and sun could be good alternatives. The Western Balkans Investment Framework is financing construction of three photovoltaic power plants. One in Albania is a floating solar photovoltaic power plant at a HPP reservoir, while those in North Macedonia will be installed on an exhausted coal mines site, adjacent to the coal-fired thermal power plant (WBIF 2022). One of the North Macedonian installations has been operational since April 2022 (21Tv 2022). Nevertheless, caution is needed in their implementation. As ground-mounted photovoltaics and concentrating solar-thermal power installations require land, sites need to be selected, designed, and managed to minimise impact to local wildlife, wildlife habitat, and soil and water resources (Office of Energy Efficiency & Renewable Energy n.d.). A serious approach to the issuing and implementation of permits is vital, avoiding any manipulation and controversy that could lead to new damage to nature, as was the case with SHPPs.

With the impact of global warming becoming more visible every year, action to reduce CO₂ emissions is vital. The EU goal of climate neutrality by 2050 is a great motivator to shift the energy sector away from fossil fuels toward renewables. However, the huge push for HPP construction in the Western Balkans has been mired in controversy; from irregularities in their financing and environmental assessment planning to their irreversible damage to nature, particularly fragile river ecosystems, endangering native flora, fauna and wildlife, their negligible contribution to electricity production and lack of benefit to local people. Grassroots activism across the whole region has helped protect some of the last wild rivers in Europe, but governments must take decisive action to save the environment by halting construction of new SHPPs and discontinuing use of existing ones. The need for transformation of the energy sector should be met by more environmentally friendly resources, because trying to combat global warming by causing irreversible damage to nature is a contradiction in terms.

References

- 21Tv. 2022. "Kovachevski: with the photovoltaic power plant 'Osloney' to energy independence through renewable sources." (orig. "Ковачевски: Со фотонапонската електрана 'Осломеј' до енергетска независност преку обновливи извори на енергија"). April 6, 2022. [Link](#) (last visited 22 November 2022).
- Al Jazeera Balkans. 2022. "Ban voted on construction of small hydropower plants in the Federation of Bosnia and Herzegovina." (orig. "Izglasana zabrana izgradnje mini hidroelektrana u FBiH"). July 7, 2022. [Link](#) (last visited 22 November 2022)
- Balkan Rivers. n.d. "Studies." [Link](#) (last visited 22 November 2022)
- Balkan Rivers. 2020. "Civil disobedience: Activists remove pipes of illegal hydropower plant in Serbia!" August 17, 2020. [Link](#) (last visited 22 November 2022)
- Balkan Rivers. 2022. "Albanian Government signs commitment to establish a Vjosa Wild River National Park." June 13, 2022. [Link](#) (last visited 22 November 2022)
- Council of Europe Standing Committee. 2021. Recommendation No. 211(2021) on conservation measures within national parks in North Macedonia, including in relation to Mavrovo National Park and Lake Ohrid and Galichica National Park. December 3, 2021. [Link](#) (last visited 22 November 2022)
- Elektroprivreda Srbije n.d. "Hidroelektrane." [Link](#) (last visited 22 November 2022)
- EuroNatur and RiverWatch. 2022. "Cutting hydropower subsidies – how are the Western Balkans doing?" [Link](#) (last visited 22 November 2022)
- EuroNatur. 2019. "Brave women of Krušćica' receive EuroNatur Award 2019." September 10, 2019. [Link](#) (last visited 22 November 2022)
- European Commission n.d. "A European Green Deal - striving to be the first climate-neutral continent." [Link](#) (last visited 22 November 2022)
- European Commission n.d. "Causes of climate change." [Link](#) (last visited 22 November 2022)
- European Commission. n.d. "Energy and the Green Deal." [Link](#) (last visited 22 November 2022)
- European Commission. 2021a. Albania 2021 Report. October 19, 2021. [Link](#) (last visited 22 November 2022)
- European Commission. 2021c. Montenegro 2021 Report. October 19, 2021. [Link](#) (last visited 22 November 2022)
- European Commission. 2022b. Albania 2022 Report. October 12, 2022. [Link](#) (last visited 22 November 2022)
- European Commission. 2022d. Montenegro 2022 Report. October 12, 2022. [Link](#) (last visited 22 November 2022)

- European Commission. 2022e. North Macedonia 2022 Report. October 12, 2022. [Link](#) (last visited 22 November 2022)
- European Commission. 2022f. Serbia 2022 Report. October 12, 2022. [Link](#) (last visited 22 November 2022)
- European Commission Environmental Impact Assessment Directive (85/337/EEC). [Link](#) (last visited 22 November 2022)
- Goldman Prize. n.d. “2021 Goldman Prize Winner - Maida Bilal.” [Link](#) (last visited 22 November 2022)
- Goldman Prize. n.d. “2019 Goldman Prize Winner Ana Colovic Lesoska.” [Link](#) (last visited 22 November 2022)
- Institute for Communication Studies. n.d. “Millionaires at our expense.” (orig. “Милионери на наша сметка”). [Link](#) (last visited 22 November 2022)
- Office of Energy Efficiency & Renewable Energy. n.d. “Solar Energy, Wildlife, and the Environment.” [Link](#) (last visited 22 November 2022)
- National Park Pelister, DEKONS-EMA and Makedosko ekolosko drushtvo. 2020. “2021-2030 Pelister National Park Management Plan” (План за управување со Националниот парк Пелистер 2021-2030). November 2020. [Link](#) (last visited 20 December 2022)
- Pavlovič, Barbara, Andrea Okanovic, Bojana Vasić, Jelena Jesic and Polona Šprajc. 2022. “Small hydropower plants in Western Balkan countries: status, controversies and a proposed model for decision making.” *Energy, Sustainability and Society* 12. [Link](#) (last visited 21 November 2022)
- Ranocchiaro, Marco. 2022. “We are losing the Balkan lynx.” *Osservatorio Balcani e Caucaso Transeuropa*, February 1, 2022. [Link](#) (last visited 22 November 2022)
- RiverWatch. n.d. “The Balkan Rivers: Save the Blue Heart of Europe.” [Link](#) (last visited 22 November 2022)
- Schwarz, Ulrich. 2015. “Hydropower projects in protected areas on the Balkans.” RiverWatch & EuroNatur. May 2015. [Link](#) (last visited 22 November 2022)
- State Audit Office of North Macedonia. 2021a. “Exploitation of water resources in electricity production for the period of 2012-2021.” October 2021. [Link](#) (last visited 22 November 2022)
- State Audit Office of North Macedonia. 2021b. Press release. December 20, 2021. [Link](#) (last visited 22 November 2022)
- State Electricity Regulatory Commission of Bosnia and Herzegovina. 2021. “Report on activities of the state Electricity Regulatory Commission in 2021.” December 2021. [Link](#) (last visited 22 November 2022)
- Vejnovic, Igor. 2017. “Broken rivers: The impacts of European-financed small hydropower plants on pristine Balkan landscapes.” Bankwatch Network. December 2017. [Link](#) (last visited 22 November 2022)

Weiss, Steven, Apostolos Apostolou, Samir Đug, Zoran Marčić, M Mušović, Anthi Oikonomou, Spase Shumka, Rifat Škrijelj, Predrag Simonović, A Vesnić and Daša Zabic. 2018. "Endangered fish species in Balkan Rivers: their distributions and threats from hydropower development." *Riverwatch & EuroNatur*. February 2018. [Link](#) (last visited 23 November 2022)

WBIF (Western Balkans Investment Framework). 2022. "Endorsed flagship projects." [Link](#) (last visited 23 November 2022)