Western Balkans Investment Framework WBIF

EXECUTIVE SUMMARY

REGIONAL STRATEGY FOR SUSTAINABLE HYDROPOWER DEVELOPMENT

This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of the Infrastructure Project Facility 7 and Infrastructure Project Facility 3 consortia and can in no way be taken to reflect the views of the European Union.

CONTENTS

Version: Final, 21/02/2019

ABBREVIATIONS AND ACRONYMS

ALB Acronym used for Albania

BiH Acronym used for Bosnia and Herzegovina

CBA Cost Benefit Analysis

CIA Cumulative Impact Assessment

CSO Civil Society Organisation

DG NEAR Directorate-General for Neighbourhood and Enlargement Negotiations

DSO Distribution system operator

EAF Ecologically Acceptable Flow

EC European Commission

ECS Energy Community Secretariat

EIA Environmental Impact Assessment

EnC Energy Community

ESIA Environmental and Social Impact Assessment

EU European Union

HPP Hydropower plant

IFI International Financing Institution

IPF Infrastructure Project Facility

IWRM Integrated Water Resource Management

MKD Acronym used for the Republic of North Macedonia

MNE Acronym used for Montenegro

NGO Non-governmental organisation

NREAP National Renewable Energy Action Plan

RES Renewable energy source

REV Reversible HPP

SEA Strategic Environmental Assessment

SER Acronym used for Serbia

SHPP Small hydro power plant

TA Technical Assistance

UNECE United Nations Economic Commission for Europe

WBIF Western Balkans Investment Framework

WB Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, North Macedonia, and Serbia

WFD Water Framework Directive (Directive 2000/60/EC)

* This designation is without prejudice to position on status, and is in line with UN Security Council Resolution 1244/99 and the International Court of Justice Opinion on the Kosovo declaration of independence.

INTRODUCTION

The Western Balkans have a strong tradition of hydropower development. As of December 2016, existing hydropower plants account for 8,605 MW of installed capacity, which represents 49.2% of all power generation capacities and 96.4% of total renewable energy sources (RES-E) capacities (e.g. solar, wind, hydro, biomass).[1]

90% of the region's capacity was built before 1990, out of which 10% was commissioned prior to 1955. Infrastructures are aging and at risk if not properly maintained. Rehabilitating existing structures is thus crucial to safeguard the present contribution that hydropower makes to the region's energy mix, as well as to improve environmental conditions.

Within this context and given the scarcity of data and studies which would investigate the hydropower potential of the region with a view to sustainably developing it, a study was suggested in March 2016, at a meeting of Western Balkan Energy and Transport Ministers, and included in the Declaration of the 2016 Western Balkans Summit in Paris.

The study commenced in May 2016 and comprised a series of reports and background data on the hydropower sector in the Western Balkans (the 'Study'), which would contribute to the development of a Regional Strategy for Sustainable Hydropower Development.[2]

Hydropower is renewable energy source, but can have large, negative impacts on the environment. The uniqueness of the region, in terms of nature and biodiversity, imposes an additional obligation on all partners to preserve the environment. Recent changes in climate, particularly rainfall, patterns, as well as the fact that rivers in the region constitute a shared resource, often associated with competing uses, constitute additional factors that need to be considered in any sustainable hydropower development plans. This Study articulated the challenge and provided recommendations on next steps.

Existing Large Hydropower Plants – Rehabilitation

Investments in the rehabilitation of existing, aging hydropower plants are needed in order to safeguard current electricity generation capacities and to enable the continuation of their service. Moreover, rehabilitation provides a good opportunity to implement additional environmental improvement measures that were often not considered at the time the plants were built and which may be required as the Western Balkans progress with EU accession negotiations.

The rehabilitation of existing HPPs has been clearly recognised as a priority by all relevant beneficiaries and stakeholders. A list of priority rehabilitation projects has thus been identified and may be found on page 11.

Large Hydropower Plants – State of Play of Greenfield Projects

480 large hydropower plants (mostly >10 MW), in various stages of development, have been identified during the course of this Study. 136 HPP projects with minimum available data have been selected for detailed assessment.

Out of the 136 project, 45 have been selected for a more detailed review. These may be found on page 12.

The list of 45 projects does not indicate which hydropower project should be built. It includes two categories:

- Greenfield projects which do not face serious bottlenecks;
- Greenfield projects which face serious bottlenecks (e.g. litigations) or environmental and social concerns.

The list also indicates the estimated investment costs and sensitive environmental and social aspects which should be duly considered in their development.

All hydropower projects on this list (and any future hydropower projects) should be subject to further exploration of the technical, financial, social and environmental feasibilities as well as to the further designation of Natura 2000 sites and no-go zones by WB so as to ensure that the projects are implemented with a minimal impact.

The **Principles for Sustainable Hydropower Development**, which complement this list, should therefore inform any future project preparation and implementation activities in this sector. These may be found on page 14.

1 According to International Energy Agency statistics.
2 All reports can be found at: https://www.wbif.eu/sectors/energy/sustainable-hydropower.

REGULATORY FRAMEWORK

As of November 2017, the WB are committed to joining the EU. The Republic of North Macedonia, Montenegro, Serbia and Albania have been granted Candidate Country status, while Bosnia and Herzegovina and Kosovo* have the status of Potential Candidates. Montenegro and Serbia have already started the accession negotiations and several of the chapters of the EU acquis have been opened.

In the context of this Study, the most relevant thematic areas are spread mainly over two Acquis Chapters: Chapter 15 on Energy, and Chapter 27 on Environment. These focus on water resources, energy, hydropower development, and environmental aspects, including climate change.

In September 2017, Commission President Jean-Claude Juncker stated, in his State of the Union address, that: "If we want more stability in our neighbourhood, then we must also maintain a credible enlargement perspective for the Western Balkans". To Serbia and Montenegro, as frontrunner candidates, the perspective was offered that they could be ready to join the EU by 2025. This perspective also applies to all WB.

This timeline corresponds to the period in which the projects recommended in the Study should be further prepared and, if feasible, implemented. Consequently, the WB should predicate their development of future hydropower projects on relevant EU acquis as well as international conventions to which they are party, such as the Energy Community Treaty, regardless of the actual status of EU acquis transposition into relevant legislation, source of financing, project size, etc.

Such relevant EU acquis and/or international agreements include:

- Renewable Energy (Renewable Energy Directive 2009/28/EC)
- Energy Efficiency Directives (2012/27/EU; 2010/30/EU; 2010/31/EU)
- Environmental Impact Assessment Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) and Strategic Environmental Assessment Directive (Directive 2001/42/EC)
- Water Framework Directive (Directive 2000/60/EC)
- Habitats Directive (Directive 92/43/EEC) & Birds Directive (Directive 2009/147/EC)
- Floods Directive (Directive 2007/60/EC)
- Paris Agreement on climate change
- Aarhus Convention (the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters)
- Espoo Convention (the UNECE Convention on Environmental Impact Assessment in a Transboundary Context)
- Berne Convention (the Berne Convention on the Conservation of European Wildlife and Natural Habitats).
- Electricity (Directive concerning common rules for the internal market in electricity (Directive 2009/72/EC); Regulation on conditions for access to the network for cross-border exchanges in electricity (Regulation (EC) 714/2009); Regulation on submission and publication of data in electricity markets (Regulation (EU) 543/2013))
- Security of supply (Directive concerning measures to safeguard security of electricity supply and infrastructure investment (Directive 2005/89/EC)
- Infrastructure (Regulation on guidelines for trans-European energy infrastructure (Regulation (EU) 347/2013)
- Energy Efficiency Directives (2012/27/EU; 2010/30/EU; 2010/31/EU)
- Renewable Energy (Renewable Energy Directive 2009/28/EC)
- EIA Directive (Directive 2011/92/EU, amended 2014/52/EU);
- SEA Directive (Directive 2001/42/EC);
- Birds Directive (Directive 79/409/EEC);
- Directive on environmental liability with regard to the prevention and remedying of environmental damage (Directive 2004/35/EC as amended by Directive 2006/21/EC, Directive 2009/31/EC)
- Large Combustion Plants Directive 2001/80/EC.

* This designation is without prejudice to position on status, and is in line with UN Security Council Resolution 1244/99 and the International Court of Justice Opinion on the Kosovo declaration of independence.

SOFT MEASURES

The following constitute recommendations for further actions which would ensure the sustainability of investments in hydropower plant rehabilitation and greenfield projects. They are based on the conclusions of the Study with regard to historical and current practices in this sector in the region, WB commitments, and international and regional best practices. These recommendations are complemented by a set of regional soft measures, included in the Study's Final Report.

1. WB are candidates or potential candidates and are hence committed to transposing and implementing the EU legislation. Of particular importance in this case is the Water Framework Directive (Directive 200/60/EC), which requires the development of river basin management plans. Such plans represent an essential step in the planning and implementation of integrated water resources management (IWRM) systems. The IWRM promote the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner, without compromising the sustainability of vital ecosystems. Upstream and downstream interactions with water resources are carefully considered, beyond administrative and political boundaries, and stakeholder engagement and participation are essential. The **WB should therefore seek to transpose and abide by Water Framework Directive (WFD) provisions and associated guidance. The same applies to EU acquis and/or international agreements listed in the first section of this Report.**

2. Article 4(7) in WFD is of particular relevance to hydropower investments as these regularly entail "new modifications to the physical characteristics of a surface water body or alterations to the level of groundwater". A planned hydropower project may cause the deterioration of the current status of a water body. **An assessment has to be undertaken in advance about the expected effects on water body status.** If deterioration is expected, then the project can only go ahead in case the conditions as outlined in Article 4(7) of WFD are met. It should be noted that the size of the project is not a relevant criterion whether Article 4(7) is triggered since also small projects may cause deterioration. Thus, projects of any size may fall under Article 4(7) and would have to meet specific conditions such as: all practicable mitigation measures are taken to reduce the environmental impacts; the benefits of the project outweigh the impacts and/or that the project is of overriding public interest; there is no better environmental option; the reasons for those modifications are set out and explained in the River Basin Management Plans.

3. **Hydropower schemes should undergo a process of thorough IWRM planning where both Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA), including transboundary assessments for plans/programmes and projects that have significant effects on another territory play a decisive role,** next to the WFD and nature legislation, with consent being granted for the acceptability of impacts on plant and animal life, water, sediment, etc. In a transboundary environment, there is one more consent to be provided from each of the involved administration. Specifically, the following should be considered:

   A). Proposed reservoirs use:

   - A hydropower reservoir can exacerbate droughts in downstream countries, change sedimentation regimes, and block fish passages. But when developed in conjunction with flood protection significant benefits could be obtained. The use of a reservoir for flood control can help flood prevention in downstream countries and can regularise flow regimes.
   - Diversion of a water quantity from one river basin to another should be approached on an individual basis. The transfer of water is not specifically excluded, but if the benefits and externalities are in favour of it, any decision making should consider such a possibility.

   B). Geographical position of reservoir:

   - If a reservoir (or cascade) is in an upstream state A and it has positive and/or negative externalities in downstream state B (e.g. Vardar/Axios, Ćehotina), then negative impacts and externalities should be mitigated within economic feasibility conditions. Together with any beneficial effects and externalities, a Cost-Benefit Analysis will be developed and used for negotiations. Cumulative Impact Analysis will be used as a reference for the evaluation of reservoir impacts on a downstream state B. If the flow downstream is modified favourably it can be the subject of compensation from state B to state A or the opportunity to rightfully participate in an investment model.

C). Measures/instruments/legal acts to plan and survey the environmental and social effects of a hydropower plan including transboundary:

- Legally required environmental impact assessments as requested by EIA, Espoo Convention, Habitats Directive and WFD, together with project planning and strategic environmental assessment (SEA) for plans and programmes, to foresee environmental impacts and address the question if the project should proceed. Then during construction and operation, mechanisms to monitor and mitigate cumulative environmental impacts.
- Measures to monitor and mitigate water balance, sediment transport and connectivity of biodiversity. Realisation of a river monitoring service at gauging stations located at state borders.
- Mechanisms to assess the socio-economic effects of hydropower/flood protection reservoirs: in this respect the existing agreement, especially if relatively ancient, should be rewritten and negotiated again in the present political constellation. Exceptionally, agreements can be reconfirmed if acceptable to all parties.
- Economic effects of multipurpose reservoirs, but predominately energy and flood protection should be maximised, to promote faster realisation under the condition that environmental impacts are compensated realistically.

4. As already indicated, the application of sustainability principles require that **water management and utilisation be considered in the context of a whole catchment area and not on a river-by-river or project-by-project basis.**

   When one or more interventions in a river system are planned, e.g. reservoirs, then **the cumulative impacts will be significant, and should be assessed in accordance with EU acquis and international best practices**.

   For a detailed quantitative assessment of cumulative impacts assessments (relating to, for example, water flows, sedimentation transport, fish paths) by river basin, one needs to have as a minimum: (i) SEA and EIA undertaken at as early stage as possible during development and prior to adoption of strategic planning documents, (ii) an integrated water management plan, (iii) a plan of construction of HPPs on the main water streams and tributaries including the dynamics of their commissioning, and (iv) developed HPP proposals (i.e. pre-feasibility and feasibility studies completed).

5. One of the most important findings of the Study is that there is no consistent, reliable set of data on water resources in the region. In order to allow for better hydropower generation planning, **all WB are encouraged, as a matter of priority, to improve their hydrological data gathering network for future integrated water resources planning.**

   Improving basin-wide hydrology monitoring, data verification and exchange, and knowledge sharing are key. These include joint monitoring (e.g. water flows and quality), joint forecasting (e.g. weather forecasts, energy demand), as well as the identification of good practices at local and national level (e.g. non-economic valuation of external benefits and costs).

   As a minimum, the following WFD requirements on monitoring should be taken into account:

   - Establish monitoring programmes/networks needed for a coherent and comprehensive overview of water status including wetlands within each RB;
   - Cover both surface-water and ground-water bodies, as well as coastal waters;
   - Include ‘surveillance’, ‘operational’ and ‘investigative’ components;
   - Additional monitoring is included in the case of protected areas.

6. A **regional strategy for the management of water resources** is particularly important for successful climate change adaptation measures in the Western Balkans. The region’s water resources are highly exposed and sensitive to climate and climatic change. The fates of flood protection, agricultural and energy sectors are closely tied to the water sector. With several transboundary river and lake basins, WB have a good chance to manage their water resources by cooperating effectively, whether through an existing agreement or a new one, or a series of bilateral efforts.

7. The Study assumes that both drought and flooding will become more extreme compared to the present state, while the average annual discharge will remain approximately the same in the near to mid-term period. Consequently, the **adaptation of hydropower facilities to climate change**, characterised by occurrence of extreme low and high discharges, should be in reservoir development. Reservoir volumes should be sized to compensate for the increased seasonal water imbalance in future.

8. Given the lack of consistent, reliable water resource monitoring data, the effect of climate change on future hydropower output, at river basin/individual HPP level, could not be quantified through this Study. **Individual assessments of what the effect**

of climate change will be on hydrological yield and consequently energy yield for the expected 40/80 years of a given HPP asset life should be undertaken as part of feasibility study investigations.

9. In the case of greenfield projects: solid analysis of planning, design, operation and maintenance of the HPP is required. **Adaptation options must be part of the design.** Water demand and water use in the river basins in which the HPP will be constructed, must be taken into account. If not, the hydropower generation design parameters will not reflect the HPP economic potential during its operation.

10. In addition, the possible reduction of electricity generation in an individual HPP that is being planned (as separate section on potential climate change impact on the future HPP) should become part of any **sensitivity analysis** that is carried out during the feasibility study stage.

11. If properly planned, the development of sustainable flood protection in a particular river basin should be possible without compromising the environmental objectives of the WFD. **All flood risk management activities should be planned and carried out in line with Article 9 of Floods Directive (Directive 2007/60/EC)**, which requires taking appropriate steps to coordinate the application of the Floods Directive with the WFD, focusing on opportunities for improving efficiency, information exchange, and for achieving common synergies and benefits regarding WFD's environmental objectives.

    However, existing flood protection measures remain one of the main causes for the interruption of river and habitat continuity. A normal part of flood action plans are the technical flood defence measures (e.g. construction of new dykes and consolidation of the banks). These plans must be combined with measures for restoration of river and habitat continuity.

    Appropriate regulations regarding land use and spatial planning (e.g. limitations related to land use in flood-prone areas) must be adopted in parallel with flood protection activities.

12. Good practice recommendations for environmental mitigation during **hydropower refurbishment** projects includes providing:

    - An ecologically optimised river flow reflecting the ecologically important components of the natural flow regime, including a relatively constant base flow and more dynamic/variable flows.
    - Where relevant, effective provision for upstream and downstream migration of fish, including sufficient flows.
    - Dampening of hydropeaking by, for example, gentle ramping or discharging tailrace flows into a retention basin.

    The choice and design of mitigation should take into account relevant site-specific circumstances, specifically the potential for ecological improvement.

13. **Hydropower projects must be planned and developed based upon either already-transposed and implemented EU legislation or the principles of EU legislation where transposition and adoption does not yet exist**. In the context of environmental sustainability, this refers to the SEA, EIA, Birds and Habitats directives, together with the Water Framework Directive and Floods Directive, and the Espoo, Aarhus and Berne Conventions. Using additional guidance (such as the Guidance on the requirements for hydropower in relation to Natura 2000, EC 2018) during hydropower planning may also prove instrumental for the successful development of sustainable hydropower in the Western Balkans.

14. It is very important to use pre-planning and planning mechanisms to designate specific river basins, or stretches of rivers, as areas for hydropower development, either for individual projects or for hydropower cascades. **From an environmental perspective, rather that random HPP development, it makes more sense to develop hydropower as a cascade along a particular river system, such that in the planning of that cascade full investigations can take place for environmental baselines, and SEA studies can be undertaken within the context of whole cascade to understand and resolve cumulative impacts and transboundary issues.** More importantly, the **WB should establish clear "no-go" areas for new hydro-power projects, based on the protection of nature conservation values.** The available strategic planning mechanisms (SEA, RBMP) are irreplaceable tools for sustainable hydropower development and successful multiple water uses.

15. Additional r**egional recommendations** include:

    - Establishment of Ecologically Acceptable Flow (EAF), and the processes for monitoring that the EAF is maintained.
    - Transboundary issues and cumulative effects must be addressed properly at the river basin area level.
    - Stimulate transition to more adaptive management of transboundary regimes which differs between river basins throughout the WB.
    - A full assessment of cumulative effects should be undertaken for every hydropower project during the HPP projects development.

- Joint mechanisms implemented from the start of a cooperative hydropower project can help to prevent, mitigate and monitor adverse effects, and on social systems, where the dialogue will ensure that any emerging adverse effects are shared in a fair and equitable manner.
- Unmitigated or poorly mitigated negative impacts can cause flooding of houses and land in the HPP surrounding area and in downstream area, and hence a Resettlement / compensation plan must be developed.
- Prospective mitigation concepts are identified and based on that, recommendations for follow-up made.
- In order to avoid irreversible damage to nature, it is recommended that all WB define, at the level of river basin, areas for further development as well as areas in which development should be limited or completely avoided ('no-go' zones).
- It is of utmost importance for all WB to ensure that mitigation measures for ecology and biodiversity are location- and project-specific. Development of monitoring systems for the effectiveness of prescribed mitigation measures is essential for the assessment of their successful application.
- It is essential to map all the riparian habitats and harmonise habitat data across the region.
- It is recommended that the WB develop and maintain a regional inventory of benthic fauna and invasive species.
- WB should develop and harmonise a biodiversity monitoring programme for transboundary river basins.
- All WB should make a strong effort to ensure that all pollutants are moved outside of the flood plains (e.g. landfill) or are appropriately managed (e.g. wastewaters).
- WB should start as soon as possible, for all planned HPP's with potential transboundary impact, the development of transboundary river basin environmental impact assessments (transboundary EIA), or cross-border SEA, including CIA, at the earliest stage of project identification.
- All WB need to develop a public inventory of all planned protected areas. The database on planned protected areas should include whenever possible, the GIS defined borders of planned protected areas.
- Sustainable development of hydropower in the region absolutely requires the improvement of resources, skills and institutional capacity within both the agencies dealing with the technical approaches to hydropower development, and also within agencies responsible for the environmental protection and formulation of relevant policy solutions.
- Important sustainability issues are better to be resolved during the planning and designing phases of a HPP project. This subject is even more important when a HPP cascade is planned. For that reason, all stakeholder sectors must be involved and a strategic assessment must be made to consider all the development plans for that specific river basin, in the transboundary context. By adopting such a process, potential conflicts are identified at an early stage and different solutions can be discussed before reaching a final decision.
- In the cases where a design has been already developed without proper assessment relating to environmental factors at the strategic level and/or at the project level, redesigning should be considered to avoid the cost of retrofitting environmental mitigation measures afterwards, when the HPP is already operational. Additional unforeseen mitigation measures are usually costlier and harder to implement after construction and in the private sector the concessionaire, operating under contract, will not be prepared to finance these measures.
- High quality SEA for plans and programmes and EIA for all projects and appropriate assessments as per the requirements of the Habitats Directive must be undertaken at the time of development of the strategic planning documents (e.g. energy and water strategies, spatial plans at different levels etc.) and before the adoption thereof. These should be associated with improved public consultation processes for SEAs and EIAs.

EXISTING LARGE HYDROPOWER PLANTS – REHABILITATION

Beneficiary	Hydropwer Plant	FA	PFS	FS	ESIA	Main Design	Permitting	River Basin	Capacity (MW)	Estimated Cost (€million)
Albania	Uleza	✗	●					Mat	25.2	TBD
	Shkopeti	✗	●					Mat	24	TBD
	Fierza	✓		●				Drin-Buna	500	32.3
Bosnia and Herzegovina	Jablanica	✗				●		Neretva	180	3
	Una-Kostela	✗					●	Sava	10.1	16.8
	Jajce 1	✗	●					Sava	60	TBD
	Jajce 2	✗				●		Sava	7.2	TBD
	Čapljina	✗	●					Trebišnjica	440	TBD
Kosovo*	Ujmani !	✓		●				Velika-Morava	35	9.8
Montenegro	Perućica	✗	●					Morača	307	65.3
	Piva	✗		●				Sava	342	86.7
North Macedonia	Vrben	✗		●				Drin-Buna	12.8	4.6
	Shpilje	✗		●				Drin-Buna	84	3.9
	Globočica	✗		●				Drin-Buna	42	5.8
	Tikvesh	✗		●				Vardar	116	0.84
	Vrutok	✗		●				Vardar	165.6	4.05
	Raven	✗		●				Vardar	21.3	0.92
Serbia	Djerdap 2	✗	●					Danube	270	150
	Uvac !	✗	●					Sava	36	TBD
	Potpeć !	✓					●	Sava	54	50
	Kokin Brod !	✗	●					Sava	22.5	TBD
	Bistrica	✗		●				Sava	104	25
	Pirot	✗	●					Velika-Morava	80	TBD
	Vlasina System !	✓					●	Velika-Morava	128.5	48

FA = Financing Agreement PFS = Pre-feasibility Study FS = Feasibility Study ESIA = Environmental and Social Impact Assessment

Protected Area

Area of special importance for fish / (threatened and / or migratory species)

! In need of urgent rehabilitation (no previous interventions)

● Current Status: Project preparation/ implementation as due

● Current Status: Stalled project preparation /implementation (e.g. +3 year old studies; no construction)

* This designation is without prejudice to position on status, and is in line with UN Security Council Resolution 1244/99 and the International Court of Justice Opinion on the Kosovo declaration of independence.

LARGE HYDROPOWER PLANTS – STATE OF PLAY OF GREENFIELD PROJECTS

The purpose of this list is to illustrate the status of hydropower plants projects with a design capacity in excess of 10 MW, which have gone beyond the due diligence stage in terms of project preparations. It does not indicate which hydropower project should be built.

It indicates the estimated investment costs and sensitive environmental and social aspects which should be duly considered in their development.

The list includes two categories:

- Greenfield projects which do not face serious bottlenecks;
- Greenfield projects which face serious bottlenecks (e.g. litigations) or environmental and social concerns.

Most of these hydropower projects are in areas of special importance for fish or may potentially lead to resettlement.

The main assumption is that all hydropower projects on this list and any future hydropower projects will be subject to best-practice exploration of the technical, financial, social and environmental feasibilities as well as to the further designation of Natura 2000 sites and no-go zones by WB so as to ensure that the projects are implemented with a minimal impact.

The Principles for Sustainable Hydropower Development, which complement this list, should therefore inform any future project preparation and implementation activities in this sector. These may be found on page 14.

1. Greenfield projects which do not face serious bottlenecks

Beneficiary	Hydropower Plant	FA	PFS	Feasibility Study	ESIA	Main Design	River Basin	Capacity (MW)	Estimated Cost (€million)
Albania	Skavica 385	✗		🟢	🐟 ❗		Drin - Buna	132.0	255
	Katundi i Ri	✗		🟡	🐟 ❗		Drin - Buna	49.0	255
	Mati 1	✓	🟡				Mat	14.7	18.0
	Mati 2	✓	🟡		🐟		Mat	14.8	18.9
Bosnia and Herzegovina	Skakala	✗	🟡		🐟 ❗		Neretva	26.4	82.3
	Kovanici	✗		🟢	🐟 ❗		Sava	13.3	38.8
	Janjici	✗		🟢	🐟 ❗		Sava	13.3	55.0
	Vinac	✗	🟡		🐟 ❗		Sava	11.5	25.1
Montenegro	Komarnica	✗		🟢			Sava	172.0	178.3
North Macedonia	Tenovo - Kozjak Channel	✗	🟢		🐟 ❗		Vardar	35.0	84.0
	Cebren	✗		🟢	🐟		Vardar	458.0	553
Serbia	Ibar Cascade	✗			🟡 ❗		Velika Morava	121.5	345.4
	Ribarice	✗		🟡	🐟		Velika Morava	46.7	97.3
	RHE Bistrica	✗		🟡	🐟		Sava	680.0	551.1
	Djerdap 3 - Phase 1	✗		🟡			Danube	600.0	418.0

FA = Financing Agreement PFS = Pre-feasibility Study ESIA = Environmental and Social Impact Assessment

🟢 Current Status: Project preparation/implementation as due

🟡 Current Status: Stalled project preparation /implementation (e.g. +3 year old studies; no construction)

🔴 Current Status: Serious stumbleblocks (e.g. litigations; permits/studies rejected)

🐟 Area of special importance for fish / (threatened and / or migratory species)

❗ Potential resettlement

2. Greenfield projects which face serious bottlenecks (e.g. litigations) or environmental and social concerns

Beneficiary	Hydropower Plant	FA	PFS	Feasibility Study	ESIA	Main Design	River Basin	Capacity (MW)	Estimated Cost (€million)
Bosnia and Herzegovina	Bjelimici	✕					Neretva	100.0	165.7
	Glavaticevo	✕					Neretva	28.5	72.9
	Foca	✕					Sava	44.2	117.8
	Paunci	✕					Sava	43.2	124.4
	Buk Bijela	✕					Sava	93.5	194.4
	Sutjeska	✕					Sava	44.1	138.1
	Rogacica	✕					Sava	113.3	245.6
	Tegare	✕					Sava	120.9	284.6
	Dubravica	✕					Sava	87.2	348.2
	Kozluk	✕					Sava	88.5	303.2
	Drina 1	✕					Sava	87.7	287.1
	Drina 2	✕					Sava	87.8	329.0
	Drina 3	✕					Sava	101.0	427.2
	Ustikolina	✕					Sava	60.5	139.9
	Gorazde	✕					Sava	37.0	56.3
	RHE Bjelimici	✕					Neretva	500.0	232.9
	RHE Buk Bijela	✕					Sava	600.0	376.1
	CHE Vrilo	✕					Neretva	66.0	95.9
Kosovo*	PSHP Vërmica	✕					Drin-Bune	480.0	308.6
Montenegro	Zlatica	✕					Morača	37.0	98.1
	Raslovici	✕					Morača	37.0	85.2
	Milunovici	✕					Morača	37.0	89.3
	Andrijevo	✕					Morača	127.0	225.8
Serbia	Rogacica	✕					Sava	113.3	245.6
	Tegare	✕					Sava	120.9	284.6
	Dubravica	✕					Sava	87.2	348.2
	Kozluk	✕					Sava	88.5	303.2
	Drina 1	✕					Sava	87.7	285.5
	Drina 2	✕					Sava	87.8	329.0
	Drina 3	✕					Sava	101.0	427.2

* This designation is without prejudice to position on status, and is in line with UN Security Council Resolution 1244/99 and the International Court of Justice Opinion on the Kosovo declaration of independence.

PRINCIPLES FOR SUSTAINABLE HYDROPOWER DEVELOPMENT IN THE WESTERN BALKANS

Hydropower among other renewable energy sources

Hydropower development should be part of a broader strategy to replace carbon-intensive generation capacity because it helps to achieve the binding renewable energy targets established in the National Renewable Energy Action Plans in wager to overcome the electricity deficit in the region. All renewable energy sources should play a strategic role to the new energy mix. Energy efficiency measures will be implemented in parallel. The implementation of the EU Large Combustion Plants Directive (Directive 2001/80/EC), Industrial Emissions Directive (Directive 2010/75/EU) and Renewable Energy Directive (Directive 2009/28/EC) represents an important driver for the WB o develop renewable energy sources.

The rehabilitation of existing structures as a priority

Rehabilitating and increasing the efficiency of existing hydropower plants in combination with ecological restoration measures shall be the first, immediate priority for investments. This is to safeguard the existing capacity and generation that hydropower currently contributes to the region's energy mix.

A limited number of additional hydropower plants

Some new hydropower plants could be developed across the region in line with international best practices and relevant EU acquis. The development of greenfield projects should be limited to large hydropower plants, as the contribution of small hydropower plants (of a capacity 10 MW or less) to the global energy production is extremely limited while their impacts on the environment are disproportionately severe.

Grid integration of renewable energy sources and regional electricity market

Hydropower development needs to be accompanied by adjustments to the transmission and distribution networks. Developing the regional electricity market would make sure that project developers have a wider market for their production. Investments aimed at reducing technical losses will be undertaken as a priority.

Integrated water resources management

Hydropower development must take into account of upstream and downstream interactions, which go beyond administrative and political boundaries. The implementation of the EU Water Framework Directive (Directive 2000/60/EC), an essential piece of legislation on the path to EU accession, requires the development of River Basin Management Plans which would account for all water sources and uses.

River Basin Management Plans shall contribute to the proper assessment of the region's viable hydropower capacity and to the assessment of the cumulative effect of existing infrastructures and prospective projects. In addition to international best practices, the following will be used in river basin management plan development: European Commission guidelines on Natura 2000 and hydropower and the Common Implementation Strategy (CIS) guidance on article 4(7) of the EU Water Framework Directive , along with other existing CIS guidance; the International Commission for the Protection of the Danube River Guiding Principles: Sustainable Hydropower Development in the Danube Basin.

The climate challenge for hydropower development

Existing assumptions about hydropower plants' viability will need to be updated to take account of hydrological alterations resulting from climatological change. Climate adaptation scenarios will have to be integrated into the future development of hydropower. The multipurpose use of hydropower infrastructure linked to flood control measures should be considered as part of any flood protection strategy.

Environmental impacts of hydropower development

The region's unique nature and biodiversity features several pristine river ecosystems. Balkan waterways provide its inhabitants many services that are essential to their livelihoods and this means that hydropower must be developed in compliance with the highest standards of ecological preservation. According to the Water Framework Directive, hydropower development shall not lead to the deterioration of a water body's status as long as the conditions for exemptions are not met; it shall also maintain a favourable conservation of habitats and species. Therefore, relevant EU environmental legislation, notwithstanding its transposition status, and applicable international conventions shall constitute the reference for hydropower development, as follows:

- EU Water Framework Directive (2000/60/EC) and the two associated directives: the Environmental Quality Standards Directive (2013/39/EU) and the Groundwater Directive (2006/118/EC);
- EU Floods Directive (2007/60/EC);
- EU Birds and Habitats Directives (2009/147/EC and 92/43/EEC);

- EU Strategic Environmental Impact Assessment and Environmental Impact Assessment Directives (2001/42/ EC and 2011/92/EU as amended by Directive 2014/52/ EU) ;
- Aarhus Convention (UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters);
- Espoo Convention (UNECE Convention on Environmental Impact Assessment in a Transboundary Context) and the associated SEA Protocol;
- Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats)
- Relevant transboundary water conventions and agreements (e.g. Convention on the Protection and Use of Transboundary Watercourses and International Lakes; the Danube River Protection Convention; Framework Agreement on the Sava River Basin).

These requirements are interlinked and should therefore be implemented in a coordinated manner.

Some areas in the region host particularly high nature and biodiversity value, making them more vulnerable to hydropower developments. Not all impacts of hydropower development can be mitigated because of this. Such zones should be identified and preserved and they should preferably be excluded from hydropower development. The on-going process of designating Natura 2000 sites will contribute to the identification and preservation of such areas.

Transboundary considerations

A transboundary approach to hydropower is essential in a region where most, if not all, river basins are shared, and any such development will significantly affect the water balance and the flow upstream or downstream. EU legislation and several applicable international conventions specify how to co-operate successfully on such transboundary aspects. Planning hydropower development at the level of river basins, with the development of integrated River Basin Management Plans – as required by the EU Water Framework Directive – will ensure that all relevant interests are considered.

Including sustainability principles in hydropower planning

Sound strategic planning and high standards in project design will be achieved with the development of high quality Strategic Environmental Assessments and Environmental Impacts Assessments. The EU Directives shall be the reference for preparing such assessments – not only the Strategic Environmental Assessments and Environmental Impacts Assessments Directives but all relevant Directives, such as the Water Framework Directive and the Habitats Directive. These assessments should cover not only the environmental impacts but also all pertinent aspects, including integrated water resources management, the effects of changes in climate patterns, transboundary considerations as well as social impacts and the need to preserve cultural heritage.

For projects that are likely to have significant effects on the environment, the Environmental Impact Assessments must be systematically undertaken and quality-checked, when developing greenfield projects and when rehabilitating existing infrastructures. Environmental mitigation and ecological restoration measures proposed by such assessments will be undertaken as due.

The Environmental Impact Assessments should not only consider impacts at the scale of the project site but also at the scale of the river to address potential consequences upstream and downstream, including cumulative impacts with other activities. Projects located in designated protected areas, or in areas of high nature and biodiversity value and vulnerability, shall be assessed with a higher scrutiny. This is to comply with the provisions of the EU Habitats and Birds Directives.

Projects that are expected to cause deterioration to water bodies should only go ahead if compliant with the Water Framework Directive's provisions.

All assessments must be subject to proper public consultation, engaging with local communities and civil society organisations. Transboundary consultations with affected WB will also be undertaken.

European Commission
Directorate General Neighbourhood Policy and
Enlargement Negotiations
Western Balkans Regional Cooperation Unit
WBIF Secretariat

www.wbif.eu
near-wbif@ec.europa.eu