



REGIONAL

Promoter:

- European Commission, DG NEAR

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- Infrastructure Project Facility 3

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- April 2016 – June 2017

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- €1.2 million

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- April 2016

Estimated end date:

- June 2017

Study on Hydropower Development in the Western Balkans

As of May 2016, the existing and under-construction hydropower capacity in the Western Balkans amounts to 8,400 MW, generated by 53 hydropower plants (HPPs) of 10 MW or larger, and 203 HPPs of less than 10MW. In terms of geographies, capacities vary from 60 MW in Kosovo* to approximately 1,800 - 2,100 MW in Albania and Bosnia and Herzegovina, and 3,100 MW in Serbia. Historically, about 93% of current capacity was commissioned in the former Yugoslavia prior to 1990, whereas only 7% has been developed after the latter's disintegration.

According to existing scholarship and studies, the current hydropower generation capacity of the Western Balkans could increase by 60% to 90%, contingent on each beneficiary's geographic conditions. This project aims to provide an overview of the hydropower potential of the Western Balkans, including recommendations on investments which would turn such a potential into concrete renewable energy resources.



Bajina Bašta Hydroelectric Power Plant in Perućac, Serbia.

Results:

- Current status and development strategies, including database of HPPs;
- Overview of hydrology/water management and transboundary issues;
- Overview of grid connection issues
- Greenfield HPP projects
- Environmental analysis
- IT systems in support of HPP;
- Recommendations on HPP development
- Regional Action Plan
- Training.



Iron Gate II Hydroelectric Power Station, Serbia and Romania.

Beneficiaries:

- Western Balkans Beneficiaries
- European Commission and EU Member States
- Energy Community
- International Financing Institutions
- Private and public investors in renewable resources.



Kozjak Dam, the former Yugoslav Republic of Macedonia.

Specific activities to be undertaken for the purpose of this Study include:

- Task 1: Hydropower role (past and future) in the regional and national context;
- Task 2: Assessment of the current situation in the institutional-organisational framework relevant for hydropower development;
- Task 3: Assessment of the current situation in the legal-regulatory framework relevant for hydropower development;
- Task 4: Assessment of hydrology baseline, water-management by country and by river basin with transboundary issues;
- Task 5: Grid connection issues in network development context;
- Task 6: Identification of HPP projects and acquiring relevant information for the HPP inventory and investment planning;
- Task 7: Environmental, Biodiversity and Climate Change Analysis on (i) river basin level and (ii) country-level of identified hydropower schemes;
- Task 8: Establishment of the central GIS database.
- Task 9: Development of a web-based GIS application;
- Task 10: Multi-Criteria Assessment (MCA) of prospective HPP projects;
- Task 11: Drafting of Regional Action Plan on Hydropower Development and compilation of Final report on the Study;
- Task 12: Establishment of IT-supported Information and Document Management System (IDMS);
- Task 13: Training and dissemination of Study results.

Limitations

As indicated above, this assignment will provide an overview of the hydropower potential of the Western Balkans, with adequate consideration of the environment, climate change and integrated water management aspects that are key for the present and future hydropower development policies.

The Study is primarily aimed at promoting energy from renewable energy sources and developing the regional hydropower potential in the complex framework of conditions prevailing currently. It will deliver an energy sector proposal for hydropower development in the Region, bearing in mind that particular conditions and limitations (typically environment, social, political, etc.) will be dealt with in later stages of planning. Therefore, the Study will not address any issues from a narrow perspective of any specific stakeholders particular interest.

For several reasons (e.g. lack of mandate, prevailing local conditions, time available etc.) **the Study will not address and cannot provide the following types of outputs**, for which specific national institutions or public or private or mixed entities are typically responsible for, in accordance with specific national legislation or regulations in the WB6 countries:

- **New River Basin Management Plan (RBMP)**. However, the Study will assess the current status of development thereof or even, the current level of transposition of Water Framework Directive (WFD) and its considerations and the likely implications on the hydropower development in the medium-term future. Also, limitations regarding deficiencies of RBMPs for hydropower sector development will be identified, discussed and recommendations provided in the Action Plan.
- **SEA at the river basin level or programme level, EIA at the project level and/or ESIA typically requested by IFIs** because these are clearly within the competence / responsibility of national policy-making authorities, where provisions of relevant EU-directives should be strictly followed, including the demanding public consultation processes. However, recent practices in SEA /EIA / ESIA of HPP projects in the region will be critically assessed and practical guidelines how to improve the applied procedures aiming at bringing them towards EU best practices will be provided.
- **New (pre)feasibility studies** (including technical redesign of the currently known HPP schemes), because this is within the responsibilities of the developer. However, the Study will identify candidate HPP projects that represent possible points of dispute in design and technical solutions offered especially if they relate to framework conditions (ecological, climate change, economic-social aspects) that may not represent state-of-art in applicable EU practices. In such cases, recommendations for redesign of the schemes will be provided by the Study.
- **Consideration of sHPPs at the individual power plant or tributary level** – no new cadastres of sHPPs will be developed. It is worth noting that based on the preliminary assessment presented in the Scoping report, as many as 960 sHPPs (1,524 MW, of which approx. 1,300 MW are already part of NREAPs by 2020) could be constructed in the WB6 region, as opposed to a minimum of 168 HPPs of more than 10 MW of installed capacity (11,777 MW). Some analysis suggests that 14,637 MW in total could be theoretically constructed, which leads to conclusion that sHPPs may represent up to approx. 10% of all new installed capacities at the maximum. For practical reasons, it is therefore unfeasible to assess and quantify the ecological and cumulative impacts of these sHPPs individually within the frame of the Study. In addition, several WB6 countries address sHPPs by selected tributaries, in many cases still requesting the prospective concessionaires to carry out hydrological measurements (mainly discharge) first. Together, this indicates the currently prevailing situation is that the exact scope of realistically implementable sHPPs, their construction dynamics etc. are very questionable. Finally, collective experience from implementation achievements by 2020 will impact the further development of sHPPs beyond this milestone year, when the current state-support schemes (e.g. Feed-in tariffs) should be reassessed and market driven mechanism introduced. However, the Study will include prospects for sHPPs in its consideration of future electricity supply / demand balance as well as provide discussion and recommendations on possible cumulative impacts of sHPP. Finally, dynamics of introduction of sHPPs is subject to national policies on support schemes for RES-E generation rather than river basin specific.
- **Quantitative assessment of cumulative effects of main rivers** (in terms of selected categories: water discharges, sediments and fishery issues) at cross-border points or at confluences of river (sub)basin with major river basin (e.g. confluence of Drina and Sava). It is obvious that cumulative effects can be assessed in a more precise way by modelling only if: (i) RBMP is available, and (ii) dynamics, number and specific technical designs of proposed individual HPPs in the respective river basin including possible mitigation measures are clearly determined. However, this is far from the reality in the WB6 region. Therefore, cumulative effects will be assessed in the Study to the extent possible, predominantly in qualitative terms, which may differ from one river basin to another. Based on best EU practices, the Study will provide recommendations how the region should address cumulative effects, in particular regarding ichthyology - fish species and ecological flows, based on reassessed hydrology at the level of river basins.

- **National hydropower master-plans.** The Study follows a regional and river basin approach in line with WFD and applicable guidelines (e.g. ICPDR). For that reason alone, the Study cannot provide a National Hydropower Master-Plans. The other main reason is that master-plans are specific strategic planning documents that must be prepared and adopted strictly by following the national legislative framework. That, among other aspects will require national SEA/EIA procedures and public consultation processes. Finally, such documents as major sectoral policy documents are typically adopted by governments or even parliaments in some cases. The Study will provide numerous recommendations that will help national authorities in the development of their own plans to be prepared at a later stage. Therefore, it is evident that the Study results are limited to recommendations rather than any mandatory solutions for the WB6 countries, and clearly the countries retain their sovereignty in decision-making as long as those decisions are compliant with applicable national and international legislation in force.