Drina River Basin nexus assessment-Phase II
Nexus Assessment Report *final draft*

"Promoting the Sustainable Management of Natural Resources in Southeastern Europe, through the use of the Nexus approach"

Lucia de Strasser, Environmental Affairs Officer, UNECE

3° Steering Committee meeting – online

Wednesay 4 May 2022

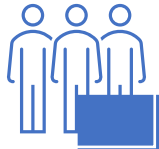
Drina II Nexus Assessment Technical Report - Structure

Background

- A summary of the Drina Nexus Participatory Process throughout the years
- Towards a «Nexus Roadmap» for the Drina RB

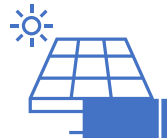
Energy-Water Scenarios

- *Technical/resource focused*
- Sustainable Energy Deployment (modelling of energy-water scenarios) in the Drina



Options for Flow Regulation

- *Legal/Governance focused*
- Flow regulation modalities in the Drina (formalization options)



Conclusions & Recommendations

- From the assessment so far (several topics)
- On Energy-Water Planning
- On Formalizing Flow Regulation

BACKGROUND CHAPTER

Prepared by Dejan Komatina, International Consultant

Overview of previous work on nexus carried out in the Drina River Basin (and previously, in the Sava)

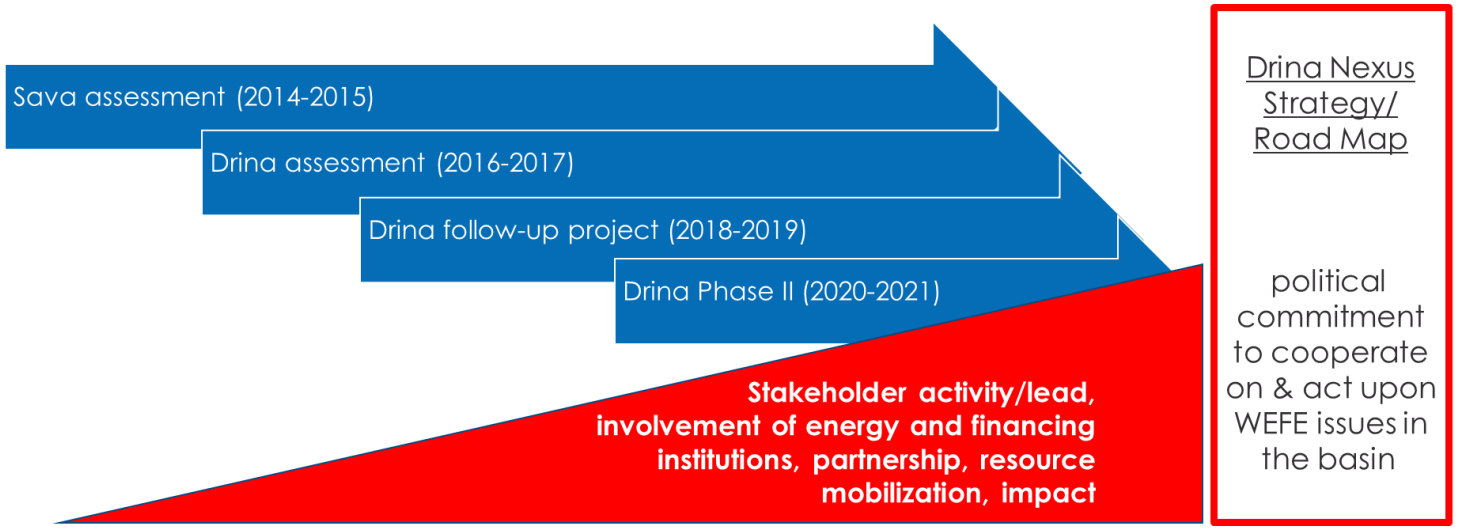


Figure 1. Nexus activities in the Western Balkans (the Sava and Drina River Basins).

RECALLING CONCLUSIONS AND RECOMMENDATIONS FROM THE DRINA NEXUS PROCESS SO FAR

Recommendations fall under the following categories:

1. Transboundary cooperation
2. Governance (cross-sectoral coordination)
3. Economic and policy instruments
4. Infrastructure and innovation
5. Monitoring, and data and information exchange
6. Flow regulation and environmental flows
7. Flood management
8. Water quality management
9. Wastewater and solid waste as pressures on water quality
10. Sedimentation / erosion as a pressure on water quality
11. Renewable energy development
12. Agriculture, rural and eco-tourism development

SUSTAINABLE ENERGY

Prepared by KTH Royal Institute of Technology, Sweden (Emir Fejzić, Francesco Gardumi)

Data from power utilities, model used to build capacity.

WATER-ENERGY MODELLING IN DRINA RB COUNTRIES – SCOPE

Driving question (countries, region): *"How to increase the share of RE in the Drina riparians in a way that optimizes the resources available (including financial), minimizes the negative impact on the environment (including transboundary), and maximises the multi-sectoral benefits of projects?"* (responding to the countries' vision of achieving climate neutrality by 2050 - *Sofia Declaration*)

Key outcome (basin): improving the understanding of hydropower dynamics in the basin (changes in operations for climate adaptation, costs&benefits, competitiveness of new hydro, role of Drina hydro in climate mitigation efforts) (reponding to the riparians need to manage basin resource sustainably under climate change)

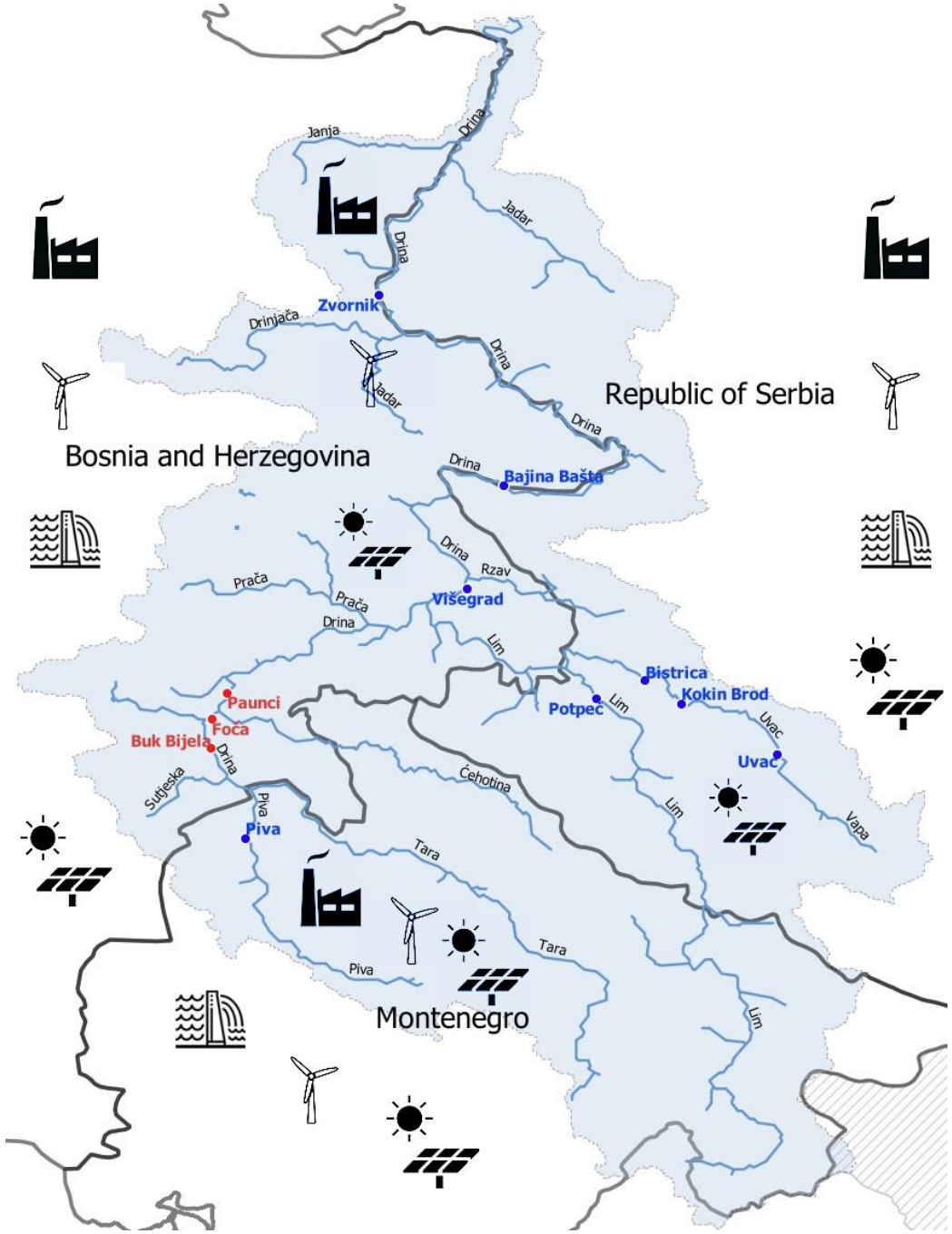
- ✓ **Drina Nexus I**: co-optimization of hydropower in the Drina River Basin, interconnections and trade, energy efficiency policy
- ➢ **Drina Nexus II**: linking hydropower development in the basin to the RE energy and climate commitments of riparians

WATER-ENERGY MODEL

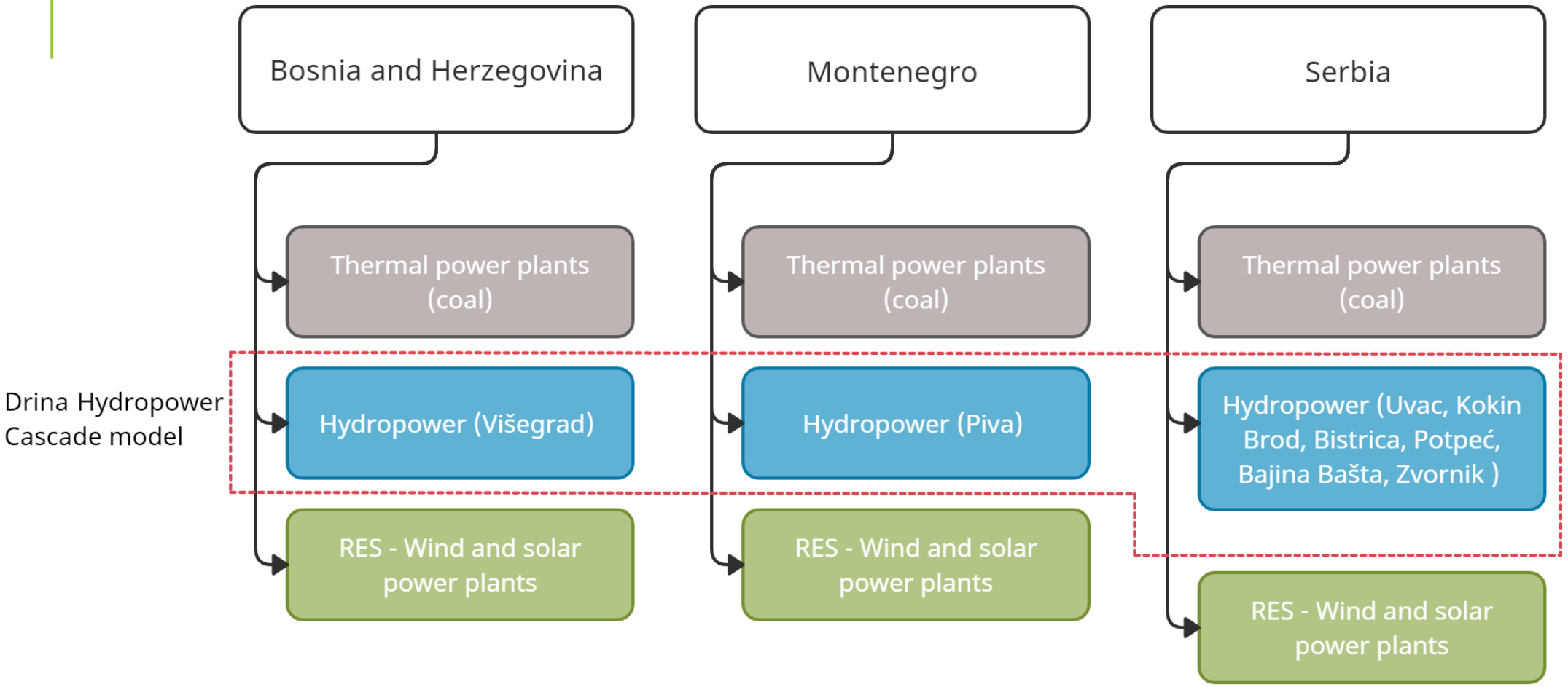
Model: a techno/economic “least cost optimization” model of the power sector

- Power sector in all three Drina River Basin riparian countries (BA, ME and RS) represented with good technological detail
- Emphasis on the operation of hydropower in the Drina cascade

Accessibility: model developed in an open-source framework (OSeMOSYS) to facilitate replicability and transparency (of data and assumptions)



METHODOLOGY



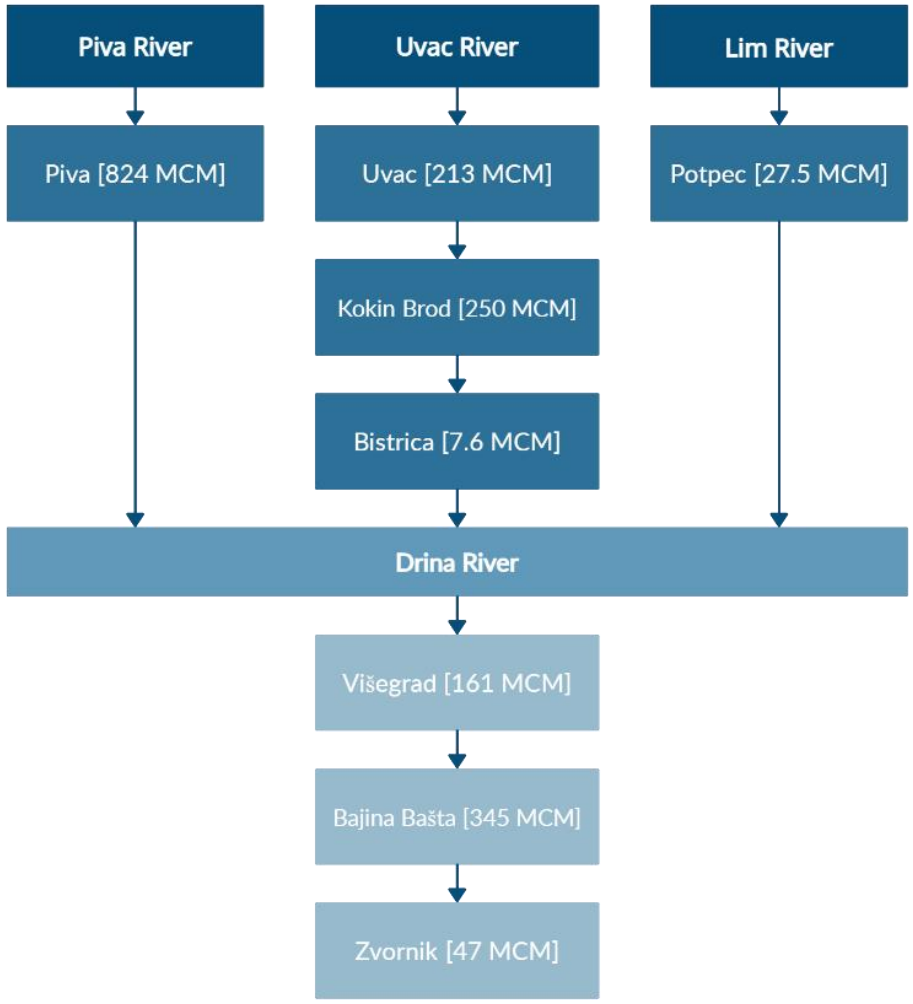
*A distinction made between technologies inside and outside the Drina River basin for each technology type

METHODOLOGY - CASCADE REPRESENTATION

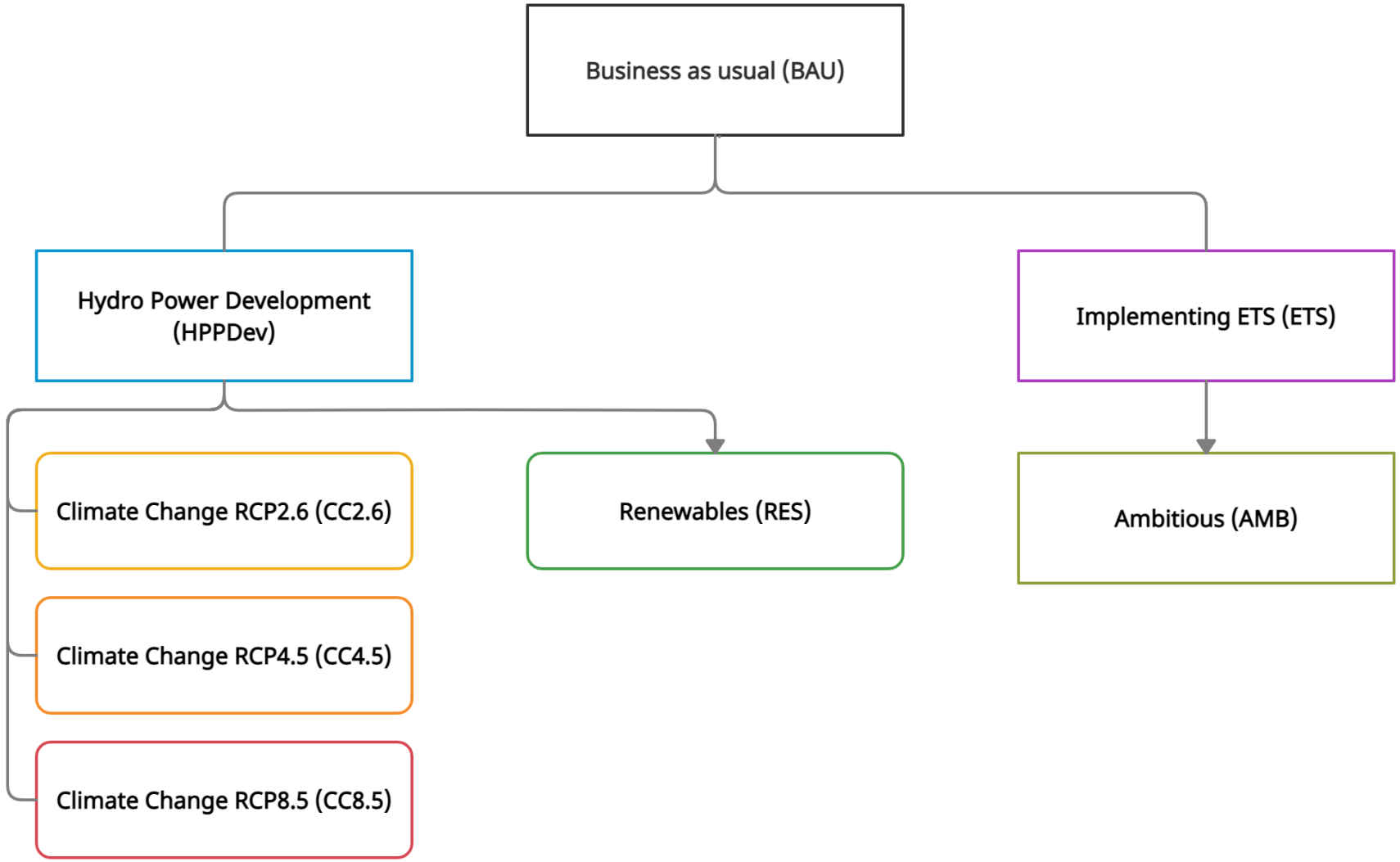
Power supply from hydropower plants within the Drina River Basin based on:

- Water availability
- Rules of operation
- Useful storage volumes and discharge rates

Water availability is controlled by upstream river segments and catchments



THE SCENARIOS EXPLORED IN THIS PROJECT



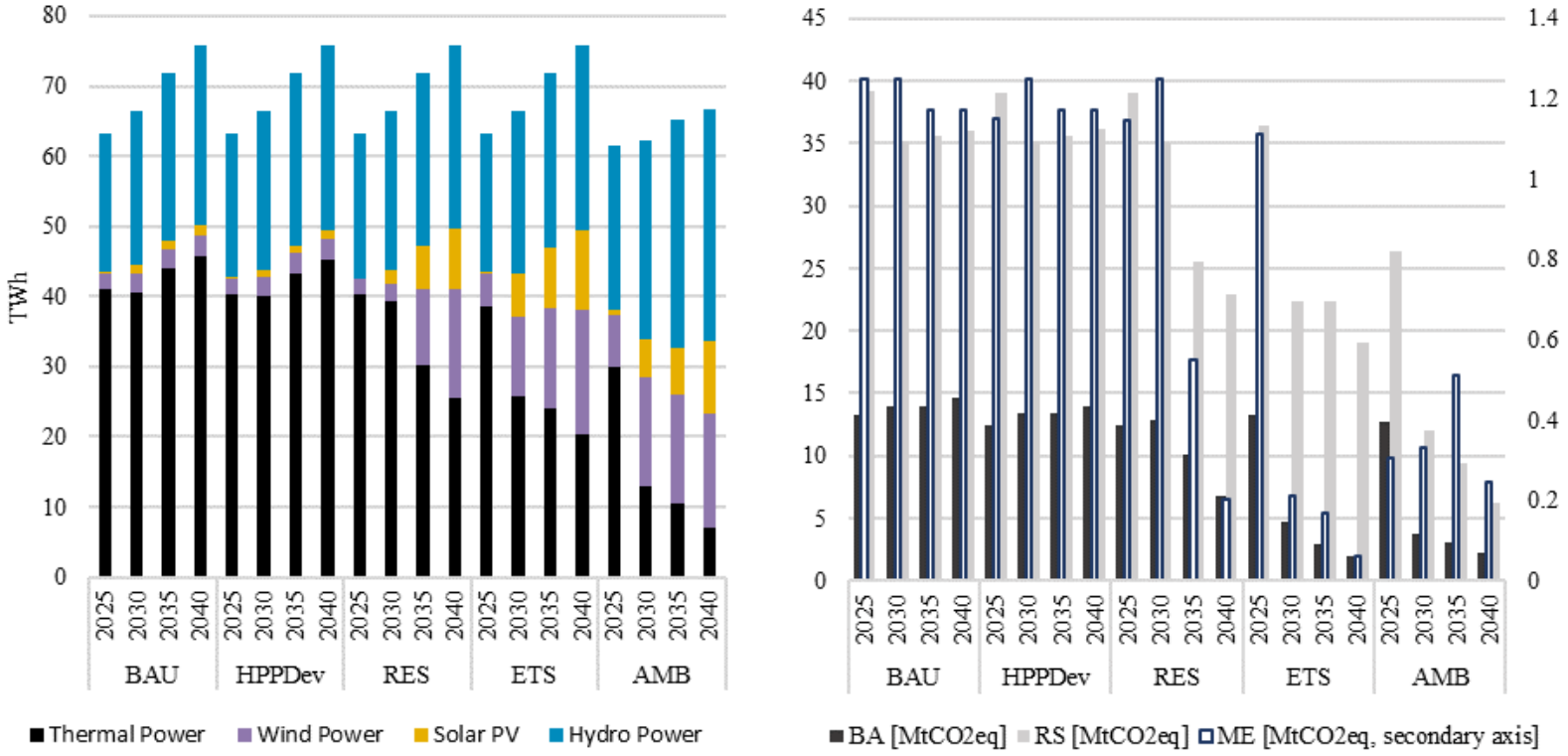
THE ROLE OF RE IN ACHIEVING THE NDCS

RES can determine a sharp decrease of emissions in a cost-competitive way.

Reductions are limited in BAU and HPPDev where RES are limited (old TPPs are replaced by new ones). They are far more significant in the RES, ETS, and AMB scenarios.

The emission reduction in the power sector meet NDC pledges in all countries in ETS and AMB.

Note: From a purely economic perspective, **hydropower remains a competitive source** (under the assumptions of the study, non-hydro RES are competitive with coal but not with hydro).



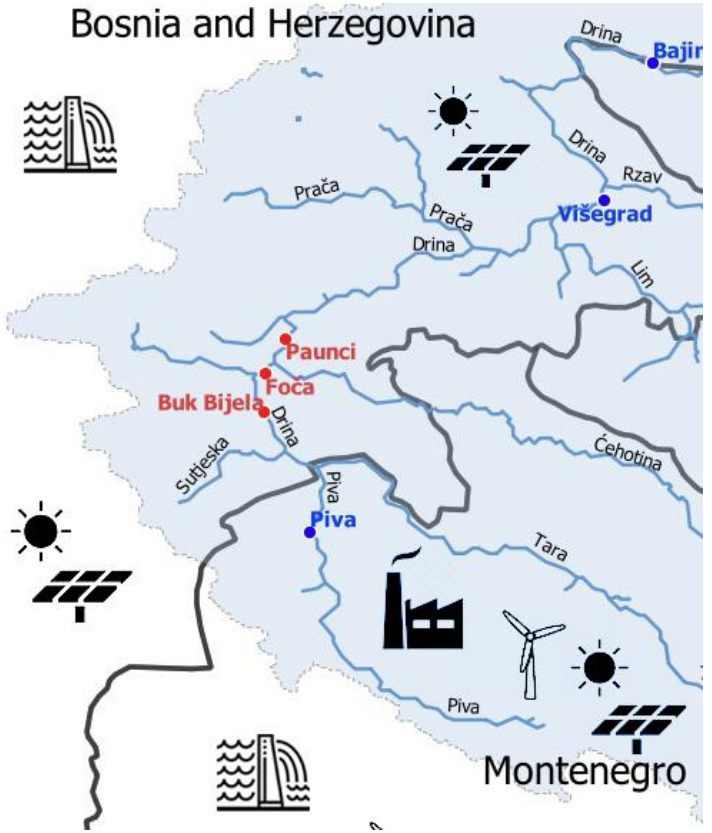
Electricity supply (left) and CO_2eq emissions (right) for multiple scenarios

THE IMPACT OF NEW HPP IN THE DRB (IN A LEAST-COST ELECTRICITY SYSTEM)

Three projects were included in the HPPDev scenario: HPP Buk Bijela, HPP Foča, and HPP Paunci, which had the closest commissioning date according to info available (combined generation capacity of 180.9 MW)

The system-wide impacts on power supply would be modest, however

Expanded hydropower capacity could have important implications on water management (to be explored).

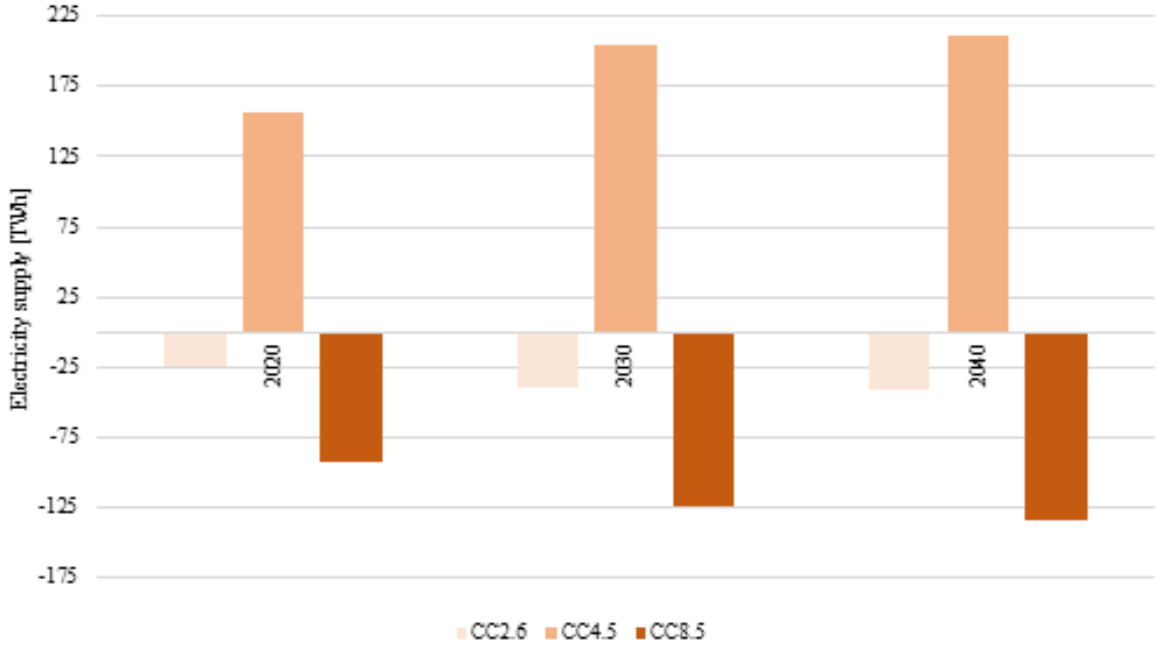


THE EFFECTS OF CLIMATE-INDUCED VARIABILITY ON HYDROPOWER GENERATION

Climatic changes a complex: different possible patterns of precipitation and water availability in the short/medium term.

The impact on the productivity of HPPs c*annot* be predicted with good confidence.

-> HPP should be planned **taking into account the risks in different possible scenarios and their probability** (not on the basis of one or few individual climate projections)



Climate Change impact on power supply from cascade HPPs in the HPPDev scenario under different RCP's.

SELECTED RECOMMENDATIONS

Most effective means to harness the untapped potential for non-hydro RES (thereby decarbonizing the power sector) are:

- facilitating investments in non-hydro RES (improving their competitiveness)
- establishment of a carbon market, carbon pricing (ETS)

Climate uncertainty requires «robust» HP planning (against different possible scenarios)

FLOW REGULATION

Stephen Stec, Central European University CEU

Revised & commented by the Expert Group of E-Flow and Flow Regulation

WHY FORMALIZING FLOW REGULATION?

"All economic activities as well as other interests related to the water, depend on a timely flow of adequate quantities of water, with fit-for-purpose quality.

Currently, in the Drina Basin the regulation of flow is uncoordinated and sub-optimal, and this has an impact on both water availability and quality.

The different users would therefore benefit from a holistic approach to basin management […] To capitalize on the benefits, coordinated policy and technical actions at different levels, across borders are necessary"

Statement from the High-Level Workshop, 2019

Participants agreed that cooperation between sectors at the national and basin level could be improved, there is lack of data in the basin, particularly related to monitoring (incl. on e-flows) as well as relevant information on ongoing projects in the basin.

Participants stressed the necessity of the dialogue between representatives of all hydropower companies and authorities with the aim to harmonize the work of hydropower plants.

2nd meeting of the Expert Group, 29 March 2021.

Where are the gaps in legislation?
How can they be fixed?

DESK REVIEW - THE BASIN, AND INTERNATIONAL EXPERIENCES

International obligations and the status of natonal laws and regulations

- International legal standards (customary international law, water management treaties)
- Water-energy (Energy Community Treaty, SEE 2030, FASRB)
- Multilateral Envrionmental Agreements (Water Convention, UNFCCC, Espoo, and others)
- Distaster Risk Reduction (Sendai Framework and Flood Risk Management Plan of the Sava)
- EU Context (accession process, alignment to EU acquis)
- Bilateral agreements
- National frameworks

Good international practices (objectives, implementation considerations, transboundary arrangements - several examples)

COMMON OBJECTIVES IN THE DRINA

Long-term:

Effective cooperation on a range of issues across-sectors (co-optimizing the value for different uses (hydropower generation, etc.), meeting different water-related needs, minimizing negative impacts from flooding, and ensuring integrity of the ecosystems)

Interim term:

- Developing a road map towards a basin-wide regime for flow regulation, thereby:
- addressing fundamental issues related to basin-wide cooperation generally
- building an enabling environment for action planning in areas relevant to flow regulation
- Establishing a set of milestones and objectives for investments (Action Plan).

KEY RECOMMENDATIONS

Ensuring an effective and inclusive platform for cooperation in the Drina RB

There are alternative ways to strengthen transboundary water cooperation in the Drina RB, based on existing or new platforms.

Actions at the national and basin level in all 3 countries:

- Integration of nexus considerations related to flow regulation into national **DRR planning** (*Sendai Framework*)
- Integration in planning generally, with **intersectoral exchange** of information
- **Renewable energy** planning with state-of-the-art SEA
- Implementation of **transboundary SEA** with respect to relevant plans, programmes and policies
- Coordination of national level **permitting processes**

RECOMMENDATION – HIGH LEVEL COOPERATION

A High-level Meeting on Flow Regulation in the DRB

- Various projects and initiatives produced outcomes that are relevant to flow regulation -> political-level forum needed to enable progress.
- "High level": capable of adopting decisions on Flow regulation, or initiating steps towards them, (potentially adopting the Nexus Roadmap).
- The Expert Group on E-Flows and Flow Regulation could assist in the preparation of the meeting.
- Using/linking to existing relevant cooperation frameworks, e.g. the FASRB.

THANK YOU

lucia.destrasser@un.org

https://unece.org/environment-policy/water/areas-work-convention/water-food-energy-ecosystem-nexus