



Energy

National Research Programmes 70 and 71

Project

Hydropower sustainability





Hydropower for sustainable development

It is not only operators who have an economic interest in hydropower plants. The same is also true for municipal authorities and the cantons. However, these structures have a major impact on the surrounding natural environment. A comprehensive analysis of all sustainability aspects and dialogue between all stakeholders are therefore important for ensuring the successful planning of upgrade measures and the construction of new infrastructure.



A dam in an idyllic landscape: Lac d'Emosson in the Valais Alps. *Source: Adobe Stock*





At a glance

- An integrated sustainability assessment is recommended for new structures as well as the upgrading of existing hydropower plants.
- A project's chance of success can be increased by performing a comprehensive analysis of all of its environmental, social and economic impacts as well as by involving affected groups at an early stage.
- Investment decisions should not be guided solely by financial considerations, but rather also by considerations relating to macroeconomic and social aspects as well as the environmental impact.

The sustainable development of Switzerland is an overriding principle of the Federal Constitution – it therefore also applies to the implementation of Energy Strategy 2050. A central part of this strategy is formed by the generation of electricity using hydropower. Investments in this infrastructure should thus not only be made on the basis of financial considerations. Instead, the three pillars of sustainability, namely the environment, society and the economy, should also be taken into account. An integrated sustainability assessment, as already prescribed in part at a federal level and in individual cantons, is a suitable mechanism to this end. This approach brings problems to light at an early stage and increases levels of acceptance among the population. Until now, however, there has been no appropriate tool for assessing the sustainability of hydropower projects. Researchers have now filled this gap.



Comprehensive assessment

Based on the sustainability assessment of the Canton of Bern, the scientists developed an appraisal tool to be applied to hydropower. The resulting grid contains 16 sub-areas with 45 criteria and a total of 150 indicators that measure environmental, social and economic effects. In two case studies in Ticino (Piottino) and Grisons (Lago Bianco), the researchers investigated the potential offered by this method, which also sees the involvement of the most important stakeholder groups.

The example of Lago Bianco on the Bernina Pass revealed that while there would be environmental impacts during the construction phase, capital would also flow into the region. What's more, the construction workers would boost the local economy with their needs. By providing a source of employment, a power plant also has a positive impact on the economy during its operating phase. A neutral or positive assessment is also produced when assessing the operating phase's environmental impact – back in 2008/2009, dialogue took place between all stakeholders, enabling all adverse environmental effects to be alleviated. This means that even in the event of low electricity prices – as has been the case in recent years –negative effects during the construction phase can be compensated by benefits in the operating phase.

An integrated sustainability assessment not only involves the analysis of effects, but rather also sees exchanges held between those affected – including the federal government, the cantons, operators, planners, environmental organisations and the local population – as well as the consideration of their views and appraisals. With an evaluation as comprehensive as this, it is possible to gain a broader view of a hydropower project. A project is deemed to be worthy of implementation from a social perspective if the outcome of the sustainability assessment is positive overall. This also includes instances in which a project is even deemed unprofitable from a purely financial viewpoint.



Water fees serve as leverage

The concessions and fees for the water – so-called water rates – are directly linked to the use of hydropower. These are currently being renegotiated at a political level. Over the coming decades, many hydropower concessions will also expire, meaning we are faced with an upcoming round of renewals. The researchers believe that this should be used as an opportunity to make adjustments aimed at sustainable development. For example, the grantors of concessions (cantons/municipalities) should receive appropriate rates, priority should be given to projects with “great sustainability” and the entire process should be structured efficiently. This goes hand in hand with the harmonisation efforts of the European Union, which requires the incorporation of sustainability goals for the granting of concessions. The researchers also point out that the fees for the use of water should not merely be viewed as a cost factor for electricity producers, but rather primarily be seen as resource compensation for municipalities and cantons.

More stringent regulation

To ensure that the hydropower industry’s expansion projects can gain majority support, the researchers recommend that politicians specify comprehensive sustainability assessments and involve the most important stakeholder groups at an early stage, as this increases acceptance. One possible means for doing so is the approach that has been developed within the framework of this research project.



Produkte aus diesem Projekt

- Framework for Decision-Making Process in Granting Rights to Use Hydropower in the European Context
Date of publication: 18.06.19
- Den Ausbau der Schweizer Wasserkraft nachhaltig planen und umsetzen – Lehren aus einem Stakeholderprozess
Date of publication: 18.06.19
- The Future of Swiss Hydropower: Is there money left some-where?
Date of publication: 18.06.19
- The Future of Swiss Hydropower: A Review on Drivers and Uncertainties
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