



Evaluating Economic Policy Instruments for Sustainable Water Management in Europe

## WP3 EX-POST Case studies Green Hydropower in Switzerland

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## 1. Presentation of the EPI



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## 1. Presentation of the EPI

### Background

- Growing environmental concerns in the 1990 in all of CH
- Strong public discussion on negative impacts of hydropower
- development of the green hydropower standard, which is based on scientific criteria and applied voluntarily
- The concept of the EPI “green hydropower” covers has two main objectives (EAWAG, 2001):
  - Economic objective: to have a reliable and objective certification scheme that is trustfully accepted by consumers and ensures fair competition on the market
  - Ecological objective: the improvement of local river conditions by setting an incentive to develop sustainable hydropower

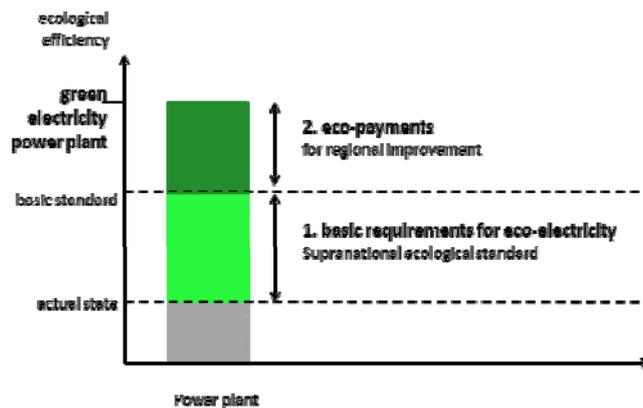


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## 1. Presentation of the EPI

### EPI design

- Two level payments:



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## 1. Presentation of the EPI

### EPI design

- Two delivery mechanisms:
  1. Standard covering 45 scientifically-defined criteria. They allow a supra-regional comparable certification of different power plants, regardless of their age, size, or how they are built or operated
  2. Eco-investment, financed by a fixed mark-up on every kilowatt-hour sold as green hydropower—on an annual basis, this surcharge must be re-invested in the river system in which the plant is located in the form of river restoration measures adapted to the demands of the individual river system. Currently 0.08 Eurocent (0.1 Swiss Rappen) per produced kWh and 0.7 Euro cent (0.9 Swiss Rappen) per sold kWh



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## 2. Assessment criteria



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### 2.1 Environmental outcomes – plant level

Needs assessment on a case-by-case basis, but examples show improvements in relation to:

- Hydrological character
- Connectivity of the river system
- Solid material budget and morphology
- Landscape and biotopes
- Biocenoses



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## 2.1 Environmental outcomes – national level

6.4 million Euro (8 million Swiss franc) for the period 2000-2009—main environmental investments made are:

- Revitalisation/connection and improvement of sediment transport in 24 km of rivers
  - Creation and restoration of aquatic and terrestrial ecosystems over an area of 950,000 m<sup>2</sup>
  - Improvement of sediment transport (2400 m<sup>3</sup>)
  - New natural hydromorphological structures
  - Improvement of fish habitats and other species depending on aquatic ecosystems
  - Reducing neophyte
  - Bird protection measures
  - Demolition of human-made hydromorphological structures
  - Cleaning and decontamination of land
- No (economic) valuation exercise of these benefits



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## 2.2 Economic assessment criteria

- Assessment mostly not possible as no information for most questions have been found
- Only some cost information for certification has been provided
- However as there is a positive trend in certification it can be assumed that the benefits outweigh the costs of certification



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## 2.3 Distributional effects and social equity

- Voluntary character of the EPI
- No significant distributional or social effects (employment, health etc.) for the hydropower sector
- Positive effects on education, as some of the money is used to pay for:
  - setting up a youth program “Viva-Riva”
  - information campaigns
  - training weeks in cooperation with the WWF



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## 2.4 Institutions

- Public discourse about hydropower led to the development of the label
- Combination of different institutions worked on the development (scientific, hydropower owner, green NGO, consultants)
- Led to a new institution which aims to:
  - Fund renewable energies and ecological energy products—this is mainly done through the development, promotion, and application of certification schemes and labels for ecological and renewable energy products
  - Develop scientific criteria for the assessment of ecological energy products
  - Co-operate with other organisations in Switzerland and outside



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## 2.5 Policy implementability

- Flexibility: consideration of local conditions for judging status improvement
- Public participation/cooperation and coordination between the other stakeholders:
  - public participation played a major role in the development of the EPI
  - In the certification process, a consultation with local stakeholders is performed
- Public acceptance: The continuous increase of certified hydropower plants can be seen as an indication of public acceptance
- Budgetary constraints: Are considered in the early stage and can be used as a criteria to step out
- Link to other policies: Supports energy and water policies



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## 2.6 Transaction costs

The following transaction costs have been identified but cannot be quantified:

- Costs of developing the certification scheme and criteria—an indication that these costs were high is given in Wustenhagen, et al. (2000) in the statement: “Especially the basic and the final design phase may require a lot of time and financial resources”
- Costs for developing a guidance provided to decision makers
- Costs for setting up the VUE
- Costs for maintaining the EPI in the frame of the VUE



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## 2.7 Uncertainty

- Uncertainty related to the environmental performance of certain mitigation measures applied at the plant level (effectiveness of hydrological mitigation measures)
- There is no uncertainty related to recertification. If a hydropower plant is certified once, it remains certified

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## 3. Conclusions

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### 3. Conclusions

The assessment of the Swiss EPI on green hydropower clearly has some strengths and weakness:

- The rationale for the EPI, its development process, and the environmental and educational impacts are well documented and analysed
- Other aspects such as transaction costs, economic impacts, and issues of social equity are not investigated

The green hydropower certification scheme can be seen as a successful instrument because:

- It has found its place in the market
- Its concept is considered in other places of the world
- It is used as a good example in the ongoing discussions about implementation of the WFD across Europe



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### 3. Conclusions

Further success criteria:

- Guarantees quality
- Label of sustainable electricity and electricity from renewable energy sources
- Combines the demands of different actors and stakeholders in the electricity and environmental sectors
- Improves the status of the environment on a broader level (basic requirement) but also considers specific local environmental issues (eco-investment payment)
- Establishes a competitive advantage for “greener” electricity from renewable energy sources compared to electricity from other renewable (e.g., non-certified hydropower) and non-renewable energy sources (e.g., petrol)



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