



Enhancing Sustainability Performance of Hydropower Plants

Lessons Learned from the First IHA HSAP Application in Europe

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Agenda

Introduction

Motivation to Apply the HSAP

Assessing Hydropower Sustainability

Creating Value

Better Investment Decisions

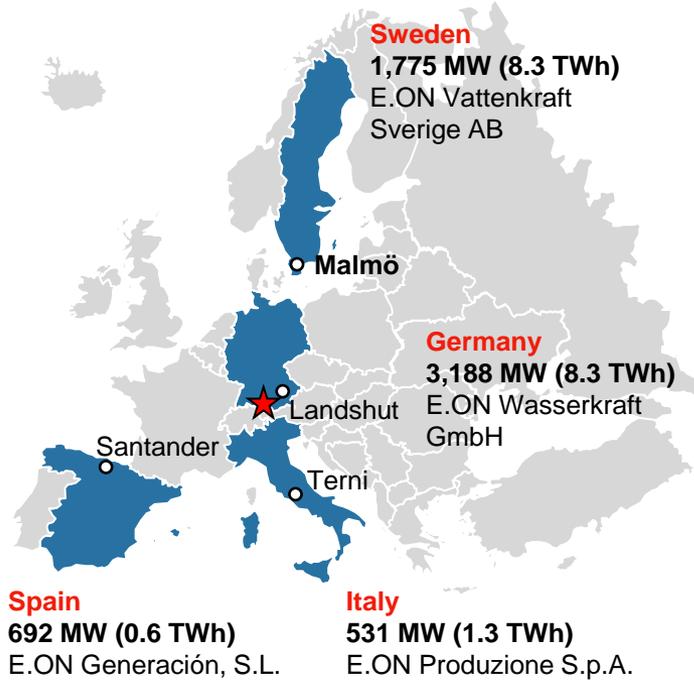
Conclusions

HSAP = Hydropower Sustainability Assessment Protocol

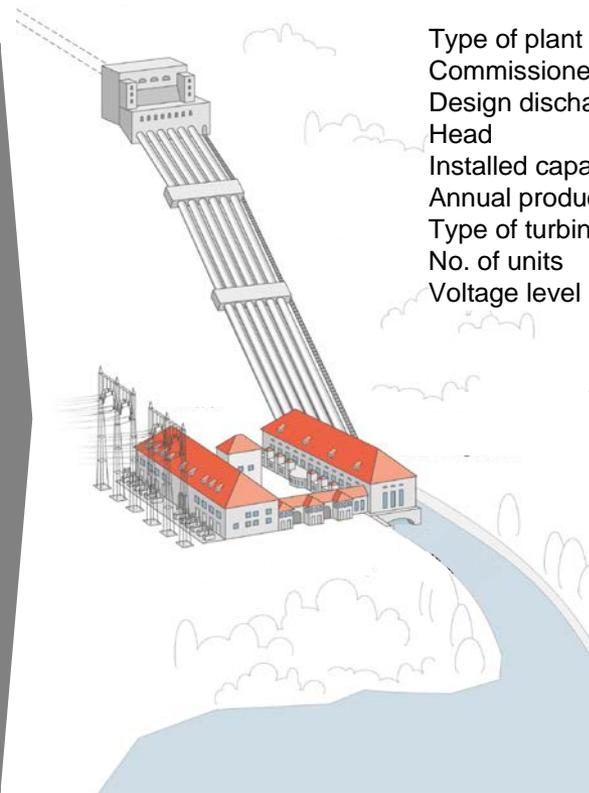
The E.ON Hydro Fleet applied the HSAP at the 124 MW Walchensee Power Plant in Bavaria, Germany

E.ON Global Unit Generation

- Hydro
- Steam
- Nuclear
- CCGT



Walchensee Power Plant



Type of plant	Storage
Commissioned	1924
Design discharge	84 m ³ /s
Head	197 m
Installed capacity	124 MW
Annual production	293 GWh
Type of turbine	Francis / Pelton
No. of units	4 / 4
Voltage level	110 kV

★ First European application of the IHA **Hydropower Sustainability Assessment Protocol**



Measuring sustainability performance not only promotes hydropower but also creates competitive advantage

E.ON's motivation to test an innovative sustainability performance assessment tool



Commitment to “**cleaner and better**” energy in accordance with **group-wide strategy**

Advancing sustainable developments as part of corporate responsibility initiatives

Promotion of a broadly endorsed international tool to **increase public acceptance of hydropower** technology

Create competitive advantage through **reducing project risks and environmental impacts** while **improving the firm's reputation**

Capacity building to organize Protocol applications in various environments in and outside Europe

Identification of sustainability performance gaps by using the likely high-performing plant as a potential control

Identification of opportunities to acquire a scoring level 5 (proven best practice)

Unlike other international guidelines, the HSAP manages to “define” sustainability by using a well-structured approach

Resources

50 KEUR
2 man months
Single-point-of-contact
Local support team



Background Document

Preparation Assessment Tool

Early Stage Assessment Tool

Implementation Assessment Tool



Operation Assessment Tool

- 2 days on site
- 3 days in the office
- Approx. 200 documents
- 30 interviews

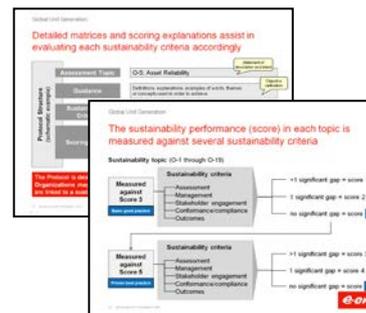
Assessment Week in February 2012

The Protocol **clusters** hydro **sustainability aspects** using precise categories.

Detailed **matrices and explanations** assist in **evaluating each sustainability criterion** accordingly.

Assessments rely on **documented, verbal, and visual evidence**, which is objective, factual, reproducible, and verifiable.

The scoring system allows project owners to **measure individual sustainability performance against international basic good practice and proven best practice**.



Output

Protocol Assessment Report

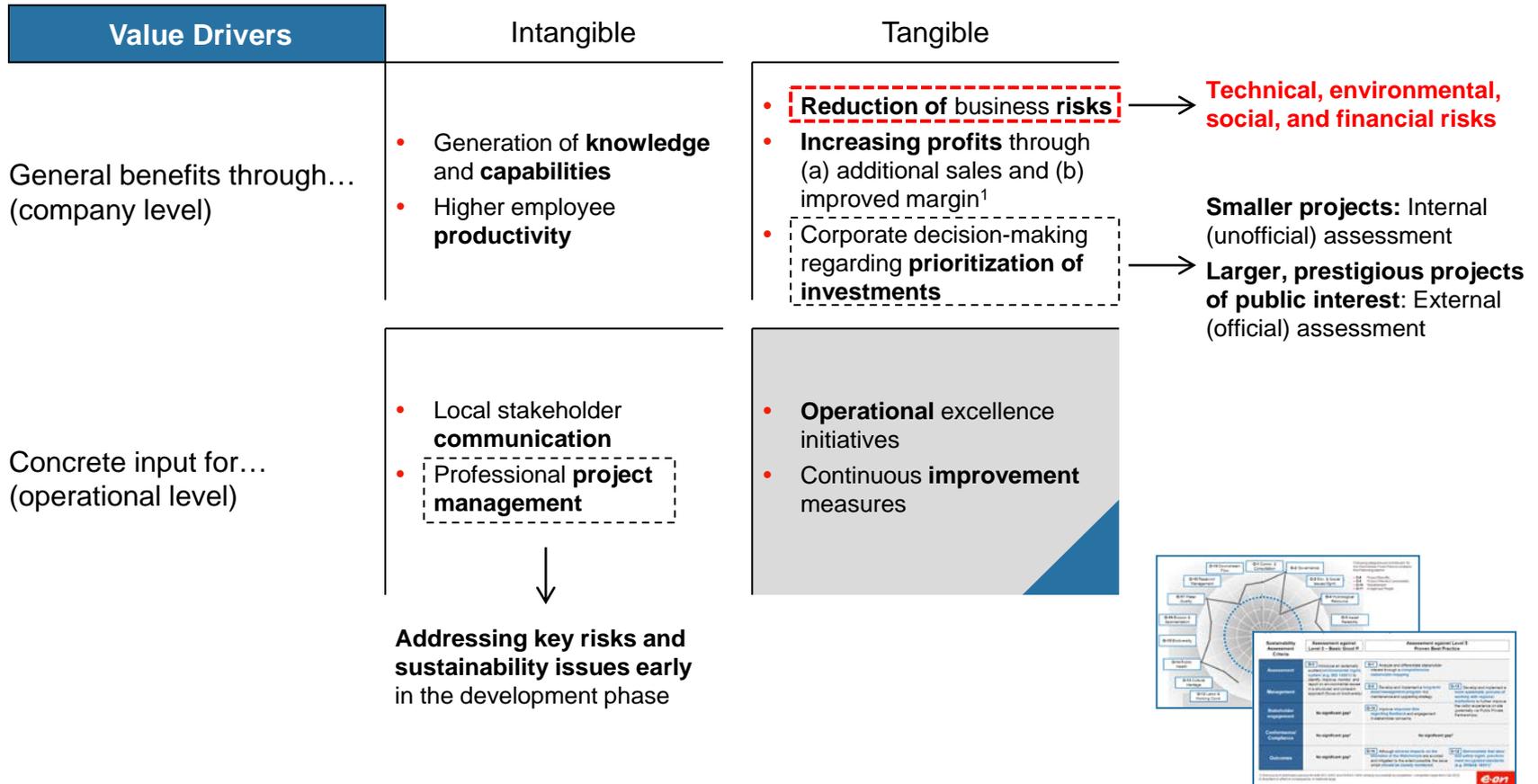


Comparative **results** are implicitly accompanied by concrete improvement measures¹ that **suggest possible ways to further advance** the hydropower project's **sustainability**.

1) That is, the requirements for higher scores as listed in the Protocol.



The Protocol primarily creates tangible value through its comprehensive search for sustainability-related risks



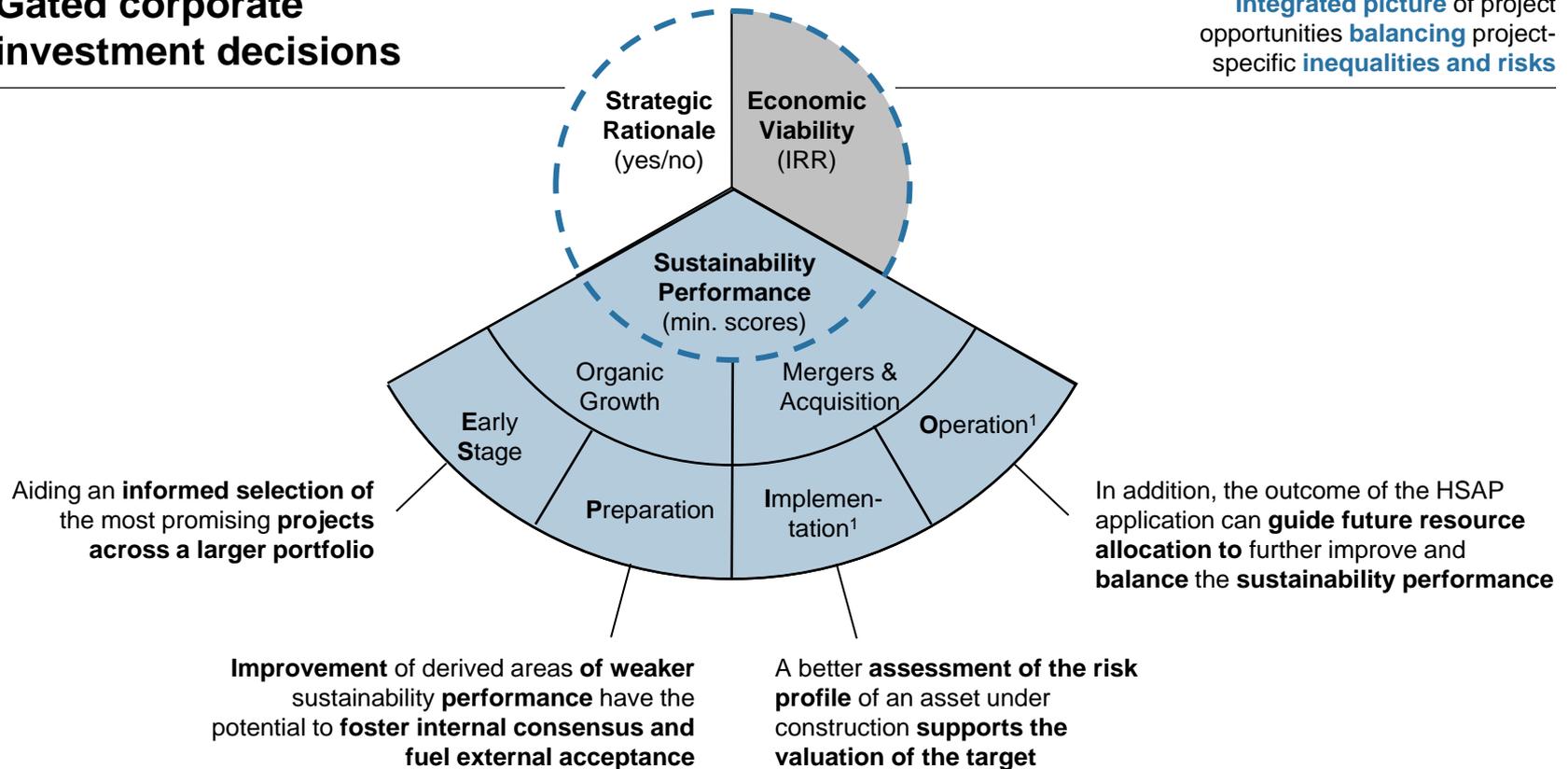
1) Increased customer's willingness to pay for 'sustainably produced' energy



Added to strategic fit and financial performance, a project's sustainability profile can be a third investment criterion

Gated corporate investment decisions

Integrated picture of project opportunities **balancing** project-specific **inequalities and risks**



Conclusions

-  The **HSAP** is capable of **objectively measuring** the **sustainability performance of** all types of **hydropower projects in any** given business and geographic **environment**.
-  Considering numerous individual topics, the produced **sustainability profile is compared to** what is internationally regarded as **basic good practice** and **proven best practice**.
-  **Lessons learned** from the first application in Europe **demonstrate that thinking critically about sustainability does create value** – particularly **at large-scale projects**.
-  The comprehensive **identification of risks** effectively **supports project managers** in their day-to-day business **and provides** concrete **inputs for** executives **prioritizing investments**.
-  Additionally, the **tool can be** usefully **integrated into gated decision-making processes** concerning green-field developments, acquisitions, and improvement of existing plants.
-  In short, the **Protocol helps to advance hydropower sustainability** – not only because of its comparative approach but also **due to its rich content addressing responsible actions**.