

WORLD
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WATER
WEEK

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www.worldwaterweek.org



Target conflicts and political will, how can priorities be aligned?

Johan Tielman, Environmental Manager, E.ON Vattenkraft

E.ON is an experienced operator of an European hydro power portfolio totaling more than 6,000 MW

E.ON Generation

Hydro

Steam

Nuclear

CCGT

No. of operated hydro power plants	212
Efficient capacity (net installed capacity) ¹	6,161 MW
Annual net generation ^{1,2}	18.5 TWh

HPP Hemfurth



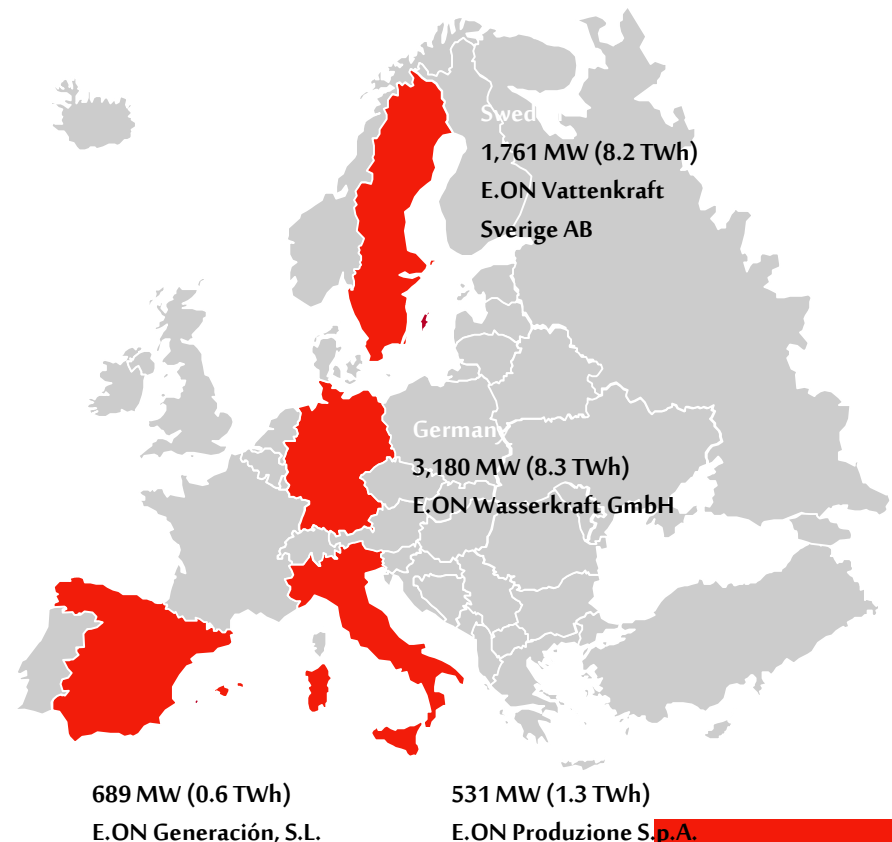
HPP Ramsele



HPP Cotilia



HPP La Remolina



1) incl. subscription rights

2) Annual generation excluding pumped storage power plants

The world stands in front of great challenges demanding new solutions to a sustainable development in the future

EUs target 2020



20 % reduction of greenhouse gas



20 % renewable energy



20 % efficiency of prime energy



→ Sweden aims to reduce the carbon dioxide emissions with 40 percent and increase the share of renewable energy with 50 percent until year 2020



Hydro power is a part of the solution

- CO²-free electricity from hydro power is necessary for national and international climate targets to be achieved
- The regulation capabilities of hydro power is required for large-scale expansion of wind power
- Export of Swedish hydro power displaces North European CO² power - the benefit of global climate and local environment



Environmental challenges for hydro power

The Water Framework Directive

2020 objectives

Natura 2000-areas

Bird- and habitat
directive

Introduction of wind and solar
=> more regulating capacity?

Flooding



Climate change

New environmental
legislation?

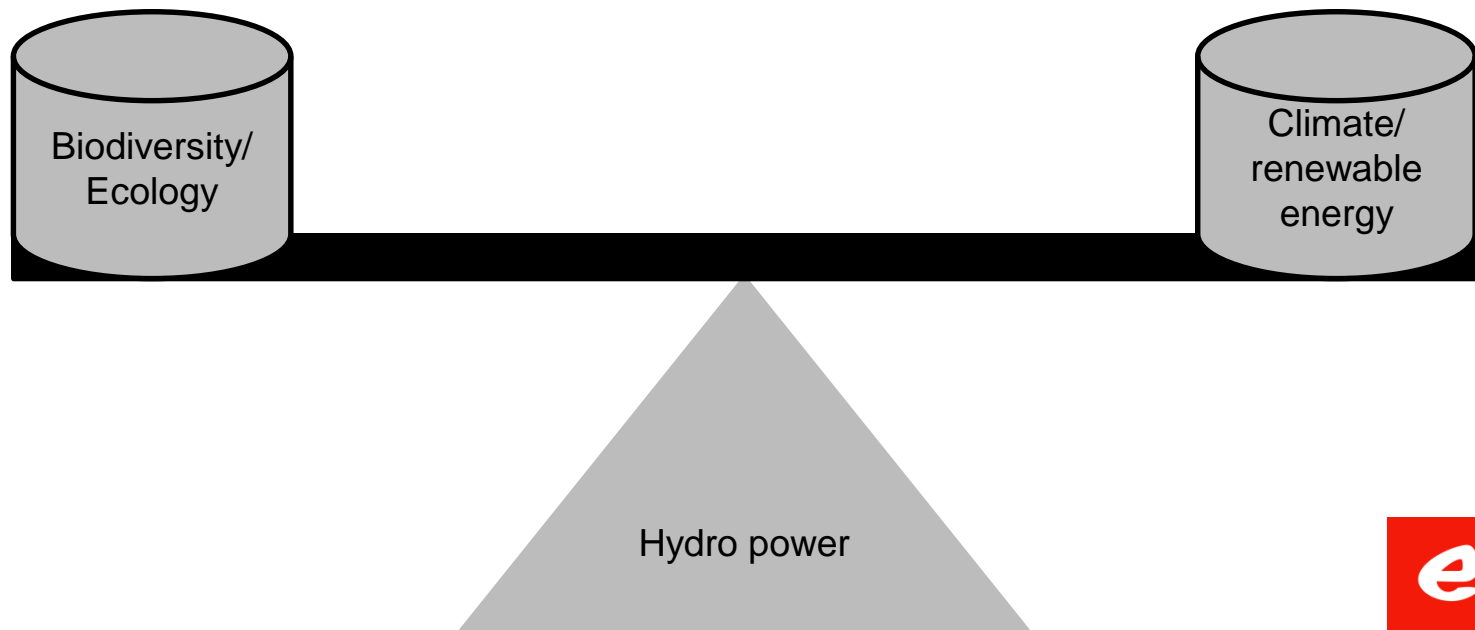
National environmental
objectives

Dam safety

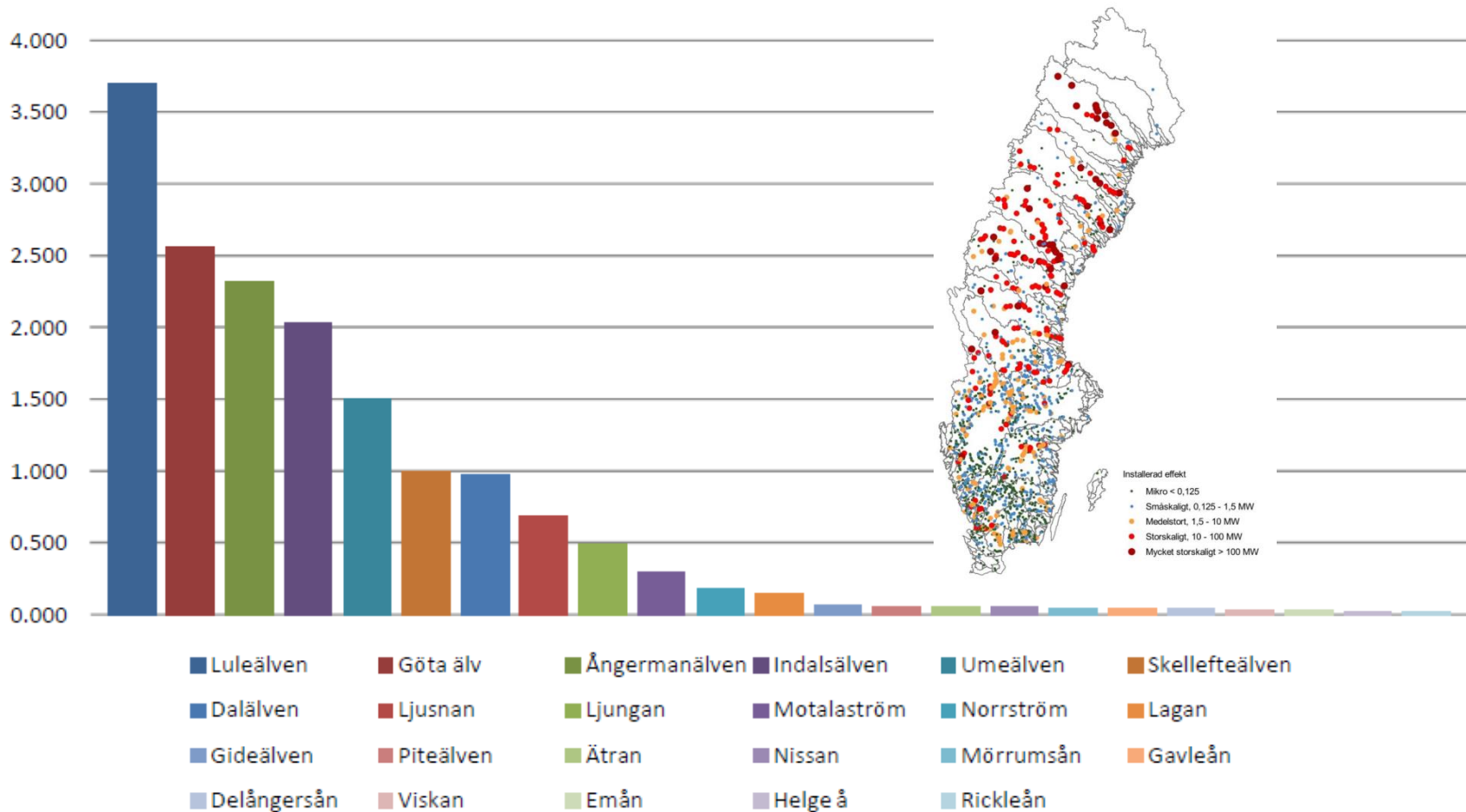
The EU Eel-
regulation

Hydropower, contradicting environmental consequences

- Contradicting binding objectives
- Measures for improved ecology may lead to loss of energy-generation and regulating power
- Expansion of wind- and solar-energy => increased regulation in large scale hydro => difficulties to reach ecological objectives



~10 % of HP-plants, or 9 river-systems, generate > 90 % of the energy and most of the regulating capacity

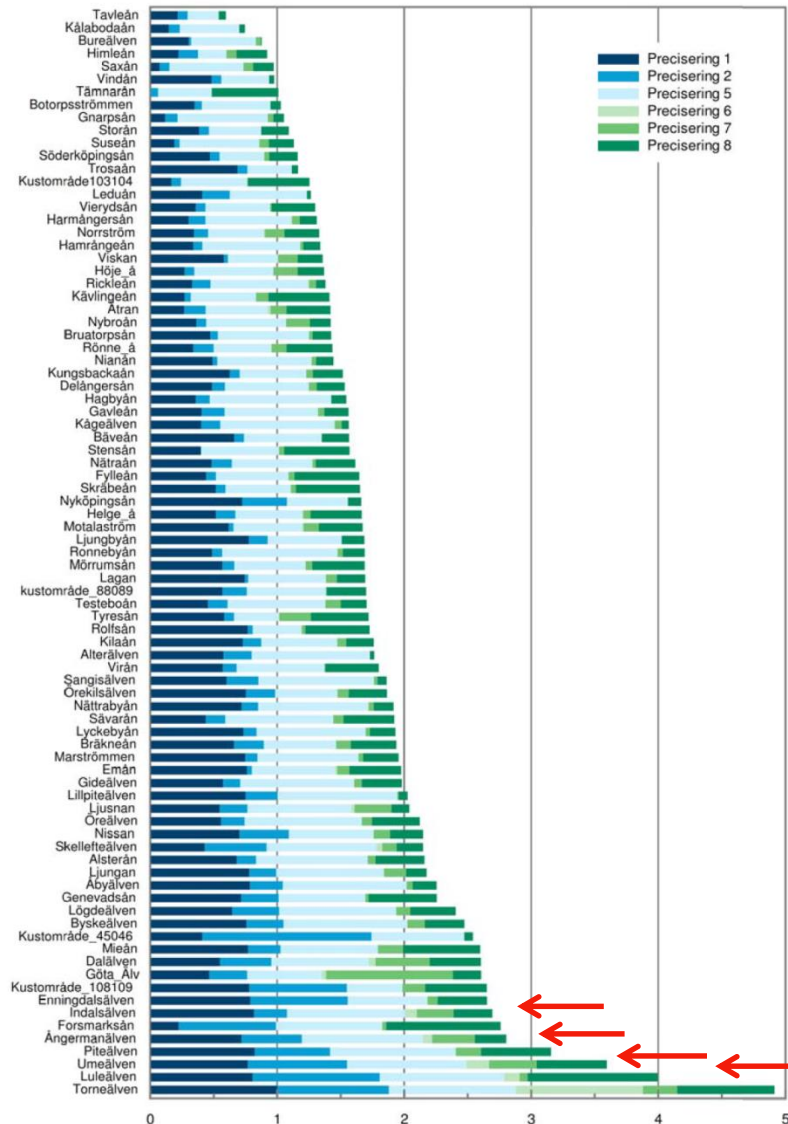


Source: Strategy for measures in hydropower, SWAM (Swedish Water Management Agency)

and SEA (Swedish Energy Agency)



Ecological ranking of river systems vid hydropower



High ecological values in river-systems with large scale HP, mainly in tributaries.

Source: Strategy for measures in hydropower, SWAM

(Swedish Water Management Agency) and SEA (Swedish Energy Agency)



Strategy for measures in hydro power, SWAM (Swedish Water Management Agency) and SEA (Swedish Energy Agency)



- Reference group with representatives from authorities, HP-industry and NGO's
- Not possible to reach all objectives everywhere but...
- Possible to reach objectives on a national perspective

Conclusion in the strategy:

- Maximum 2,3 % of the annual average generation, or 1,5 TWh can be taken into account for ecological measures.
- These measures shall not have a severe effect on balancing and regulating capacity.

Next steps

- From drainage-area to water-bodies
- How can we achieve as much biodiversity/kWh?
- Methods for cost-/benefit-analyzes needed.
- KLIV (Life and energy in our waters), a joint research-programme with participation from SWAM, SEA and the power companies will start during 2015.

Reflections from a producers perspective

- We are willing to support the national strategy as a cost- and time-efficient way to fulfill contradicting environmental objectives
- As soon as the strategy is implemented measures for improved ecology in prioritized rivers can be planned and realized.

Thank you for listening!



All plants are not equally important

Installed capacity	Number of HP-plants	Share of tot. generation
> 10 MW	208	94 %
1,5 – 10 MW	187	3,9 %
125 kW – 1,5 MW	680	2,1 %
< 125 kW	1030	0,5 %

Source Havs- och Vattenmyndigheten

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