

Constant Concessions under Changing Circumstances

The Water and Renewable Energy Directives and Hydropower in Sweden

Research in cooperation with CEDREN research center

Participation with funds from SIWI water and energy cluster group

CEDREN

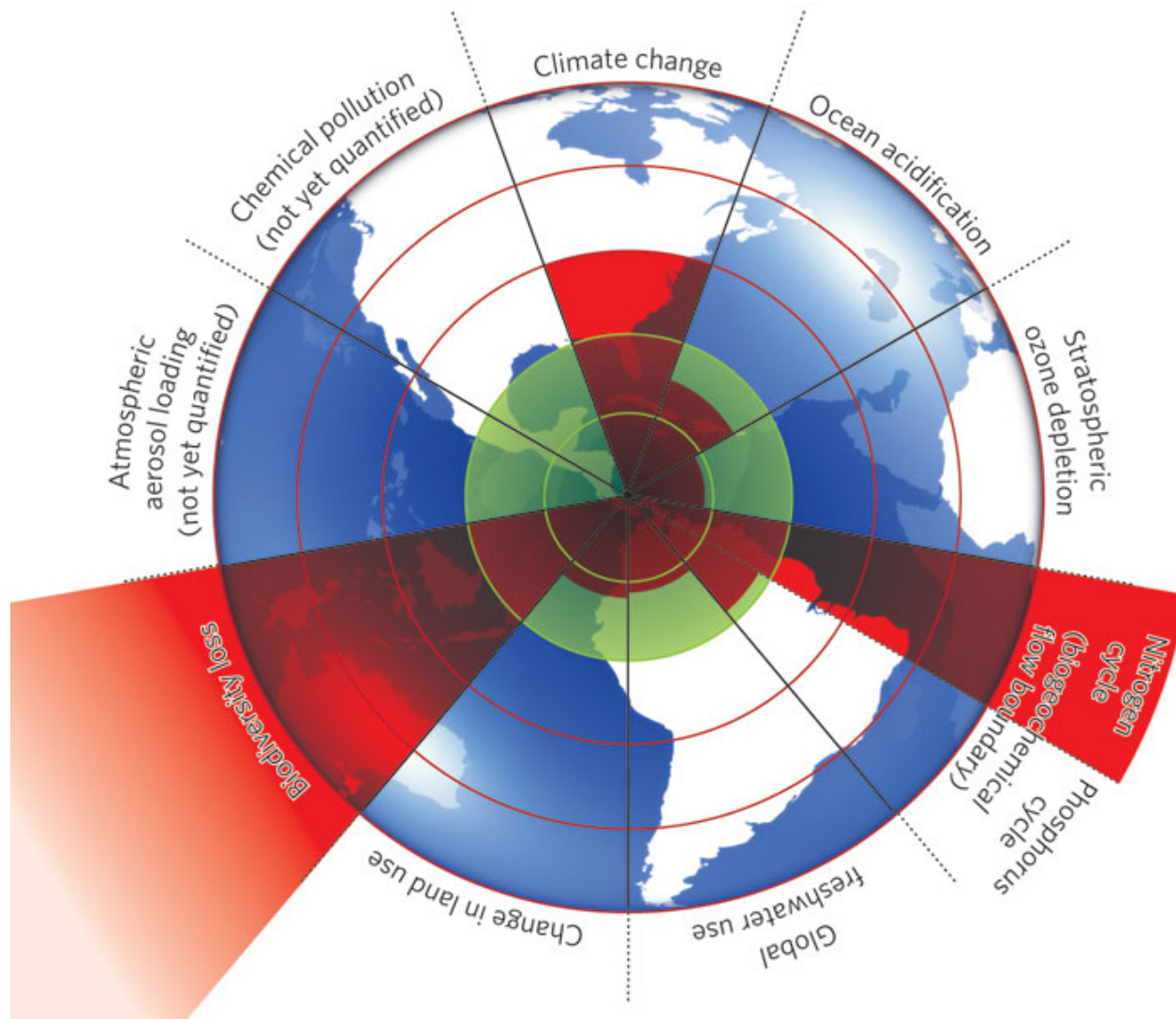
Centre for Environmental Design of Renewable Energy



SIWI

Hydropower in Europe

Country	Electricity gen. 2000 (% total)
• Norway	122 TWh (99%)
• Sweden	70 TWh (47%)
• France	67 TWh (13%)
• Italy	50 TWh (19%)
• Austria	42 TWh (78%)
• Spain	31 TWh (13%)
• Portugal	12 TWh (31%)



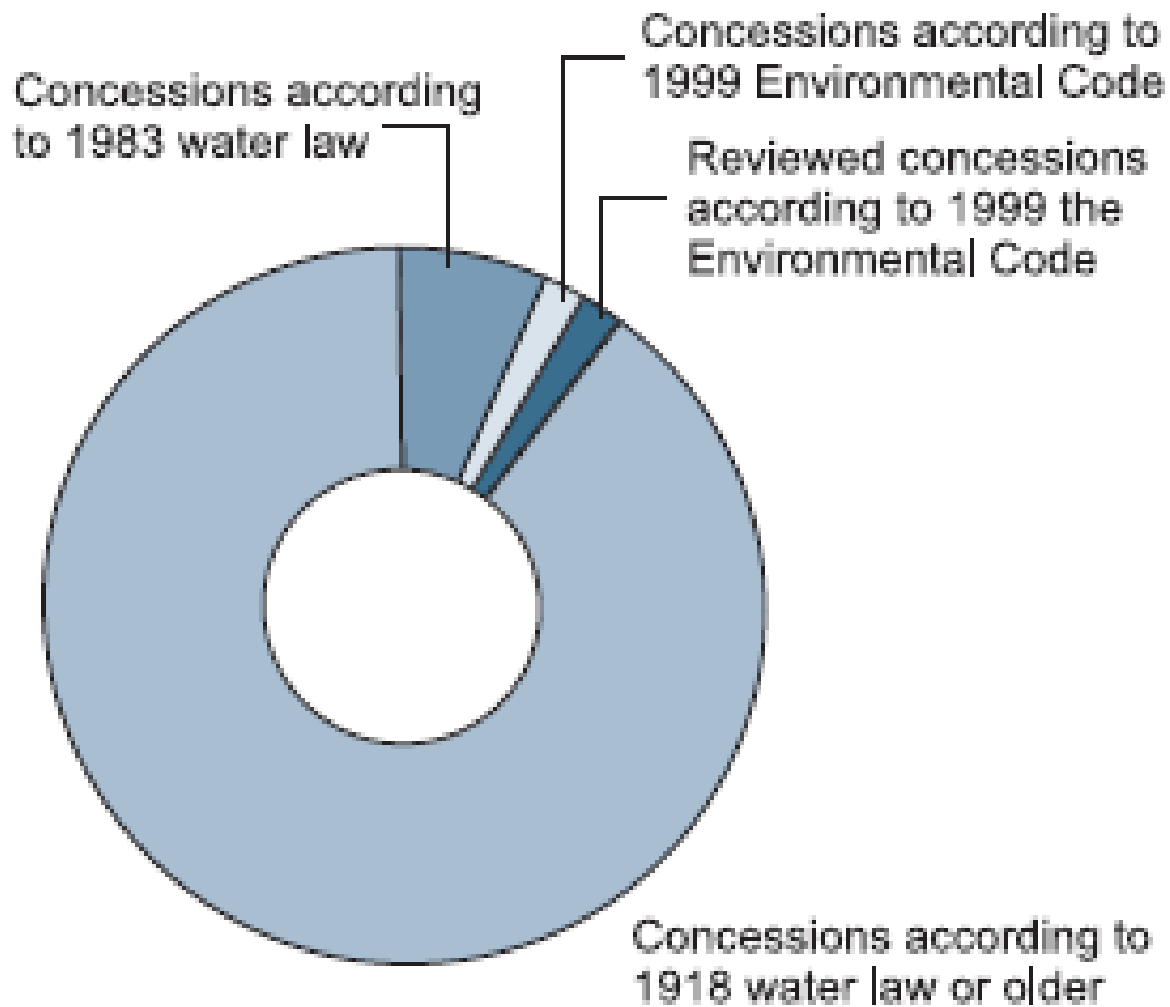
Source: Rockström et al. (2009) "A safe operating space for humanity" Nature 461

Implementation of RED and WFD in Sweden

- RES - Renewable Energy Certificates:
Expansion mainly wind and biofuels, support to hydropower
- WFD –Mainly administrative changes with new Water Authorities. Implementation in current system and with same tools as before WFD

Swedish hydropower governance system

- Highly judicial system with concessions that have legal force and no time limit
- Many generous concessions granting full appropriation flowing water (large inst. 70%)
- Judicial review initiated by authorities main tool to change current functioning
- High conflict and slow functioning of review process (2/3 resources administration)



Out of a total of 3727 hydropower station and dam concessions in Sweden

Current functioning and likely outcomes

- If implementation of WFD requires more than marginal change of hydropower sector current system will most likely not be able to handle it
- There are cases of limited refurbishments in order to stay within current concession. Can limit hydropower's share in the fulfillment of RES

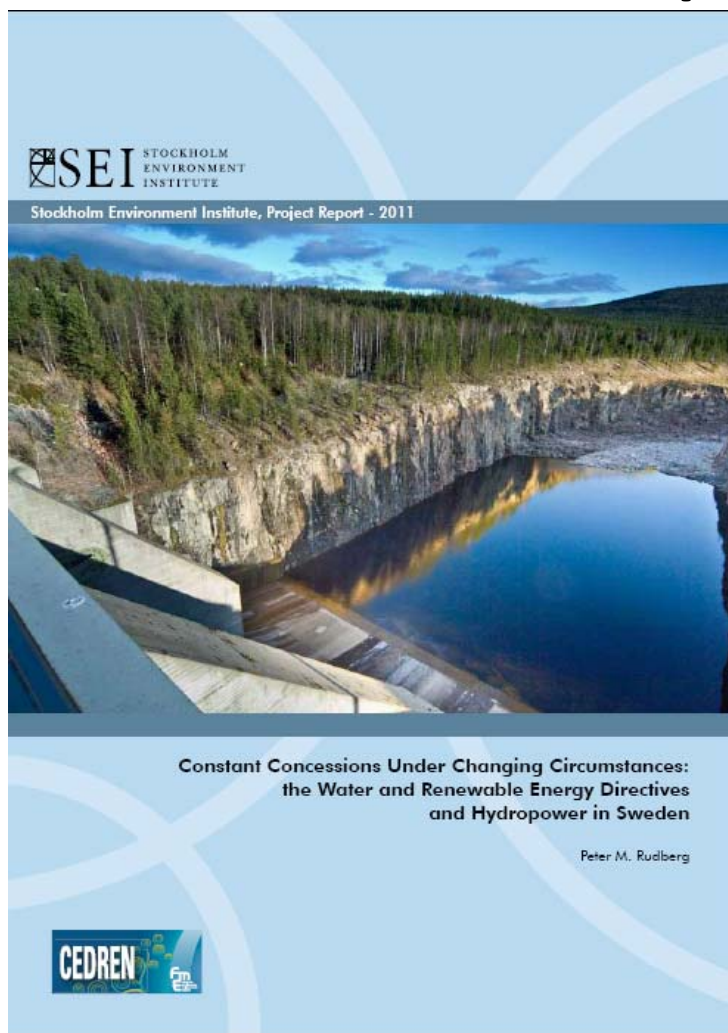
Win – win potential

- 300 Million Euro/ year refurbishment
- Calculated 5% efficiency gains simply from new turbines and generators. Examples of 50%, 70% and 114% efficiency gains!!
- Obligatory environmental fund for hydropower producers as a % of production value necessary. Change to renewable energy certificates desirable

General insights

- Speed and extent of implementation will depend upon different national systems of hydropower governance
 - Austria expanding hydropower and requiring installation of fish passage
 - Norway planning expansion of hydropower
- Potential for win-win and efficient resource use in other parts of Europe too

Gracias por su atención



El informe se puede encontrar en <http://sei-international.org/publications?pid=1884>

Estamos interesados en establecer cooperación para estudiar estas cuestiones en el sector hidroeléctrico del sur de Europa