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Closing remarks by Jakob Granit, Director General, Swedish Agency for Marine and Water Management

SUSHP Sustainability in Hydropower 2023 – Ecological mitigation, best practises and governance

Trondheim, Norway, 13-15 June 2023

- I am very glad to be able to provide some closing remarks to this terrific conference.
- On a lighter note, I think I speak of all participants in thanking you for your great Norwegian hospitality and all the arrangements you have made to make this conference a success.
- Extra thanks go to Professor Tor Haakon Bakken and Chief Engineer Jo Halvard Halleraker and your teams – we have seen you working very hard to teach us use the microphone and to manage us numerous presenters and moderators. A great task and always on time and with a smile!
- The entertainment has been first class with the conference dinner at the Royal Garden with the Beatles inspired band “Algorithm” and the beautiful music pieces played on the Grand organ at Nidarosdomen Cathedral.
- Again we are very happy that this conference is referred to as a follow up conference to the sustainable hydropower conference arranged in Northern Sweden in June 2019 arranged by my agency and the County of Norrbotten – we have established a good tradition.
- On a more serious note, let me provide some reflections on what we regard as key outcomes of the conference.
- First of all, from a theoretical and practical perspective related to management of HEP there have been many papers presented demonstrating that collectively we have much knowledge of how hydropower effects our ecosystem in the short term and in the long term.
- We have also identified research gaps which was clearly demonstrated during the poster presentation session by the PhD students. For example new research on accounting for biodiversity loss in reservoirs and the important role of riparian vegetation.

- At the same time we have also gathered knowledge on how to mitigate some of the negative impacts on the ecosystem. Practises presented in detail include rebuilding river systems continuum, re-creating connectivity for living organisms, overcoming fragmentation and restoring water dependent ecosystems to safeguard biodiversity.
- Papers presented in this conference provide solid evidence for this. The question we may ask ourself, however, is if a piece meal approach to making hydropower sustainable project by project is good enough? Can we move faster? Do we have governance and management gaps?
- Contrary to building the new blue economy in the marine space, that I referred to in my opening statement, for example through marine spatial planning, zoning and strategic environmental assessment for off shore wind, we do not seem to have that opportunity in our river basins.
- Secondly, in parallel to the effort put in place to reduce the impact of HEP on our ecosystems there is an increased demand for renewable and fossil free electricity production also serving electricity systems flexibility services.
- This was demonstrated in the Swedish case with the foreseen doubling of electricity production and at a global level with the tripling of electricity production from hydropower.
- This to meet the green energy transition as we heard in the EU and USA meeting our climate targets and the need to meet demands for modern energy in developing regions.
- We must also remember that according to the latest IEA data, the number of people around the world who live without electricity has risen by nearly 20 million in 2022, reaching nearly 775 million, the first global increase since the IEA began tracking the numbers 20 years ago.
- There are thus many efforts ongoing to build new sustainable hydropower, both very large hydropower to serve electricity needs and systems services on international grids as well as small scale HEP schemes.
- Papers presented demonstrate that the cumulative environmental effect of many small HEP can be larger than from larger HEP projects that also include pumped hydro.
- Even though northern Europe may gain more rain because of climate change weather patterns are also becoming more erratic and dry spells and even droughts are also becoming a new normal in Northern Europe. This topic did not gain much attention in the conference.

- Finally, you may recall that I in my introduction I called for a wider system approach in which we put the river basin and the catchment at the heart of the management of water resources – ecosystem based management. Multipurpose storage need more attention.
- It seems from several papers in this conference that we may ask ourselves if we are really successful in such an approach? Our common WFD which sets the governance framework seems to be implemented differently at the management level amongst the EU member countries.
- In some member states new hydro is being built in others there is a struggle to reach GES. The focus on water bodies rather than catchments and a high level of regulatory demands is a complex proposition to implement in many places.
- An even wider system approach is to understand the whole hydrological cycle from source to sea which was also raised during the conference. Management of hydropower plants and other barriers in the ecosystem is designed to increase the passage of fish such as salmon, the European eel and the Sea lamprey.
- But even if we succeed in restoring their river and lakes habitats fishing patterns also need to be managed in the open sea. The regulation of the Baltic salmon fishery in the open sea brought the salmon back to the rivers for spawning - a successful management approach – but for the sea lamprey that depend on large fish as a host in their life cycle their host is now over-fished.
- The source to sea context also brings the issues of important sediment transport to the coastal zone for erosion prevention and the transport of nutrients to the coastal system into the equation. At the end we are dealing with connected ecosystems which has been clearly articulated in the conference.
- In conclusion, this conference demonstrate that water resources are indeed a strategic resource for society and ecosystems. By focussing on a mature source of electricity generation, how to minimize its negative ecological impacts and innovate on its role in the ecosystem I am confident that we are moving towards much better management of water as an important public good by learning more on how to make the critically important hydropower sustainable.
- I thank everyone for all their hard work and the very inspiring research papers.