

IWA Webinar “Towards a Climate Neutral Water Sector: the Nordic Experience”

Post Webinar Report – 02/05/2023

Webinar available at: <https://iwa-network.org/learn/towards-a-climate-neutral-water-sector-the-nordic-experience/>

Questions received from participants during registration:

#	Questions	Speaker	Answer
1	How to link renewables with water sector's demand for energy in a smart way to minimize base line energy demand?	Anna Katrine	One way could be to make use of the inherent potential of storage in water systems, which allows for shifting when in time energy is used to move and treat water. This could be coupled to balance the electricity grid when there is a lot of renewable production (wind and sun).
2	How difficult is the monitoring and accounting, compared to solutions and implementation?	Anna Katrine	Good question! It depends on which post in the climate accounting is addressed and what precision is needed. Monitoring and accounting can be very easy, if it is based on already measured data and standard emission factors or very difficult if based on monitoring data that has to cover variability in space and time. The same, not very definite answer, applies for the solutions and implementation. Some are easy to do. E.g.

			changing the control structure if an online control is already in place. Others are very difficult, since they can be difficult to achieve do to other boundaries such as economic or policy measures.
3	What are the principles for an equitable GHG accounting in the water sector?	Anna Katrine	Difficult to answer. Envidan can compose an answer. There could be benefits in looking to other industrial sectors where CO2 taxation has been implemented.
4	Are there indications of specific categories in the value chain that appear to generally effect the water industry?	Out of scope	
5	How could a Carbon Credit scheme (e.g. audit system) work WWTW sites to move from current ops to decarbonise/improve (with min.?)	Anna Katrine	Difficult to answer. Envidan can compose an answer. There could be benefits in looking to other industrial sectors where CO2 taxation has been implemented.
6	Will the additional energy needed to remove PFAS chemicals impact the drive to reduce GHG in the sector? Is so by how much?	This was to some extent answered live by Alberto	Answered by Alberto talking about advanced treatment

Questions received from participants via the Q&A:

#	Questions	Speaker	Answer
1	Are there any studies into microplastics levels released in 'final effluent' as well?	Out of scope	Out of scope
2	Many thanks for the presentation. How should	Miriam	This was discussed by Miriam on the operations vs.

	<p>waste water operators become "carbon neutral", what kind of measures make sense, since a great part comes from infrastructure? Is it not about what kind of compensatory measures make sense, to counterpart simply necessary infrastructure?</p>		<p>Building/infrastructure/planning projects</p> <p>It varies depending on your activities, plants, location and how they are run. Key elements are:</p> <ul style="list-style-type: none"> - Energy efficiency, save as much as possible. This is also the case with transport related to construction, which takes up a lot of energy. Use electric vehicles if possible and demand the same from suppliers. - Demand materials with low carbon impact - Be smart on asset management and solutions, for instance wait with constructions, if possible, as concrete will have smaller carbon footprint in some years. Only exchanges pipes etc. if necessary. Nature based solutions for stormwater has a much lower carbon impact. - Produce carbon-free energy like heatpumps in wastewater/drinking water, use of surplus energy for district heating and produce your own electricity based on operations. - There are many opportunities, one is of course also to look at relevant compensatory measures. In Denmark, we plan trees to protect water resources, and this compensates carbon emissions. - There are many opportunities, learn from each other as is the purpose with the CSU project.
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3	<p>what about under reporting? a study from the US indicates for instance that Municipal wastewater treatment plants (WWTP's) emit almost twice the amount of methane than scientists previously believed, according to new research from Princeton University</p>	Amanda	<p>The work in the Nordics (in particular Denmark) has been most comprehensive on methane to date but the recent US work across 63 sites is very interesting - mostly being for aerobic AD facilities (unlike what we have in EU). We will discuss this in Webinar 2 (Methane!). A good background here is also our previous IWA Methane Masterclass and we will build on this! https://iwa-network.org/learn/process-emissions-masterclass-3/</p>
4	<p>Is than the separation of sewers system the way?</p>	Anna Katrine	<p>That assessment must be made from project to project. An LCA should be done looking into the costs related to creating that new infrastructure and possibly depreciate the existing one and weighing that up against the benefits in terms of energy and chemical consumptions, effect on receiving water bodies, etc.</p>
5	<p>Hi from the USA. Thanks for your excellent presentation. Dr. Pistrocchi, from a policy or technology perspective, what would you say are the top 1 or 2 things we should be urging our wastewater treatment plants to do?</p>		<p>live answered</p>
6	<p>We have seen a number of cases where increased pre-treatment for anaerobic digestion/energy leads to much higher N2O emission. Will the UWWTD draft not just increase the N2O emission with the 1-sided focus on the energy production for CO2 reduction?</p>		<p>live answered</p>
7	<p>Are there any collaboration projects to match up</p>	Anna Katrine	<p>https://www.danva.dk/media/8868/14-09-2022-the-road-towards-a-</p>

	nutrient recovery technology (for N ₂ O reduction/removal) and artificial fertiliser suppliers for N, P & K offtake to make wastewater more 'circular', rather than "disposing" of Ammonia/N to atmosphere via Anammox processes at WWTWs?		nordic-climate-neutral-water-sector.pdf In general N is "lost" to the atmosphere regardless of whether it is through "conventional" denitrification with COD or through the anammox process. There are technologies for recovering N into a fertilizer product that could substitute appliance of conventional fertilizers. So far all technologies are rather energy and/or chemical intensive, but they are getting more and more efficient. They are currently mainly applied at the reject water stream since this is where the ammonium concentration is high. There has been a lot of work on P recovery, which we'll refer to for further information.
8	what aspect of water quality testing is very important?	Anna Katrine	That depends on the purpose. In the context of GHG accounting, nitrogen and COD levels in the effluent can help give an indication of the indirect N ₂ O and CH ₄ emissions in the receiving water body, but in terms of most important emitters, it is more important to measure direct emissions on site at the plants.
9	Thank you for the presentation. You mentioned the "Factor 10" for emissions from Infrastructure compared to the operation of the system: Is that meant for an annualized comparison?	Miriam	live answered I have checked since the webinar. The Danish utility NOVAFOS has made an annual overview.
10	How relevant are the GHG emissions from sludge? What is the reason to leave these emissions out of the analysis/ modelling	Miriam	live answered Emissions from sludge are not in all Nordic models, but we propose to include them, and this is done in the models from Sweden and Finland. They may be checked for inspiration.

11	Miriam: Do you use a software for the climate models? Eg for LCA-figures?	Miriam	live answered
12	I am Daniel Ddiba, from the Stockholm Environment Institute. Can the Panelists share more about possibilities to include on-site sanitation systems in GHG accounting in the Nordic models? There's about 12 to 15% population in the Nordic countries who use on-site sanitations and I wonder if the emissions from these systems are seen as relevant to include in these climate accounts?	Anna Katrine	<p>They are included in the Danish national inventory reporting:</p> <p>http://oemmndcbldboiebfnladdacbfdmadadm/https://dce2.au.dk/pub/SR494.pdf</p> <p>where they seem to have a relatively big impact. However, there is a lot of uncertainty attached to the used the emission factor, since it is only based on measurements from two sites. It would be relevant with a more data and information on this emitter.</p>
13	Hi! Jenny Åström from Sydvatten here, a water utility in Sweden. We calculate GHG from all our construction work, both in an early phase and in a later phase. Construction is about 3-4 times higher than an operational year for us at the moment. In the early phase we use calculations for strategical choices, example material choice, and can reduce the impact significantly with this new knowledge. I am happy to share this sometimes.	Amanda	<p>Jenny thank you so much for this!</p> <p>Maybe you could support our final webinar on LCA - it would be great to get these examples publicised more!</p>
14	Many thanks for the presentation. What software would you recommend as a database for emission factors?	Natalia	live answered
15	Surely the big wins are on process emissions and final usage emissions / comparators (i.e. when	Anna Katrine	Thanks for the comment

	<p>used on land), so with parameter assumptions clearly stated upfront, then a given LCA should always be for the whole 'system', otherwise we're not accounting for the biggest impacts and therefore not acknowledging where the biggest wins can be achieved, which is essentially to help steer policy, subsidy, design, investment etc. The planetary issues and cycles are well known, so we shouldn't be shy on stating LCA scores, whilst we should also (e.g. trade associations etc) establish some norms/standards on defining parameters and [ambitious] boundaries?</p>		
16	<p>How did you see the challenges on agreeing on a baseline (to get the helicopter view to start with) between 4 countries? Here in Africa, it is a huge challenge</p>	Jacob	<p>This is quite a challenge in the Nordics also, even though the countries in many ways, seem quite similar. We had a lot of discussions and came to a common baseline, but at the same time adding some room for country-specific parameters.</p>
17	<p>Can you elaborate, if possible, why you use the ISO standards instead of the GHG Protocol? did you pick the one over the other?</p>	Natalia	<p>We are already ISO 9001 and ISO 14001 certified, which makes it easier to use other standard from the ISO-family and just build on them. We do nevertheless use methodology from GHG protocol but not in such details. We divide our emissions and define them in accordance with Scopes 1-3. ISO IWA 42:2022 also combines approach from ISO-family with GHG Protocol methodology. I just think that it is much easier to start with something we already know and understand instead for trying to build</p>

			a new system from scratch. GHG Protocol is also very detailed and technical and may be overwhelming for someone who just starts working with climate- and energy aspects.
18	Hi - maybe correct what Michael stated - but guess also that progress in understanding how to limit NO2 development, (based on advanced process control) show that we both can become energy and climate neutral		That depends on the purpose. In the context of GHG accounting, nitrogen and COD levels in the effluent can help give an indication of the indirect N2O and CH4 emissions in the receiving water body, but in terms of most important emitters, it is more important to measure direct emissions on site at the plants.