

# Report from a Workshop held during IWA World Water Congress & Exhibition in Copenhagen, 14 September 2022

## The Road to a climate and energy neutral water sector



The workshop was initiated by the four Nordic Water and Wastewater Associations: DANVA, FIWA, Norwegian Water and Swedish Water, and facilitated by Pär Dalhielm, CEO, Swedish Water and Marie Rødsten Sagen, Chief Engineer, Bergen Water, Norway

### Workshop Programme

#### Workshop introduction:

*Pär Dalhielm, CEO, Swedish Water and Marie Rødsten Sagen, Chief Engineer, Bergen Water, Norway*

#### Presentation of Nordic principles for climate neutral water sector:

*Jacob Kragh Andersen, Envidan, Denmark*

#### Short pitches – examples of experience from utilities

1. *Kees Roest, KWR, Netherlands*
2. *Amanda Lake, Jacobs, UK*
3. *Nicolas Lesur, Director for Wastewater Services, Grenobles Alpes Metropole, France*
4. *Felipe Andres Sanchez Ihl, Aguas Andinas, Chile*

5. *Natalia Adamczyk*, Bergen Water, Norway
6. *Morten Rebsdorf*, Aarhus Vand, Denmark
7. *Sara Ekström*, VA Syd, Malmö, Sweden
8. *Anna Kuokkanen*, Helsinki Region Environmental Services HSY, Finland

World café – discussion with presenters at tables.

Feedback from tables and wrap-up discussion, facilitated by the two workshop chairs and invited expert Jacob Kragh Andersen

### **Workshop contributions, input from round-table discussion and key messages:**

#### **Jacob Kragh Andersen, Envidan, Denmark**

Presentation of joint Nordic report on the road towards a climate neutral water sector in the Nordic countries. Key messages from this work include:

1. Select the key parameters that are most relevant for your utility and/or national model
2. Establish a baseline of emissions
3. Set an ambitious target for when to achieve climate neutrality
4. Track progress towards the target
5. For a start – focus on largest emissions from the sector (Minor emissions, supply chain and construction may come as a next phase)

This is possible to achieve, and the Nordic project aims at further cooperation on the road towards climate neutrality in the Nordic, European and global water sector.

#### **Kees Roest, Senior Scientific Researcher, Energy & Circular System, KWR, the Netherlands**

Working at handling climate neutrality within the circular economy. Has developed a dashboard for circular economy that includes physical and socio-economic dimensions. Circular economy is seen as an economy that handles products, materials, and resources efficiently to ensure life for future generations, so in a socially responsible manner within ecological preconditions (including climate neutrality). The ambition of Netherlands is to be 100% circular by 2050.

#### **Amanda Lake, Jacobs, Head of Carbon and Circular Economy, Water Europe, UK and Ireland**

Presentation of experience from the UK and Irish water sector. Carbon accounting has been done since around 2005. In 2019 a pledge was made to reach net zero 2030, and the sector has established a baseline for scope 1 and 2. In future the biggest emissions will be nitrous oxide and methane. We need to work with science-based targets to overcome challenges. Individual companies focusing work on process emissions given their transition to renewable energy. Amanda leads the IWA GHG monitoring sub-group within Climate Smart Utilities – new members are welcome; we purpose to share good practice and we are currently producing a white paper.

#### **Nicolas Lesur, Director for Wastewater Services, Grenobles Alpes Metropole**

Experience from Grenoble, wastewater handling and treatment. Nicolas presented an overview of actions implemented, planned and to be initiated in future. Climate neutrality achieved in 2018 (without accounting for N<sub>2</sub>O). Actions to date include heat recovery, biogas productions for city grid, and reduction in carbon footprint through removing chemical consumption. Planned actions include transformation of CO<sub>2</sub> to CH<sub>4</sub> through methanation, further reducing electricity consumption and using artificial intelligence

to improve performance of electrical equipment vs consumption. Future actions include reducing N<sub>2</sub>O emissions from the process. These were underestimated and it needs to be handled in the future.

**Felipe Sanchez, Head of Rural Water Services, Aguas Andinas, Chile**

Presentation of steps to achieve climate neutrality in Aguas Andinas. First action has been to establish a baseline, then to set targets. It is important to choose your fights, you cannot do all in one year. It is important to change patterns and paradigms, get actions going. They aim to look into energy production, circular economy perspectives, energy efficient and low-impact technologies, and eventually involving the supply chain. There is a need for a paradigm shift, and it is also important to look into incentives and communication activities.

**Natalia Adamczyk, Senior Engineer, Bergen Vann - Bergen Municipality's Water, Wastewater and Urban drainage Utility, Norway**

The utility started working towards climate neutrality in 2018, but still lack some work. Their recommendations are first to know your value chain, then to identify significant emissions. Calculation of emissions in itself is not much, but need to put them in context, make part of the utility's activities. Since 2018 Bergen Vann has managed to reduce emissions by 30%.

**Morten Rebsdorf, Senior project manager, Resource facilities, Aarhus Vand A/S Denmark**

The Danish context is that utilities are facing CO<sub>2</sub>-tax, and a demand to be CO<sub>2</sub>-neutral and net energy producing in 2030 implies a dilemma. Aarhus Vand have been producing energy for many years, and one of our WWTP's is energy positive. The reduction of emissions, primarily N<sub>2</sub>O and methane is crucial for enabling CO<sub>2</sub>-neutrality in 2030, hence we are doing research projects on this topic. Aarhus Vand is considering energy efficiency in every project. Change in sludge disposal methods and afforestation are also work in progress.

**Sara Ekström, Development engineer, VA SYD, Sweden**

At VA Syd they are monitoring GHG-emissions from open basins. Anna presented different tools used in this process. How to perform measurements is important. N<sub>2</sub>O reduction is also important when looking for ways to alter the carbon footprint. The result is a reduced carbon footprint of 17-20% depending on the IPCC emission factor used.

**Anna Kuokkanen, Project Manager, Helsinki Region Environmental Services Authority HSY, Finland**

Presented total nitrous oxide emission data for several years from an underground municipal activated sludge plant. The data showed how large the yearly variations can be during normal years and particularly during disturbances in nitrification, emphasizing the need for continuous measurement for reliable emission calculations.

**After pitches, presenters went to tables go discuss and give more detail on their cases.**

**Feed-back from table discussions:**

**Table 1**

Incentives are important like Danish carbon tax. There it a need for research and knowledge, and for presentation of climate positive utilities, collaboration and thinking ahead.

**Table 2**

Discussed benefits of having a solid road map for reaching climate neutrality. Utilities must develop their own, and then share experience with others, also on tools and methodologies. There is a need for carbon

pricing and similar incentives. The impact of the energy crisis will help provide business cases for renewable energy. Energy efficiency is important.

**Table 3**

Solutions may be individual and there is no silver bullet, but the same way of thinking and methodology may be followed all over the world. The price of energy has an impact.

**Table 4**

We need a paradigm shift, no more status quo. Water utilities normally stay out of news, but now we must start telling our stories, and we must make some noise. If we do not have a crisis, we still need to make a good story. Not so easy. Important to bridge decision making with solutions, storytelling can help get people in same direction. Not easy, but once you share the same story easier to get people to go in same direction.

**Table 5**

There is a place for a common model for developing climate footprint calculations. This should include some easy guidelines and step-by-step models. Energy is a big topic, and it is important also to include other measures for climate neutrality, like biogas production.

**Table 6**

Had a more technical focus, and more research is needed. We need a lot of data, calculation and guidelines, and we should be better in sharing information.

**Table 7**

On how to get this representative carbon emission factor, more research needed. But also need for guidelines for different measurement systems and which to use. Guidelines for process solutions are also relevant. This takes a lot of effort, so how can we do this with minimum effort. We must learn to combine models with AI.

**Table 8**

Discussed measuring methods for N<sub>2</sub>O, our largest cause of emission. How can we reduce emissions while removing nitrogen? You must know your own processes; monitor you own emissions and find out what is relevant for your utility. Challenging and important.

**Wrap-up of discussions was done by:**

**Marie Rødsten Sagen, Bergen Vann, Norway**

Key messages are that it is important to get an overview of emissions for each step of your value chain, and for this more data and research is needed. Just to get an overview is not enough. We need roadmaps and a systems approach, need context specific solutions. And its strongly recommended to include indirect (scope 3) emissions. There is a need for paradigm shifts, and that we can make a link between decision making and solutions.

We need to cooperate and share our knowledge.

We are in a hurry; more action is needed now.

**Jacob Kragh Andersen, Envidan, Denmark**

We had good discussions, and broad ones on the political agenda, and systems for climate accounting models, but also on details, different solutions, models.

We need more incentives. And a well-functioning CO2 tax could be one of the incentives. There is a need for:

- Common methodologies and guidelines to start from
- More data
- Sharing information is important. We can take advantage of common models
- Emissions factors are guidelines, but all utilities are different, and need specific ways to develop the solutions for their places.

Most if not all that was said here is in line with the Nordic report and recommendations there.

We need to start looking into construction phase also, and we must start to do so now. We must build better.

## THE ROAD TOWARDS A NORDIC CLIMATE NEUTRAL WATER SECTOR



*Photo by Jani Wihinen, Jyväskylä Region WWTP Plant Ltd, Finland*