



## THE VIEW FROM THE UTILITY

# Small but mighty: how leading utilities are taking circularity to the next level

Newly inaugurated members of the Leading Utilities of the World group NSVA and Barwon Water are paving the way on circular economy initiatives despite their relatively small size, which turns out to be an advantage in stakeholder engagement.

**A**lthough they operate on opposite sides of the globe, Nordvästra Skånes Vatten och Avlopp or NSVA (from Malmö, Sweden) and Barwon Water (from Victoria, Australia) are both spearheading innovation in circular technologies and stakeholder engagement. On the first day of Amsterdam International Water Week 2023 this month, both utilities were inaugurated into Leading Utilities of World thanks to their innovations.

Both utilities are focused on extracting as much as they can from their wastewater. NSVA has developed the world's largest source-separated wastewater treatment plant, RecoLab, which was crowned wastewater project of the year in 2022 at the Global Water Awards. With this facility, NSVA wanted to push boundaries and try things that may not work. "Recolab is

a test facility," said Ingemar Clementson, Head of Digital at NSVA. "We are supposed to fail, so we can then test technologies and demonstrate scalability." Connected to the Oceanhamnen housing district (population roughly 3,000) the "three-pipe" system collects greywater and food waste through gravity sewers and blackwater through a vacuum sewer. Thanks to source separation and the cutting-edge technologies tested at RecoLab, the plant can recycle 80% of the water to drinking water quality, generate more biogas and extract more phosphorus and nitrogen than single stream plants.

At Barwon Water too, the utility is thinking outside the box to get the most out of its wastewater. By treating not just sewage sludge but also food and garden waste, Barwon Water is able to generate biogas, biochar and fertiliser pellets.

According to Shaun Cumming, managing director of Barwon Water, the expansion to other forms of waste unlocks more resource recovery: "all the wastes have their own speciality. Food waste is good in its biogas capability, garden waste has good carbon content for biochar, and of course biosolids is good in its nutrients content. You get a better product by being able to blend the different waste sources."

Cumming is also interested in exploring co-location of wastewater treatment plants with other facilities to maximise resource use. The production of energy, heat and fertiliser from wastewater has huge potential for greenhouses. Barwon Water already collaborates with agribusiness firms interested in its biochar and fertiliser, and collocating greenhouses closer to wastewater treatment plants could be ►

the next step to maximise the benefits.

Similarly, Barwon Water has teamed up with a hydrogen plant in Geelong to provide recycled water. Producing hydrogen requires energy as well as water, both of which wastewater treatment plants can provide. “I want to start a new classification called fluorescent green hydrogen,” said Cumming, “which uses both renewable energy and recycled water.” What’s more, hydrogen generates oxygen, needed for aeration in wastewater treatment plants.

### Diverse drivers

Barwon Water’s zero waste and net zero emissions by 2030 goals are driving the utility’s focus on circular technologies. Biogas production can significantly reduce utility scope 2 emissions, and biochar sequesters carbon. However, the resources can also serve as alternative revenue streams. “The whole idea is to get the highest possible value out of waste,” said Cumming. “Currently the model is reliant on charging waste fees and getting very little for your end product. We want to get high-end product which is revenue stream that benefits our community and keeps rates low.” For example, activated carbon from biochar could be sold as a high-value product to make sodium-ion batteries - although the utility is not yet generating revenue from this.

In Sweden, regulations do not yet enable NSVA to pursue direct revenue streams from resource production, although Clementson hopes that will change. For the utility, pushing forward with the technology is a way to influence both regulators and the supply chain. “When we first started, there weren’t many products that were commercially available to us,” said Clementson “So we are hoping that the market wakes up, that vendors see there is an opportunity here and next time we what to build another facility more vendors will be able to provide us with technologies.”

Ultimately, investing in circularity is about resilience. Faced with a growing population and increasing water resource uncertainty due to climate change, Barwon Water reckons self-generated energy and recycled water as well as alternative revenue streams will shore up its resilience. NSVA does benefit from a much wetter climate, but knows it needs to be prepared: “in the area we are recovering water [with Recolab], we do not actually have water scarcity,” said Clementson. “But we know we are going to start facing water scarcity in other areas in the years to come.” In other words, Recolab is the proof of concept for the utility’s resilience.

## NEW FACES

Shaun Cumming (right), managing director of Barwon Water and Ingemar Clementson (second from right), head of digital at NSVA, accepted their Leading Utilities of the World trophies at AIWW.



Source: GWI

### Small and nimble

NSVA and Barwon Water serve 275,000 and 370,000 customers respectively, making them relatively small utilities within the Leading Utilities group, which includes utilities serving several million customers. According to Clementson, “the major challenge with being a small utility for us is that we need to work very hard to be open for collaboration. To be able to get into European collaborations or big research projects, you usually need a bit of a volume, so if we can’t collaborate with other utilities, we won’t move forward on a lot of questions or issues.”

NSVA has teamed up with two larger utilities, Va Syd and Sydsvatten, to found Sweden Water Research, an R&D company aimed at researching advanced solutions for the water industry. But when it comes to implementation, NSVA’s small size gives it the edge according to Clementson: “we can be light footed when it comes to making changes within the organisation or within technical tools. We have the possibility to adapt fairly quickly. [...] From field work the step up to CEO management and change levels is not that far. Being closer to the problem owner to identify problems is an advantage.”

For Cumming, being a smaller utility means stronger ties with the community, both from a domestic and industrial standpoint. Barwon Water’s service area includes the city of Colac which is a significant beef, lamb and dairy manufacturing hub. The utility teamed up with the Australian Lamb Company and Bulla Dairy Foods to produce biogas from their waste, enabling them to take Colac’s wastewater treatment

plant off the grid. Heat was also collected and given back to the food manufacturers for their processes. The utility was able to test out circularity with an industrial partner, and the project served as a catalyst for exploring a similar project in the larger city of Geelong with domestic waste. On the domestic side, Cumming said that being a smaller utility means it is easier to engage with the community: “we can really open ourselves up, anyone who wants to talk to the project team can come in and talk to the project team. We have outreach in schools, community groups and markets, etc”

### Getting the word out

Indeed, stakeholder engagement is crucial for these utilities. According to Cumming, community engagement “has created the social license” to engage in innovative circular technologies. “Ten years ago when we did the biosolids facility, people were getting their heads around recycling,” said Cumming. “Now people are asking when more initiatives will be up and running. There’s a real narrative around their waste being recycled for their benefit.”

In Sweden, NSVA’s Recolab isn’t just a testing facility, it’s also a showcase. The facility also has a venue space, where talks, events and conferences can take place and the utility can host stakeholders to showcase their innovations. “To get decision makers on board, if we don’t have a venue, if we don’t have a case, if we’re not good at presenting what we are good at and what we are bad at, it’s very hard to get them to get political and decision-making attention,” said Clementson. ■