

Renewable energy

Australian water utilities



The Australian water sector is a large energy user during the supply, treatment and distribution of water. Energy use is heavily influenced by the requirement to pump water and sewage and by sewage treatment processes. To avoid challenges in a carbon constrained world, future utilities will need to rely more on renewable sources of energy. Many utilities already have renewable energy projects underway to meet their energy demands.

Implementation

Sydney Water has built a diverse renewable energy portfolio made up of cogeneration, hydroelectricity and solar, which now accounts for approximately 20 per cent of its total energy demand. Of this, cogeneration accounts for approximately 15 per cent of energy production, having been rolled out in eight of the larger wastewater treatment plant sites. Sydney Water are now trialling co-digestion of sewage sludge and organic food wastes; reflecting a gradually changing mindset that Sydney Water could provide broader benefits as a 'waste services' provider by expanding its current capability treating one significant stream of waste. Hydroelectricity and a small amount of solar is also generated in suitable sites within the network.

Melbourne Water also has a significant renewable energy program. Nine mini-hydros across Melbourne's water supply system generate 61,000 Megawatt hours of electricity each year – enough to power 9,000 households. In all, the water supply network generates more electricity than it uses. On the wastewater side, Melbourne Water captures biogas from the waste treatment processes at both treatment plants, and uses it to power 40 per cent of the electricity required for treatment processes. The Western Treatment Plant is on track to become energy self-sufficient (utilising its own biogas) in 2016/17. As part of its continued commitment to reduce

emissions, Melbourne Water also has a pipeline of R&D and commercialisation. These projects include algae for treatment and biofuel production, advanced biogas recovery and small scale hydro and solar generation.

Yarra Valley Water, has constructed a waste to energy facility linked to a sewage treatment plant and generating enough biogas to run both sites with surplus energy exported to the electricity grid. The purpose built facility provides an environmentally friendly disposal solution for commercial organic waste. The facility will divert 33,000 tonnes of commercial food waste from landfill each year. The waste is delivered by trucks from commercial waste producers, such as markets and food manufacturing. As well as helping to keep organics out of landfill it is also helping to make recycling commercial organic waste easier and more affordable for businesses.

SA Water's Bolivar wastewater treatment plant is 87 per cent energy self-sufficient following new infrastructure at the plant to make the best use of biogas to produce renewable energy. The renewable electricity generated at the Plant is enough to power 4000 houses a year. SA Water is also taking large strides in energy efficiency across its other sites. Since 2013-14, its innovative energy management program has helped reduce carbon emissions by 13,000 tonnes per year across wastewater treatment sites.

Queensland Urban Utilities operates three cogeneration units at its biggest sewage treatment plants at Oxley Creek and Luggage Point. The state-of-the-art technology produces up to 50 per cent of the plants' electricity needs, delivering savings of up to \$2.5 million a year. They have also unveiled Australia's first poo-powered car. The car runs on electricity generated from sewage at the Oxley Creek Sewage Treatment Plant in Brisbane's west.

Water Corporation are offsetting the electricity needs of their Southern Seawater Desalination Plant by purchasing all outputs from the Mumbida Wind Farm and Greenough River Solar Farm. Greenough River Solar Farm produces 10 megawatts of renewable energy on 80 hectares of land. The Mumbida wind farm comprise 22 turbines generating 55 megawatts of renewable energy. In 2015-16, planning started for a project to provide a significant reduction in operating costs and greenhouse gas emissions by offsetting most of the power consumed by the Beenyp Wastewater Treatment Plant. Delivery of this project is expected to be complete in 2018.

Many other utilities across the country are also making a contribution. These contributions range from small to large scale. They include small-scale solar to shared large-scale solar farms, wind towers to supply all of a utility's needs and off-grid solutions.

Benefit / outcome

- Financial benefits – reduced energy costs and hedge against future price increases and insecurity of supply.
- Reduction in greenhouse gas emissions/climate change mitigation.
- Contribution to liveable and resilient cities.
- Reputational benefits for utilities.

Further References

For more information please go to the websites for:

– Sydney Water (sydneywater.com.au/SW/water-the-environment/what-we-re-doing/energy-management/index.htm);

– Melbourne Water (melbournewater.com.au/whatwedo/Liveability-and-environment/energy/Pages/Energy-efficiencies-and-renewable-sources.aspx).