



Case study 9

Renewable energy

Melbourne Water, Sydney Water

This case study showcases:

water businesses delivering more than just water and sewerage provision

Problem

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 the nature of sewage treatment processes employed, and varies significantly from city to city and process to process. In a carbon constrained future, relying on non-renewable sources of energy will mean utilities and communities will face a number of challenges:

climate change impacts on society if greenhouse gas emissions are not curbed

shocks to energy price and supply variability

rising costs as more energy intensive options, such as recycled water, decentralised systems and desalination are considered.

understanding customer willingness to pay for less greenhouse intensive options

resolving environmental trade-off energy intensive nitrogen removal versus discharging it to the environment.

Solution

Many utilities are looking for renewable energy sources to meet their energy demands.

Sydney Water has built a diverse renewable energy portfolio made up of cogeneration, hydroelectricity and solar, which now accounts for approximately 20% of total

energy demand of the utility. Of this, cogeneration accounts for approximately 15% 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. Notably, there has been some community interest in using Sydney Water land for community solar sites. Sydney Water has been approached by community based renewable energy groups or companies to discuss the potential to place solar PV systems on Sydney Water assets. The companies would fund the generation system and pay Sydney Water a royalty for access to the space. Sydney Water would also access sufficient 'behind the meter' electricity to power on-site assets, with the bulk of the power being exported to the grid. Reservoirs are the sites of main interest as these are large open spaces, but involve the challenge of finding suitable floating solar PV arrays.

Melbourne Water also have 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% 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 its 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.

Business case

Getting renewable energy projects approved is generally based on what makes good commercial sense – i.e. those projects where there is financial pay back over the life of the project, the ability to leverage and make 'quick wins' off the system (e.g. biogas from large wastewater treatment plants) and/or to reduce high supply costs or unreliability in supply (e.g. in some remote areas).

Under the currently electricity market there tends to be little incentive to feed electricity back into the grid and renewables need to offset a current energy use. This can limit feasibility of these projects down to a few suitable sites. More lucrative tariff structures such as a local network tariffs are being investigated as a means of facilitating renewable energy exports into the grid. Melbourne Water have negotiated offsetting of renewable energy generation between sites as part of their long term energy contract.

Customer research undertaken by Sydney Water has found that customers highly value utility efforts to pursue renewable energy projects; despite this there is

little willingness to pay over and above current bills. However due to this customer support and the broader environmental benefits, business cases can be approved on longer payback terms than a normal project. As part of Melbourne Water's recent pricing submission to the regulator, willingness to pay was undertaken to get an understanding of community support for renewables. This work showed that the community is willing to pay for a portion of Melbourne Water's energy to be sourced from renewables at a small premium.

Key drivers

Renewable energy is generally used to deliver projects and services at the lowest

cost to customers and the lowest impact to the environment.

Newer technologies or approaches are also facilitating the uptake of renewable energy solutions where they were not feasible previously.

Support for renewable energy varies from state to state. Strong policies, mandatory/voluntary targets or financing mechanisms can drive a push towards renewable energy solutions however to date the policy landscape across most states has been largely uncertain. Melbourne Water support the Treasurer of Victoria's new \$300 million green bonds initiative, which drives investment into projects that offer climate change and environmental benefits. Melbourne Water

projects that can be supported through the green bonds initiative include the construction of 9 additional mini hydros and improvements on the biogas capture and reuse at the Western Treatment Plant and Eastern Treatment Plant.

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