



Unlocking the value of food waste

Co-digestion in the Western Parkland City

Sydney
WATER

Acknowledgement of Country

Sydney Water, NSW Circular and the Institute for Sustainable Futures UTS acknowledge the Traditional Custodians of the lands and waters that include the Western Parkland City. Their lore, traditions and customs nurtured and continue to nurture the waters within Sydney Water’s operating area, ensuring wellbeing for all. We pay our respects to Elders, past and present, and acknowledge their continuing connection to land, water and community.

The opportunity for co-digestion in the Western Parkland City

The Western Parkland City is the largest growth area in NSW, covering eight local government areas including the Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith and Wollondilly. With direct access to the new Western Sydney International (Nancy-Bird Walton) Airport and surrounding Western Sydney Aerotropolis, it’s destined to become an economic powerhouse.

More than \$20 billion of investment is already planned for the city, with globally competitive industries forecast to create 200,000 new jobs over the next 20 years. It’s also estimated there will be 1.5 million more people living west of Parramatta and more than 184,500 new homes by 2036.

Successful cities of tomorrow will need to be leaders in decarbonisation and sustainability. As the Western Parkland City grows, so will the task of responsibly managing its environmental footprint. In particular, the collection and management of food waste and fats, oil and greases created by businesses and households will require a bold new approach.

Leading with the Advanced Water Recycling Centre

Sydney Water is building the Upper South Creek Advanced Water Recycling Centre (AWRC) at Kemps Creek to help manage the predicted growth of the Western Parkland City. Located in the heart of the Western Parkland City, it presents an exciting opportunity to manage organic waste in a way that captures, recycles and reuses energy and nutrients in line with the latest technology and circular economy principles.

Economic modelling completed by the Institute for Sustainable Futures UTS for Sydney Water and NSW Circular examined the direct and indirect economic benefits that could be unlocked by co-digesting wastewater and organic waste from the Western Parkland City at the AWRC. The study considered the economic impacts of organic waste collection, processing (construction and operation), and outputs (renewable gas, electricity, and biosolids).

The study assessed five co-digestion scenarios that are readily achievable using existing technology and operating models. The scenarios looked at co-digesting wastewater with:



Food waste from residential multi-unit dwellings



Commercial food waste



Fats, oils and greases (FOG)



Combined food waste and FOG



No additions (the reference case, whereby organic waste continues to go to landfill)

Citation

Jazbec, M., Liu, A., Rutovitz, J., Nghiem, L.D. and Turner, A., *Unlocking the value of food waste: a case study of co-digestion in the Western Parkland City*. Summary. Report prepared by the Institute for Sustainable Futures, University of Technology Sydney, for NSW Circular & Sydney Water.

Australia's organic waste problem

More than 80 per cent of Australia's food waste is currently disposed of in landfill, where it decomposes to form methane, a potent greenhouse gas. This is despite strategies at all government levels aimed at diverting organic waste from landfills and creating a pathway to zero greenhouse gas emissions.

Co-digestion is widely considered to be a more environmentally friendly method of treating organic waste streams. It's been identified by the *NSW Waste and Sustainable Materials Strategy 2041* as one of the technologies needed to achieve NSW's emission reduction and waste management aims.

The cost of collecting organic waste

From 2026 to 2036, the Institute for Sustainable Futures estimates that approximately 1.5 million tonnes of residential food waste will be generated in the Western Parkland City. An additional 700,000 tonnes of commercial food waste will also be generated, including large quantities at the new Western Sydney International (Nancy-Bird Walton) Airport.

To take advantage of co-digestion of food waste, a new source-separated food waste collection service is needed.

However, due to the small amount of food waste created per household each week (about 4.8 kg), a combined food and garden organics service is generally suggested for single dwellings.

By contrast, multi-unit dwellings are grouped together, making collection more economic. Introduction of a new separate food waste collection service for multi-unit dwellings in the Western Parkland City would cost \$1.4 million and create 45 new jobs.

Catalysing a new approach for organic waste

Sydney Water's AWRC presents a unique opportunity to activate a broader circular economy hub for the management of water, energy, bioresources, skills and jobs in the Western Parkland City.

The AWRC will treat wastewater from homes and businesses, producing recycled water for a range of residential, agricultural and industrial uses. It will also be used to process other organic wastes – such as food waste or fats, oils and greases – to create biogas and biosolids.

Biogas can be used to generate renewable electricity, as a fuel for vehicles or as a replacement for natural gas. Biosolids contain valuable nutrients including nitrogen, phosphorous and potassium, and other valuable trace elements, such as copper and zinc.

Sydney Water's AWRC presents a unique opportunity to activate a broader circular economy hub for the management of water, energy, bioresources, skills and jobs in the Western Parkland City.

Circular makes cents – the benefits of co-digestion

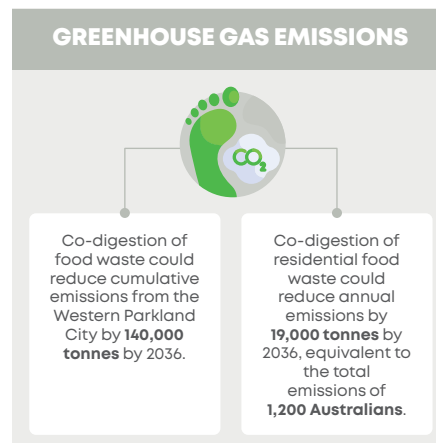
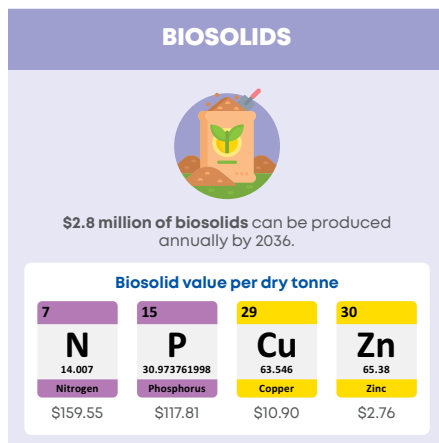
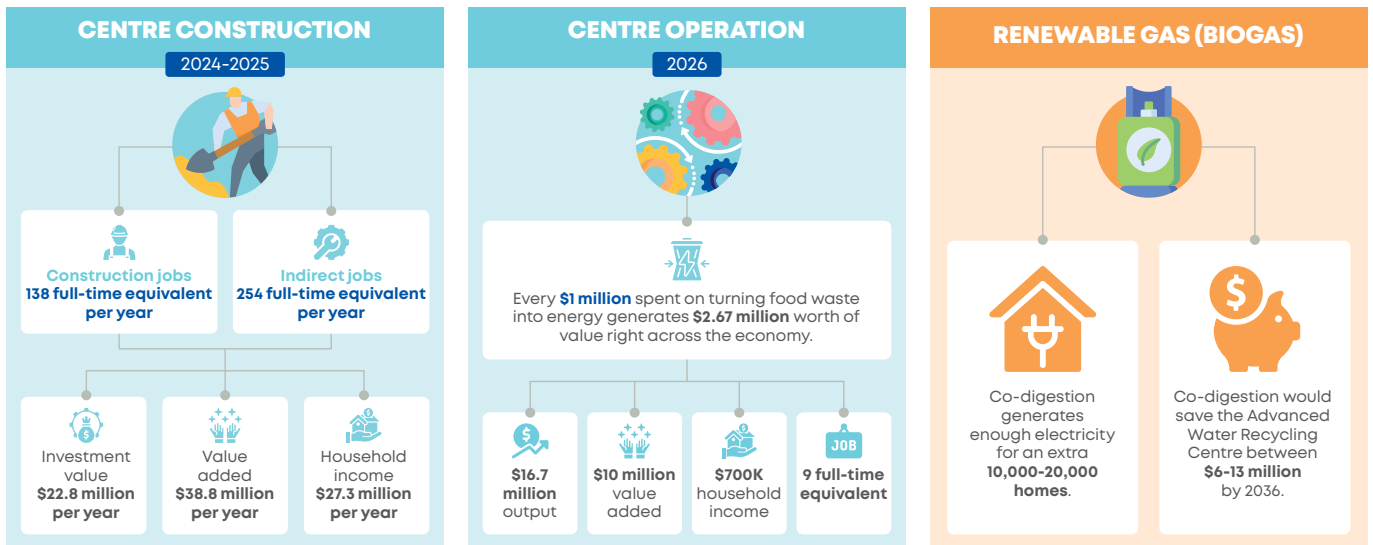
The Institute for Sustainable Futures' modelling found that the AWRC could divert up to 30,000 tonnes of organic waste from landfill per year by 2030, with the biogas used to generate electricity, and benefits for jobs, emissions, and the wider economy.

Expanding the co-digestion program to the whole of the Western Parkland City (Riverstone, St Mary's and Liverpool wastewater treatment plants) could divert up to 165,000 tonnes of organic waste from landfill per year by 2036. This would generate enough electricity to power an extra 120,000 homes and reduce annual emissions by 70,000 tonnes. Altogether, the program would create up to 300 ongoing direct jobs and, by 2036, save \$40 million through electricity generation and \$14.4 million from biosolids each year.

Organic Resource (processable waste streams)



Benefits



For a full copy of the economic modelling report, further information or to discuss partnership and investment opportunities, please email StakeholderEngagement@sydneywater.com.au