Future-focused

A DynaGrate at the Amager WtE plant.

CLEAN ENERGY PROVIDER BABCOCK & WILCOX IS MOVING THE GOAL POSTS AND UNLOCKING NEW WAYS TO RECYCLE RESOURCES.

The next 10 years offer the opportunity for tremendous growth in renewable energy and waste-to-energy (WtE) as Australia strives to reduce material sent to landfill and meet net zero emissions targets, says Babcock & Wilcox's (B&W) Toby Terlet.

Toby, who is B&W's Director of Business Development in Australia, says the country is in a prime position to take advantage of emerging technology that pairs waste-to-energy with carbon capture and other renewable markets.

"Waste-to-energy is the best available technology to deal with household waste but we're moving into other technology outside of large-scale WtE," says Toby. "The climate is right for decarbonisation solutions and hydrogen facilities. That's where we need to talk about WtE within Australia. Looking beyond the waste combustion side for heat and power and looking at a growing market for waste-derived fuels that can all be used to power homes, vehicles and industrial applications.

"That's going to be the next level within Australia – waste-to-energy facilities with other technologies that can bolt on to the other end to capture carbon or be used to produce hydrogen, or both."

US-based B&W has developed an energy production technology that simultaneously supports low carbon initiatives and energy transition. Known as BrightLoop, this chemical looping process can use a variety of feedstocks, such as municipal waste, biomass, biogas, natural gas, refinery byproducts and methane to convert into multiple products, including hydrogen.

In October 2021, the company signed an agreement to jointly develop a biomass-to-hydrogen project in Port Anthony, Victoria, using BrightLoop technology. It is expected to be the largest green hydrogen hub in south-eastern Australia.

B&W has built waste-to-energy facilities around the world, including many in the UK, Europe and the US, such as the Amager Bakke/Copenhill plant in Copenhagen, Denmark, widely regarded as "the cleanest waste-to-energy power plant in the world," and


The Amager Bakke/Copenhill plant in Copenhagen.

two world-class, low-emissions WtE facilities in the affluent community of West Palm Beach, Florida, in the US.

Toby says that B&W is in discussions with multiple waste-to-energy plant owners to introduce carbon capture and other renewable technologies for their plants, although he did not disclose which plant operators or locations are part of those discussions.

"It's an exciting time," Toby says. "We've got the technology not only to deal with waste now but to touch on some of the newer, renewable technology and we're keen to really drive that. Our mantra is to really push the current market and the way of looking at things. We're not just happy sitting in the today space, we're willing to innovate and look at newer tech and better ways of doing things."

B&W has more than 150 years' experience in designing, supply and servicing technology for waste-to-energy plants throughout Europe, Asia and North America.

Toby says there is a distinctly different landscape in terms of acceptance of WtE in Europe compared with Australia, but we're catching up and have an opportunity to lead.

He says much of the hesitancy in the past has been due to a lack of understanding about waste-to-energy and fears that the technology will halt recycling. However, he says modern WtE facilities are complementary to recycling and use what remains as fuel after recyclables, including metals, are removed from the waste stream.

"A lot of people have never seen a waste-to-energy facility and don't know what it's all about. Then, a lot of people have a view of what an incinerator smells like and what it looks like. They have that embedded issue of WtE being dirty and none of the emissions being captured, but modern waste-to-energy facilities are very different and can be equipped with state-of-the-art emissions control systems. It's a highly technical, very clean process that is fit for purpose for Australia."

He says waste-to-energy is the pathway forward to deal with household waste as Australia moves away from its reliance on landfill and he believes it will become more attractive in regional areas for local government authorities and the surrounding communities.

Smaller, regional plants can reduce waste transportation costs, increase job opportunity and recover more material from the waste streams. Added technology can be diverted back to the community to run local buses or fleet cars with hydrogen, and thousands of tonnes of methane that would otherwise be generated by organic waste decomposing in landfills can be eliminated. Methane is a potent greenhouse gas with roughly 84 times the Global Warming Potential (GWP) of carbon dioxide on a 20-year basis. By combining waste-to-energy with carbon capture, WtE plants can be net-negative in regard to greenhouse gas emissions.

"If you put waste through a WtE facility it's gone that day," Toby says. "You can pull out all the recyclables possible and you don't have legacy issues to deal with for years. You don't have to rehabilitate land or worry about leachate in ground water.

"It's not going to replace all technologies and it's not going to see other recycling disappear. It's going to replace some landfill – not all of it – but it's a better option. If we can reduce landfill by 90 per cent, the environment is in a lot better position."

He encourages government to see the benefits of waste-to-energy as an important solution to address climate change and recognise that the technology complements recycling and creates jobs.

Long-term, he hopes Australia has a balance of WtE facilities to deal with a majority of unrecyclable waste streams but also looks at how much waste is generated.

"We're the end of the line but waste-to-energy is just one piece of the puzzle," he says. ■

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