Waste-to-fuel pellet plant targets 2028 launch

Felicity Wolfe, Energy News
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A Lyttelton-based waste management entrepreneur is planning to build waste-to-fuel plants in Canterbury to produce high calorific pellets, with a pilot plant running in March and a full-scale facility in production by 2028.

Process Engineered Fuel Company founder and managing director Carl Storm - who also started NZX-listed WasteCo - says the Christchurch pilot will process about a tonne of waste per hour, with 85 per cent being diverted from landfill.

He has also signed a lease for a site next to Timaru District Council's Redruth Resource Recovery Park, where a full-scale facility will be able to handle 23 tonnes of waste an hour - about 460 tonnes per day.

Storm aims to have that site in production in 2028.

The United States-developed technology being used by Pefco will produce pellets that provide just over 20 gigajoules of energy per tonne, compared to about 23 GJ for coal and between 14 GJ and 17 GJ for wood chip.

Production

"So we're in between the coal energy and that of the wood chip energy," he says.

The firm needs to get production running quickly, having already signed a contract to supply a customer who will then on-sell the biofuel pellets.

Storm expects four containers of components for the Timaru site will ship from the US this week, with remaining equipment due to be on its way by Christmas.

The waste-to-fuel process is an important tool in dealing with several issues nationally, he says. One is that industries are facing costs from both carbon liabilities, which are currently about $100 from burning a tonne of coal, and landfill waste levies of $75 per tonne.

"One really important thing is that if someone has a coal boiler, they don't need to go and spend $5 million changing it to a biomass boiler. We can use the existing boiler and just change the settings, set it up, and forget it," Storm tells Energy News.

Another issue is that landfills around the country are reaching capacity, and smaller councils in particular do not want to go through the consenting process again.

"If you want to know what my why is, it is diverting as much as possible from landfill," Storm says.

"We believe there's only two types of landfills: the ones that are leaching and the ones that are going to leach in the future."

Waste entrepreneur

Storm loves the waste industry, having started his first collection firm at age 16. He was still in school, running his rubbish truck at lunchtimes because some of his business customers would be closed by 3pm.

"But as the business grew, it got later and later before I got back," he says.

Eventually the principal said that while Storm had great entrepreneurship, he was setting a very poor example for everyone else.

"And so I left without my School Certificate," he says.

Instead, he employed more people and grew his business, until he sold it to Waste Management in 1993.

Having worked for himself for eight years, he decided that he "knew enough to know I didn't know enough" and went to work for corporates for a while to "get some discipline in place" and understand profit-and-loss statements and balance sheets.

Initially, he worked in Fulton Hogan's waste division (now called Enviro NZ), then spent another five years working for family-owned Auckland company Metro Waste.

He then went to Veolia, "the largest waste and recycling company in the world" before going back into business, starting WasteCo in 2013.

He ran that business for nine years, during which time it was in the Deloitte Fast 50 list for three years.

A key development was building a facility to sort waste. The firm also developed a medical and quarantine waste processing facility, taking in waste from hospitals and quarantine waste from ships and planes, including vessels arriving in Lyttelton.

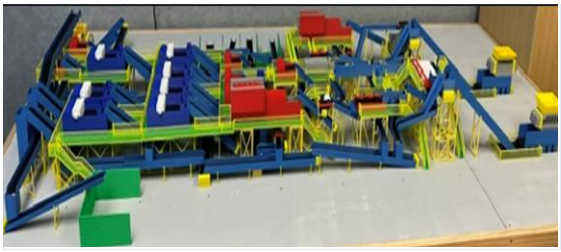
"That was sensational", he says.

WasteCo was listed on the NZX in 2022, when Storm stepped back and retired from it, remaining a 10 per cent shareholder.

Not burning rubbish

Storm says that the process being used by Pefco is very different from other waste-to-energy developments - such as the Project Kea scheme in Waimate - as it is not "just burning rubbish" to generate electricity.

He has hired that project's former chief executive, Vin Smith, as Pefco's chief operating officer to handle regulatory and consenting work with the Canterbury Regional Council and Timaru District Council. Based on discussions so far, he doubts there will be consenting challenges.



Model of the waste-to-fuel processing equipment in the planned Redruth Pefco complex.

Storm says Pefco is also looking to get research done on the potential carbon liability of the pellets, and notes that Pefco gained $1 million in funding from former Government energy transition agency Ara Ake for its pilot plant.

The agency, which was disestablished following this year's Government Budget, had grants between $100,000 and $1 million for emerging energy technologies. After looking at the project, it approved it for the full amount, Storm says.

"That was really important to us because, from a credibility perspective," he says.

Storm says it is a shame that the organisation was closed, as the process was very good and its staff were "great people to work with".

Currently, the firm is in the process of raising $60 million for its full-scale facility: "We're surprisingly a long way down the track with that."

While there is a small gap to fill, Storm says that is due to the firm ensuring the right partners are involved.

Tennessee discovery

Storm discovered the technology after travelling overseas with his wife Dawn to look for emerging waste-to-fuel technologies.

They found Tennessee firm WasteAway, which has developed a process to turn non-recyclable waste into high-density engineered cellulate fuel pellets which are a "direct, low-carbon substitute for coal and other fossil fuels".

That firm is currently building its first commercial plant, but Storm says its pilot plant has been successfully operating for 20 years, with the pellets' suitability in coal burners proven in trials.

Having visited and operated the equipment and experienced operations at WasteAway's Tennessee plant, Storm says he is a "convert".

"I've seen rubbish go in one end, and I've seen the cellulose come out the other edge to be pelletised."



The cellulose fibre and final pelletised product

Storm stresses the importance of producing consistent end products. Having been pre-sold, Pefco's pellets will be tested weekly for their energy availability and audited both in-house and by the Bioenergy Association.

"The gigajoule testing is extremely important for us. That's how we get paid. We get paid by the gigajoule, not by the truck."

The material for the process will be carefully selected from general waste to ensure it is suitable to make great pellets.

That feedstock is put in a hydrolyser and steam sterilised at 185 degrees to kill pathogens - which Storm says is very similar to the medical and quarantine system previously implemented by WasteCo.

"And then there's some magic that happens when it exits the steam steriliser, which turns it into cellulose."

That cellulose is then dried and pelletised in a process Storm is looking to patent.

He says the result is not only pellets; it is mass diversion away from landfill, with an income stream from the fees from taking waste as well as the pellet sales.

Recycling

The process begins, however, with an automated line to separate recoverable metals, plastics and other inert materials for recycling.

Storm has already purchased the plant from his former WasteCo business, with the sorter using air sifters, near-infrared scanners, X-ray equipment, eddy-current separators to remove aluminium and steel-pin magnets to remove steel.

Those recyclable materials will be baled by his Balers NZ venture, part of the wider Pacific Waste Holdings group.

Storm expects about 15 per cent of that initial waste stream, such as plastics with high chlorine levels or materials with heavy metals, will still go to landfill. But the remaining 85 per cent will either be recycled or used in the pellet process.

In addition to its recyclables baling operations, Pacific also includes engineering firm BJ Scarlett which will build the Timaru production site and offer "turnkey" facilities to others in the future.

Next, Storm plans to build another in the North Island, and he has longer-term ambitions to offer turnkey plants overseas, including in Australia.

Storm expects Pefco will have to fight to gain a share of the waste stream from incumbent operators, establishing "The Dump" transfer station in Sockburn as a disruptor to current landfills.

He also set up the GoWaste collection business in Christchurch and now Dunedin.

Storm hopes to open another transfer station in Dunedin, and is also considering Greymouth, where he has the Westland Waste business as another possible location.

He believes there is plenty of rubbish available for his plants.

"There's 880,000 tonnes in the South Island. We only require 165,000 tonnes of that," he says.

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