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Plastics into oil at APR Plastics

LISA KORYCKI
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The WASTX P1000 uses pyrolysis to break down products.

APR Plastics is introducing an Australian-first to help solve the nation's plastic recycling problem.

As Australia prepares for the second phase of the waste plastic export ban in July 2022, a Victorian company is powering up for a new generation of recycling.

APR Plastics has installed an advanced recycling unit that will convert hard to recycle soft plastics destined for landfill, such as chocolate wrappers and bread packaging, into oil for plastic remanufacture.

The WASTX P1000 uses pyrolysis, the process of applying high temperatures under zero oxygen conditions, to break down products. Manufactured by the Biofabrik group in Germany, it is the first of its kind in Australia and will process up to 1000 kilograms of plastic per day. One kilogram of plastic waste becomes 850 millilitres of recycled oil.

Three types of plastic – Low-Density Polyethylene (LDPE), High-Density Polyethylene (HDPE), and Polypropylene (PP) – can be processed.

Darren Thorpe, Managing Director APR Plastics, says the ability to process plastics to oil will go a long way to help solve Australia's plastic pollution problem and build a circular economy.

"About 3.5 million tonnes of plastic is made in this country every year, that's how much we have available to be able to recycle," Darren says.

"We're not going to get all of that, but this is a very good solution to help us reach national recycling targets. It's a drop in the ocean but it starts the ball rolling."

Global plastics production has soared in the past 60 years and is expected to double across the world by 2040, according to the Ellen McArthur Foundation.

The Australian Government has placed waste firmly on the agenda and from 1 July 2022, phase 2 of the waste plastics export ban comes into place. The ban means plastics will need to be sorted into single polymer type and further processed into flakes or pellets before they can be exported.

The National Plastics Plan also sets a target of 70 per cent of plastic packaging to go on to be recycled or composted by 2025 and to have at least 50 per cent of recycled content within packaging. Only 13 per cent of plastic used in Australia is recycled and 84 per cent ends up in landfill, according to the *National Waste Report 2020*.

Darren says that after glass, soft plastics is the biggest contaminant of kerbside, yellow-topped bins in Victoria.

"We were seeing that the biggest waste component coming out of our Materials Recovery Facility (MRF) was soft plastic," he says. "We knew we had to find a solution."



The first machine installed at APR Plastics will be used to test the process.

Logan Thorpe, Special Projects Manager APR Plastics, says the pyrolysis method provides a circular solution for plastic waste. Because it is a completely sealed system, it also has little to no emissions compared to traditional disposal methods such as incineration.

Oil created will be sent to a refinery to be further processed so it can be reused in food-grade plastic products.

"It's plastic-to-plastic," Logan says. "We're going from a resource as feedstock, to a product, and back to a resource. It has circularity."

It's been an almost two-year project to bring the soft plastics to oil process to Australia. APR Plastics' first machine was to be installed in October 2021 but "COVID-19 slowed everything down", Darren says.

A one tonne WASTX P1000 was installed at the company's Dandenong South facility in March 2022. With funding assistance from Sustainability Victoria, a five-tonne machine capable of processing 1800-tonne a year is on its way.

The company has applied for funding through the Federal Government's Recycling Modernisation Fund to purchase a 50-tonne machine to increase recycling capacity and is hopeful the machine will be in Australia by June 2023.

"Lilly D'Ambrosio [Victorian Minister for Energy, Environment and Climate Change] is incentivising innovation in businesses to promote a circular economy. This is a perfect example," Logan says.

"We're taking plastic that is destined for landfill from MRF and turning it into oil which can then be refined and turned back into food-grade packaging. It's an innovative project that will divert tonnes away from landfill."



APR Plastics hopes to bring a 50-tonne machine to Australia to increase recycling capacity.

The first machine is a "prototype" to test the process and the oil production.

"We want to make sure we can give the end user a quality material with minimal contaminants," Darren says.

"For every hour we put 40 kilograms of plastic in, theoretically we should be getting 30 litres of oil out, but there's a lot of information we don't know about the types of plastics and contaminants.

"There's a lot of testing to be done before we start production. We've got to crawl, walk, and then run."

Logan is in discussions with Viva Energy, which owns the Geelong Oil Refinery, to process and refine the oil produced from the soft plastics. Viva also has made an international commitment to use 1 million tonnes each year of pyrolysis oil in its own processes.

Logan is keen to see the oil produced by APR Plastics stay in Australia.

"We have companies overseas through connections with Biofabrik who will take the oil, but we want to keep it in Australia," he says. "We want to be part of Remade in Australia."

Australian Paper Recovery has five facilities in Victoria, including a Materials Recovery Facility at Truganina, a Commercial and Industrial processing site at Dandenong and a secure destruction and shredding facility at Fairfield.

The Truganina facility is the only one in the state, and possibly the country, that **doesn't accept glass** because of the risk of contaminants to the end markets.

Darren says despite Australia's focus during the past few years to take responsibility for its waste, he has not seen a reduction in the number of soft plastics coming through kerbside collections and going to landfill. He estimates that a minimum of 40 per cent of the waste collected is soft plastics and food packaging materials.

At the moment they are sorted by hand at the MRF, but Darren is hoping to trial an opt-in system in which residents will be provided with a bag specifically for recycling soft plastics. The bag will be QR-coded to give feedback about the quality of materials. There are also plans to open a new MRF to triple kerbside recycling capacity and capture more soft plastics.

Logan says the plastics-to-oil process is not an alternative to mechanical recycling but is complementary. He says the process has been successfully used overseas for some time. In Europe, which is about 10 years ahead of Australia, up to 30 per cent of recyclable products are recovered.

"We've got big aspirations," Darren says. "We've done enough homework to see this is the way of the future."

"There's a lot of seasoned industry people getting excited about this. There are a lot of other companies looking at it in different shapes and forms, but we're the forerunner."

"There's 3.5 million tonnes of plastic per year available – there's so much opportunity for everybody."

For more information, visit: www.aprplastics.com.au

#Australian Paper Recovery #export ban #landfill diversion #pyrolysis #soft plastic recycling

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