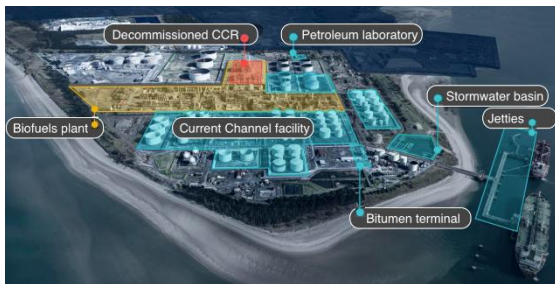


Redevelopment of the Marsden Point energy precinct



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[click on image to enlarge]
Marsden Point is no longer recognisable as an oil refinery. Source: Channel

Analysis: When Christopher Luxon and Narendra Modi met in Auckland on Saturday, they agreed NZ would “engage with” the India-led Global Biofuels Alliance to support sustainable energy transitions.

It’s not entirely clear what “engage with” means to Luxon, in his sometimes impenetrable corporate-speak, but to Modi it was clear: he said he welcomed NZ joining the alliance.

India produces a massive amount of biofuel – it ranks as the third-largest biofuel producer in the world, and the fourth-largest biofuel consumer. But biofuels remain a messy business ...

As of April this year, India’s service stations are required to sell a mix of fuel that contains at least 20% bioethanol, and that’s driven a big increase in the production of the dubious biofuel from sugarcane and agricultural waste.

Here in NZ, a sharemarket announcement this morning highlights similar difficulties. Channel Infrastructure has told investors it will clear away a big, decommissioned piece of Marsden

Point oil refining equipment to make more space for its planned bio-refinery.

(For the record, it’s the old refinery’s continuous catalyst regeneration platforming unit, which it’s selling to Pakistan’s Integrate Scope DMCC for nearly \$6m, now that the Indian PM is safely out of the country).

Channel’s also announced a partnership between the Marsden Point bio-refining consortium and fertiliser giant Ballance Agri-Nutrients, to manufacture fertilisers from byproducts of the bio-refining process.

As this bio-refinery plan get bigger and bigger, and it partners with more and more firms across transport, manufacturing and engineering, there’s one outstanding question Channel still has to answer

What is the feedstock from which it will make its biofuels?

Because three years ago, as the company picked up speed on its plans for a big biorefinery, it quietly warned (p38 in a 77-page analysts’ day report) of the challenges of using organic feedstocks – fats, oils, forestry waste, and municipal solid waste.

The key challenge to scalability, the Oct 2023 report noted, is the sheer quantity of feedstock required. Bear in mind, Channel’s grand plan is to make up to 400 million litres a year of low carbon renewable fuels. (And even that bold production strategy would supply only a tiny fraction of the 3.5 billion litres of petroleum NZ uses).

Perhaps the oldest technology used in NZ was by Fonterra, which had an Anchor factory in Tirau, in the Waikato, that made fuel-grade

ethanol from dairy whey for more than 20 years. Among other uses, it sold the ethanol to Gull to mix into their transport fuels. But this was too expensive, and too dangerous. In 2023, Fonterra converted the plant to high-value lactose production.

Civil construction firm Fulton Hogan bought a Christchurch plant that used old cooking oil to manufacture biodiesel, for use in its heavy machinery. But as the company's sustainability engineer Dave Aston told me back in 2021: "The trouble is, we need people to eat more fish and chips!"

Councils including Auckland, Rotorua Lakes and Manawatū send food waste from kerbside collections to Ecogas, an anaerobic digestion facility in Reporoa.

Yet as Channel's 2023 report rightly noted, the quantities of all these food waste products are simply too low to scale up production

What NZ has in far greater quantities is tallow, from meat processing. That was the inspiration for Z Energy to commission a biodiesel plant in Wiri in South Auckland – but by the time the plant opened in 2016, the rest of the world had cottoned on to the value of tallow in biofuels.

The price went through the roof and this country's meatworks entered multi-year contracts to supply California and Singaporean plants instead. NZ now exports 120,000 tonnes of tallow a year – and Z has sold its Wiri plant.

The most worrying impact of biofuels production is when land that could be farmed to feed populations is instead turned over to fuel crops. This is not about using food waste; this is about growing crops purely for fuel. That's happened with disastrous impact in the US with corn, and in Brazil and India with sugarcane.

"Feedstock cultivation competes with food crops," the Channel report said. "Risk of feedstock cost escalation as SAF scales and demand grows."

Brian Cox from the Bioenergy Association warns Channel and its consortium partners against making that mistake. He's already seeing some Kiwi farmers turning over their land to cereals for fuels, between growing other crops, and says it will happen more and more. "We do not promote energy crops like what you're talking about," he says. "We promote residues from existing agriculture."

In 2021, former Refining NZ chief executive Naomi James told me she wanted to convert Marsden Point's technology into a plant to produce biofuel from forestry waste – and since then, that's been assumed to be the obvious feedstock. After all, Northland has more forestry than almost any other part of the country

There are still some who hope to harness forestry waste to make biofuels. Kiwi-founded LanzaTech previously partnered with Air NZ and the Govt to study its potential for sourcing woody biomass from the Northland and Kawerau mills in order to manufacture sustainable aviation fuel at Marsden Point.

But there was a hint in the 2023 report that Channel, as the company had been renamed, was going cool on the idea. "Forestry wastes are dispersed, with a high cost to harvest, aggregate and transport," it observed.

Now there are signs the Marsden Point consortium, led by Chicago-based Seadra Energy Inc, is looking for a fresh solution. Channel has told investors it's documented key terms for feedstock supply and product off-take in a heads of agreement, and these terms are progressing to final form.

With all the other solutions pretty much ruled out, I would suggest the one that remains is using livestock effluent. Yes, cue the jokes.

The belching and farting of our cows and sheep contributes to NZ's greenhouse gas emissions – but perhaps their faeces could now help solve the problem. Firms overseas have already patented processes to convert excrement from lactating dairy cattle to a combination of ethanol, methane and fertiliser.

The Sustainable Aviation Fuels Asia-Pacific Summit was held in Melbourne last week; NZ Associate Energy Minister Shane Jones was a keynote speaker. The roundtable leading the work in NZ, which had been in hiatus as the fuel sector dealt with the Strait of Hormuz crisis, has now kicked back into action

There's a certainty in the industry that solutions are needed, ever more urgently. Aviation, and to a lesser extent shipping, remain enormously difficult to decarbonise – they need a transitional and sustainable 'drop-in' biofuel, until it's possible to build long-haul hydrogen or battery-electric jets.

Yet progress remains slow.

Here's a thing: Anchor Ethanol Ltd first purchased its European-patented whey-to-ethanol processing technology in the late 1970s. Yet half a century later, we still haven't found a way to produce biofuels in New Zealand, from sustainable feedstocks, at scale. And so, we still haven't weaned ourselves off petroleum.

Time is running out.

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