

Explore NZ – Biodiesel “just made perfect sense”

As a leader of expeditions to wildlife and scenic attractions, this award-winning tourism business has a strong environmental focus. A move to biodiesel has brought its operation in closer alignment with that focus, and fulfilled its aim to lead the industry in a more environmentally-friendly direction, by encouraging other operators to make the switch to biodiesel.

About Explore NZ

In the 10 years since its inception, Explore NZ has grown from a small corporate charter yacht business set up to capitalise on the 1999/2000 America's Cup, to a multi-faceted tourism venture with bases in Auckland and Paihia. It offers a range of expeditions, from scenic pleasure cruises and expeditions to swim with dolphins, to hands-on yacht sailing and off-road vehicle adventures. As such, its fleet comprises a wide range of vessels and vehicles: four America's Cup yachts, four 50-foot monohull yachts, a 72-foot sailing catamaran, four cruise catamarans (seating 500 passengers in total), and two passenger coaches.



A logical choice for eco-tourism

Explore NZ has a sustainability and environmental ethos, in keeping with a business showcasing New Zealand's marine and coastal environment. In recent years the company observed the growth of biodiesel as a mainstream fuel and began contemplating a move to it. The firm also wished to be an industry leader – in more than a purely business sense – and to show other businesses that moving to biofuel is viable, says managing director William Goodfellow.

Switching over to biodiesel

In 2009 Explore NZ contacted Environ Fuels to examine the practicalities of changing their fleet to biodiesel.

Its diverse fleet hails from four different engine manufacturers and, although few of the engines were within warranty, Explore NZ was nevertheless keen to have the manufacturers' perspectives before proceeding. Three of the firms (Scania, Caterpillar and Volvo) endorsed the proposal to use a 20% biodiesel blend (B20). The fourth, MTU, advised against using more than a 7% blend. Explore NZ, however, felt confident to use a 10% blend (B10) in that particular motor, based on the technical information they had, and the knowledge they would be using a high-quality biodiesel.

As one of their motors was being reconditioned around that time, Explore NZ took the opportunity to directly compare B20 with ordinary diesel, running back-to-back tests on a dynamometer. Forewarned to expect a slight drop in horsepower, they were pleasantly surprised when B20 came out on top. "Slightly more power and using slightly less fuel – the numbers were very small but it confirmed we were on the right track," says Goodfellow.

After a short, successful trial of B20 on some of their yachts, the entire Explore NZ fleet – both land and sea – switched to B20 biodiesel (except the one vessel using B10, as noted) in late 2009.

No modifications were required to use biodiesel, nor any special set up requirements other than an additional fuel filter change – standard practice when switching to biodiesel (see 'Technology Overview' overleaf).



Key features

- Yachts, catamarans, and two passenger coaches running on B20 biodiesel
- No modifications required to use biodiesel
- Working to increase biodiesel use for Bay of Islands tourism and marine industries

Key benefits

- A cleaner burning fuel that helps reduce CO₂ emissions.
- Aligns with the firm's sustainability and environmental ethos – important in the high-profile international tourism market.
- More biodegradable than ordinary diesel and breaks down in water – a consideration for marine industries, which have to pay for the clean-up of any fuel spills.
- Higher engine lubrication than ordinary diesel. The fleet is running reliably on it, with fuel and maintenance costs unchanged.

Sector relevance

- Tourism industry
- Marine industries

Technology overview

- Virtually all diesel vehicles can use a 5% biodiesel blend (B5) without any engine or fuel system modifications. Higher blends, such as B20, are able to be used for many large commercial vehicles such as trucks, buses, and vessels, provided a few simple checks and steps are followed. Some engine manufacturers also approve the use of 100% biodiesel. EECA recommends that businesses check with their vehicle or engine manufacturer, and with a specialist with particular expertise in the field, about the level of blend that's suitable for their vehicle or vessel.
- Biodiesel blends tend to 'clean' fuel systems, loosening dirt and deposits and carrying them through to the fuel filter. As a result, one or more fuel filter changes are required after switching to biodiesel, to remove the loosened engine grime.
- Biodiesel is more lubricating, cleaner burning and more biodegradable than ordinary diesel.
- All biodiesel blends for sale in New Zealand must meet fuel specifications regulated by the government.
- 100% biodiesel (B100) is not a hazardous substance so has no HSNO classification. However, biodiesel blends should be stored and handled in the same way as ordinary diesel.

Implementation issue

In late 2009 a fuel filter in an Explore NZ catamaran started clogging repeatedly – indicative of a fuel problem. Environ Fuels quickly isolated the problem to a batch of fuel where soybean oil, supplied to them by mistake, had been inadvertently used in the manufacturing process, alongside the usual canola oil. Soybeans have different biochemical properties to canola; the result was a batch of biodiesel with higher levels of glucosides – the microscopic particles causing the filter to clog.

The incident quickly saw a range of new safeguards added to the production chain. Says Environ Fuels director Toby Littin, "We put in tighter front-end quality control, added several new steps to our manufacturing process, and installed finer, 0.6 micron filters (down from 1.0 microns) at the delivery end. We've also put in place cross-guarantees and indemnities from our feedstock suppliers.

"Inadvertently, that incident did us a huge favour. Thanks to the measures introduced because of it, we're now more confident than ever in the quality of our fuel."

Explore NZ was pleased with their supplier's swift response, and the actions taken to rectify the matter. "It's given us the confidence to continue," says William Goodfellow.

Moving forward

With B20 having proven successful, Explore NZ sees B100 as the next step for their fleet. Assuming they can strike a favourable rate with their supplier, their generator at Otehei Bay (a remote Bay of Islands tour destination) will switch to it in the near future, followed by the fleet's yachts; other vessels and vehicles will progressively follow.

Key personnel

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Explore NZ's perspective

**William Goodfellow,
Managing Director:**

"With all of the benefits that biodiesel brings, and having the same positives as ordinary diesel, it became a no-brainer for us to switch across. It just made perfect sense."

"We also wanted to be a leader in our industry, to encourage as much pickup (of biofuels) as possible. Since we switched to biodiesel, Environ Fuels has received dozens of enquiries from other firms citing our company, and some have gone on to make the conversion to biodiesel. It's pretty neat to see that others really do take notice and are confident to replicate our example."

"We didn't want an exclusive on this stuff – we genuinely wanted the tourism and marine industries to adopt it. So we've worked with Environ Fuels and the Far North District Council to put a biodiesel facility on the Opua Wharf (near Paihia). It's been an opportunity to make a real difference in the Bay of Islands. We're really excited about that."

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