

Ocean Fisheries – biodiesel benefits on sea and land

A suggestion to trial biodiesel on one of Ocean Fisheries' trawlers has seen the Lyttelton firm so convinced by the benefits of the fuel it has progressively changed all its vessels to run on biodiesel blends - including its delivery trucks – and commission a \$2 million dollar trawler that runs exclusively on biodiesel.

About Ocean Fisheries

A family-run business founded in 1967 by marine engineers Stark Bros Ltd, Ocean Fisheries' three fishing vessels ply the South Island coastal waters from Picton to Timaru, trawling for table fish like red cod, hoki, warehou and terakihi. They net some 2,000 tonnes of fish every year, sold fresh to Christchurch markets for on-sale to shops and restaurants.

Engine benefits appeal

Ocean Fisheries was approached in 2006 by Biodiesel New Zealand, suggesting they trial one of their trawlers on biodiesel. Their contact at Biodiesel New Zealand was a former Lyttelton mechanic, well known to the firm's managers and trusted by them. Biodiesel's engine-friendly qualities – cleaner burning and more lubricating than ordinary diesel – strongly appealed to the fishing firm, whose business depends upon well-running, breakdown-free vessels.

A gradual move to biodiesel

Prior to switching from ordinary diesel to biodiesel blends, Ocean Fisheries liaised with their vessels' motor manufacturers – who recommended using a blend of no higher than 5% biodiesel with ordinary diesel. Deeming that figure overly cautious, given demonstrated safe use at higher percentages, and too diluted to deliver any significant engine-related benefits, Ocean Fisheries proceeded with plans to use higher percentage blends. A major factor in this decision was their confidence in Biodiesel New Zealand's technical expertise and support, and in their ability to supply high-quality fuel – made to the European Standard, EN14214 – on an ongoing basis.

The 19 metre trawler Frontier was the first of the fleet to trial a biodiesel blend. From July 2007 it has successfully used both B20 and B60 blends (20% and 60% biodiesel blended with ordinary diesel). The 13 metre trawler Nessie J joined the fleet in March 2009, and uses B20.

A state-of-the-art new trawler, the 16 metre Jubilee, was launched in January 2008, fitted with a 350 HP Scania motor (DI 12 59M) designed to run on 100% biodiesel (B100). The motor was no problem to source, says Tim, and no more expensive than other diesel motors. They went through sign-off with Scania in New Zealand and overseas to verify the engine would be able to run on the fuel and maintain 100% new engine warranty. The Jubilee is believed to be the first commercial fishing vessel in New Zealand to run on B100, and possibly the first new commercial engine on land or sea to do so.

Additionally, the firm's 12 trucks, which haul fishing gear and other cargo, and deliver the Lyttelton fishing fleet's catch, also use B20.

The Jubilee is believed to be the first commercial fishing vessel in New Zealand to run on B100, and possibly the first new commercial engine on land or sea to do so.



✓ Key features

- Two trawlers running on B20, one trawler running on B100
- No extra investment required to use biodiesel
- Fuel and maintenance costs remain the same
- Extra fuel filter changes are required initially after switching to biodiesel

✓ Key benefits

- Better engine performance
- Tanker delivery makes refilling easier
- Reduced greenhouse gas emissions provide a marketing angle

✓ Sector relevance

- Transport industry
- Fishing industry
- Marine industries

Technology overview

- Biodiesel blends are blends of a percentage of biodiesel mixed with ordinary diesel. The percentage of biodiesel in the blend is indicated by the 'B' name – B5 for a 5% blend of biodiesel with 95% ordinary diesel, B20 for 20% blend of biodiesel with 80% ordinary diesel, and so forth.
- 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.
- 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.
- Greenhouse gas reduction for the three vessels of more than 35% annually, compared with ordinary diesel.



Implementation and benefits

The transition to biodiesel proved easy and inexpensive. The one prerequisite, however, was replacing the fuel filters twice soon after commencing the Frontier and Nessie J on biodiesel – a normal requirement for engines switching to biodiesel (see 'Technology overview').

The fleet has experienced no problems running on biodiesel – important in an industry where safety is critical, given the risks if a vessel breaks down while out at sea. Their fuel and maintenance costs have remained the same. Claims that biodiesel burns more cleanly have been observed in practice, with staff noting that exhaust deposits are much lighter and less tarry than with ordinary diesel.

Although the engine maintenance aspects were what initially attracted Ocean Fisheries to using biodiesel, further advantages have also become apparent to them:

- Biodiesel is more biodegradable than ordinary diesel and will break down in water – a definite plus for maritime businesses, which have to bear the clean-up costs of any fuel spills they cause.
- The firm's biodiesel supplier sends its tanker to refuel the vessels directly at the wharf, saving Ocean Fisheries the time and effort of refuelling the boats at local marine diesel pumps.
- One advantage Ocean Fisheries hasn't yet tapped into is the potential marketing opportunities for businesses using biodiesel. "It's eco-friendly and has fewer pollutants. We're looking to push that aspect a bit more in the future," says Tim.

Key personnel

Tim Stark (Marine Manager, Stark Bros Ltd) tim@starkbros.co.nz

MARCH 2010/EEC1345



For more information contact The Energy Efficiency and Conservation Authority:

EECA HEAD OFFICE: PO Box 388, Wellington, (04) 470 2200

EECA AUCKLAND: PO Box 37444, Parnell, Auckland, (09) 377 5328

EECA CHRISTCHURCH: PO Box 13983, Christchurch, (03) 353 9280

Freephone 0800 358 676 | www.eeca.govt.nz/biofuels



Ocean Fisheries' perspective

Tim Stark, Marine Manager

"The changeover to biodiesel was pretty smooth really. It's very user friendly – we just tipped it straight into the fuel tanks. And after the initial fuel filter changes were done, it was all go.

"Biodiesel has got a lot more lubricity than normal diesel, which is good for the engine. We haven't had to do a rebuild yet on any of the motors since they changed to biodiesel, but I'm sure the fuel injectors will last longer, because they've got less wear on them.

"The Jubilee is running brilliantly. It's done 9,000 hours now, with no problems at all. It runs cleanly and burns (B100) very, very well. You can't even see any black down the exhaust pipe – which is pretty good for a diesel!

"Having the tanker come and fill the boats up at the wharf is an added bonus. It saves our guys having to go to the bowser, which saves us a couple of hours a week. It's one less hassle."