



**SUBMISSION TO GREEN GROWTH ADVISORY GROUP  
BY  
ECODIESEL LIMITED  
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**INTRODUCTION**

Production of biodiesel from tallow feedstock is an opportunity to sustainably grow the production of biofuels in New Zealand on a basis that will significantly reduce greenhouse gas (GHG) emissions using unique, proven New Zealand developed and patented processing technology, which is available now, and could potentially replace up to 5% of New Zealand's conventional diesel fuel consumption in the transport sector.

Biodiesel from tallow can have a favourable impact on all three topics covered in the Green Growth Advisory Group discussion paper of July 2011, and the terms of reference for the advisory group:

1. How New Zealand, and in particular government agencies, can help exporters, leverage greater value in international markets from our "clean green" brand;
2. Opportunities for smarter use of existing technologies and innovation, as well as greater development and adoption of new technologies (including clean technologies) in our productive sectors: and
3. Options for our small and medium sized businesses to move to a lower carbon economy while sustaining the desired level of productive growth.

**BIODIESEL INTERNATIONALLY**

Biodiesel is a substitute for conventional, mineral diesel fuel, and is manufactured from vegetable oils, used cooking oils, or animal fats. It can be easily blended with mineral diesel fuel, as its properties and performance in a diesel engine are essentially the same. Similarly, it requires no specialised storage, blending or distribution facilities, unlike bioethanol, the other common biofuel.

Internationally, most biodiesel is manufactured from vegetable oils and used cooking oils, using high temperature, high pressure process technology developed in Europe. This technology has great difficulty processing animal fats, or tallow. This is because tallow is solid at room temperature and requires extensive, and expensive pre-treatment

before it can be handled by European process technology, plus distillation of the finished biodiesel. Hence the international focus on vegetable oils, and to a lesser extent the smaller volumes of used cooking oils.

In Australia, efforts to use tallow (of which there is an abundance), rather than vegetable oils, have largely failed to date, despite significant Government support, because the Australian plants are all based on European high temperature, high pressure process technology.

## **BIODIESEL IN NEW ZEALAND**

There has, to date, been very limited production of biodiesel in New Zealand, mainly from used cooking oil, of which only about 4 million litres per annum is available. As in Australia, the process technology, with one exception, is based on the European model.

Like Australia, New Zealand has an abundant supply of tallow, or animal fat, from the meat and dairy sectors of our farming industry. Currently, New Zealand produces about 160,000 tonnes per annum of tallow, of which approximately 85% is inedible and can't be used as a food extender. So, almost all New Zealand's tallow is exported as a relatively low value commodity product to markets in China and Asia.

If the exported tallow could be processed in New Zealand, there is the potential to produce 130 million litres per annum of biodiesel which could be substituted for mineral diesel. Based on EECA's assessment of a GHG reduction of 77% CO<sub>2</sub> equivalent for every tonne of mineral diesel replaced by a tonne of tallow based biodiesel, this could reduce New Zealand's GHG emissions by 100,000 tonnes CO<sub>2</sub> equivalent per year.

## **BIODIESEL FROM TALLOW IN NEW ZEALAND**

As noted above, the very limited production of biodiesel in New Zealand to date has been mainly based on used cooking oil, because the plants are small scale, but more importantly, they cannot process tallow, being based on European technology.

The one exception to this is the unique, patented low pressure, low temperature process technology developed in Auckland by the organic chemist who founded Ecodiesel. This development, specifically designed to handle tallow, took nearly ten years to become a successful pilot plant, which is the basis for a 20-40 million litres per annum partially constructed (but now "mothballed") production plant in Auckland. This process also incorporates distillation as the final process step, similar to the final process step in manufacturing mineral diesel.

An Ecodiesel process technology based plant costs less than half the per unit construction cost of a typical European process technology plant. It also costs less than half the per unit cost of production to operate.

Additionally, the Ecodiesel process produces no waste by-products, with all feedstock, water and chemicals being recycled, or used to produce a small volume of saleable glycerine, in addition to biodiesel. The plant can be designed to be self sufficient, in that it can generate all its own fuel requirements.

Biodiesel from Ecodiesel's pilot plant has been tested and approved by the corporate laboratories of the world's largest international oil company, and successfully trialled by them in New Zealand. The product has been proven to meet all the major oil companies' specifications for biodiesel and the New Zealand specifications for biodiesel.

## **GOVERNMENT SUPPORT FOR BIODIESEL IN NEW ZEALAND**

Around the world, biofuels enjoy direct, and indirect government support, in the form of production subsidies for biofuels producers and/or mandated minimum offtake by mineral fuels marketers. In some cases, capital grants, to assist in plant construction are also available. This government support recognises the inability of the biofuels industry, at least initially, to compete with the scale and distribution reach of the oil industry in most markets, and the general lack of incentives for the oil industry to embrace biofuels, with its sunk investment in refining and marketing mineral fuels. In Australia, the biofuels industry has enjoyed excise duty exemptions for several years, and these were recently renewed for a further ten years, at levels comparable to the BGS in New Zealand.

In New Zealand, the Labour Government introduced a mandated minimum offtake regime, which would take biofuels up to a minimum 2.5% of all fuels over a five year period beginning in 2009. However, the National government, on winning office in November 2008, immediately repealed Labour's regime, and promised to replace it with incentives which treated biodiesel and bioethanol equally. (Bioethanol has long enjoyed an exemption from petrol excise duties, now worth 48.5 cents per litre). In May 2009, the National government introduced the Biodiesel Grants Scheme (BGS) under which locally produced biodiesel attracted a grant of 42.5 cents per litre (then equal to bioethanol), but the BGS was limited to three years, expiring in June 2012 and with limited total funding. Hence biodiesel was not treated equally with bioethanol, which continued to enjoy an open ended exemption from petrol excise duty that has increased in value as petrol excise duty has increased.

(New Zealand is unique in the world, with no excise duties on diesel, but with Road User Charges paid separately by owners of diesel powered vehicles instead. Hence the need for the BGS for biodiesel in the absence of a mandated offtake regime).

Because the BGS is time limited, local biodiesel producers like Ecodiesel have been unable to raise the capital investment to complete, or expand their plants, and the biodiesel industry is on the point of collapse, with multi-million dollar losses to existing investors in the case of Ecodiesel. This was addressed by the Parliamentary Commissioner for the Environment in her June 2010 report on biofuels, when she recommended local production of biodiesel should be encouraged and that the BGS

should be extended beyond June 2012 because that *"is not a long enough horizon to encourage investment in production facilities"*.

Ecodiesel has New Zealand's largest (and now locally owned) oil company waiting to invest the capital needed to complete Ecodiesel's Auckland plant within 6-8 months, and to invest in storage and blending facilities in its fuels terminals to distribute blends of biodiesel and mineral diesel throughout the upper half of the North Island. However, they will not, understandably, do so under the current June 2012 time limit on the BGS.

A recent study completed for Ecodiesel has shown that the cost of the BGS compares favourably to the two other energy saving programs being promoted by the Government.

Cost of Carbon Saved (\$NZ/tonne CO <sub>2</sub> equiv)	Biodiesel (BGS) (tallow based production)	Home Insulation Grant Scheme	Solar Hot Water Grant Scheme
10 Yr Average	163	310	253
20 Yr average	132	185	172
30 Yr Average	108	144	145

A copy of that study is attached. We recognise that in the case of the Home Insulation Grant Scheme there are (unquantifiable) health benefits from warmer, drier homes, that the study does not incorporate, but the cost differential in favour of the BGS is still significant.

Finally, notwithstanding the anticipated impact of the ETS, or other Government programs to reduce diesel fuel consumption, the use of biodiesel further reduces GHG emissions by 77% for every litre of biodiesel substituted for mineral diesel. Thus, biodiesel ensures an additional, quantifiable benefit for GHG reduction and/or Green Growth regardless of any other initiatives the Government adopts.

## **CONCLUSION**

Locally produced biodiesel should be encouraged, and supported by Government, through a meaningful extension of the BGS beyond June 2012, so that biodiesel can make a constructive contribution to Green Growth, starting in 2012, in the following ways:

### Topic 1

Exporters can leverage greater value in international markets by emphasising the use of biodiesel in the New Zealand transport sector – road fleets, KiwiRail and Air NZ (and other airline) ground fleets; and on farm and orchard/vineyard equipment.

Tourism operators can demonstrate the use of biodiesel in their bus and camper van fleets. The availability of biodiesel at service stations will enhance our "clean green"

brand, compared to the present situation where tourists from other OECD countries, who are used to seeing biofuels in their home countries, see nothing of them in New Zealand.

The Ecodiesel technology could be exported to the Pacific Islands and used to produce biodiesel from surplus coconut oil for power generation, based on the low cost of construction and operation, plus its standalone capability in terms of zero waste and ability to fuel itself. This would help overcome the high cost of mineral diesel for power generation in the Pacific Islands, and contribute to economic development there.

## Topic 2

The Ecodiesel process technology is an example of smarter use of existing technologies and innovation, and an example of the adoption of new, clean technologies in our productive sectors.

The establishment of a commercial scale biodiesel industry in New Zealand now will provide a platform for the export of existing process technology, like Ecodiesel's, and the development of next generation biofuel technologies (which are still at least 5-10 years away).

## Topic 3

SMEs are the predominant form of business in New Zealand, but their size often makes them feel they are precluded from making a meaningful individual contribution to GHG reduction. Encouraging them to use locally produced biodiesel, and to encourage their suppliers to do the same, will help them move to a lower carbon economy without increasing their costs or reducing productive growth. This will demonstrate that a lower carbon economy does not necessarily mean lower productive growth, and will encourage SMEs to embrace other ways in which they can support and adapt to a lower carbon economy without assuming it must lead to lower productive growth.

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Auckland  
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