



Parliamentary Commissioner for the
Environment
Te Kaitiaki Taiao a Te Whare Pāremata

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Biofuel Bill

Briefing to the Local Government and Environment Committee

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1. Introduction

Thank you for the opportunity to comment on the Biofuel Bill.

Over recent months the international debate about the sustainability of biofuels and the true environmental and economic impacts has heated up immensely. Early this year the Environmental Audit Committee of the UK House of Commons advised the government to place a moratorium on policies aimed at increasing the use of biofuels until rigorous biofuel standards are in place (1). The European Commission is considering a ban on biofuels deemed environmentally unfit. A UK Royal Society report (2) and recent US studies published in Science (3, 4) all critically assess the feasibility of biofuels as a sustainable fossil fuel alternative. This upsurge in concern about biofuels signals the need for caution.

2. Clarifying the purpose of the Bill

The purpose of the Biofuel Obligation is stated in the Bill as *‘to ensure that biofuels are supplied in New Zealand.’*

Beyond that, however, the true purpose lies in why we might think biofuels represent a good way forward. In this context, the Regulatory Impact Statement of the Biofuel Bill states: *‘Biofuels can help reduce our net carbon emissions and make the supply of energy, particularly for transport, more diverse and ultimately more secure.’*

Accordingly, the driver for obligating the introduction of biofuels into our transport fleet is two-fold:

- to reduce carbon dioxide emissions; and
- to increase the security of our supply of transport energy.

Biofuels are, or may be, a means to achieving lower carbon dioxide emissions and energy security. This briefing is focused on assessing how well the Biofuel Bill will deliver on these two goals.

3. Reduction of carbon dioxide emissions

Earlier this year, Britain’s National Academy of Sciences - the Royal Society – issued a report on the prospects and challenges of sustainable biofuels (5), drawing attention to the net carbon dioxide emission reductions across different biofuels. This variation in emission reduction is also a theme in many of the submissions the committee has received on this Bill.

Biofuels appear to be carbon-neutral, because plants absorb carbon dioxide as they grow and this is equal to the carbon dioxide emitted when the fuel is burned. However, this does not account for the carbon dioxide emitted during cultivation and processing into fuel. A lifecycle assessment of carbon dioxide emissions is required to capture the emissions of the full production process.

Lifecycle assessment

A particularly thorough lifecycle assessment of biofuels has been undertaken in Switzerland. In 2007 the Swiss government commissioned the Swiss Federal Institute for Materials Science and Technology to compare greenhouse gases emitted by biofuels with those of fossil fuels (6). The results are summarised in Figure 1 (refer page 9).

Figure 1 shows four groups of fuels: biodiesel, alcohol, methane (three types of biofuels), and fossil fuel. The different colours represent the greenhouse gases emitted at different stages of the lifecycle of each fuel. The greenhouse gases are measured in carbon dioxide equivalent. Most of the greenhouse gas emissions are actually carbon dioxide, and are referred to below collectively as carbon dioxide for simplification.

Only the fossil fuels have a dark grey component – the carbon dioxide emitted from vehicles as the fuel is burned. In contrast, the biofuels have no dark grey section because the carbon dioxide emitted during combustion is neutralised by the biofuel plants absorbing carbon dioxide through photosynthesis as they grow.

The green sections on the chart show the carbon dioxide emitted during cultivation – so fuels made from waste have no green section.

The study shows that the largest percentage of biofuel carbon dioxide emissions comes from agricultural cultivation (Figure 1, green). The processing of the biomass into fuel (Figure 1, yellow) causes on average much lower carbon dioxide emissions than agricultural cultivation.

The lowest overall carbon dioxide emissions are achieved by biofuel made from waste products (i.e. used cooking oil, whey, liquid manure).

While these are not New Zealand numbers, the study shows that there are large variations in carbon dioxide emissions across fuels and in some cases across countries. Ethanol from corn in the United States, for example, is a very poor performer with total carbon dioxide emissions close to those of diesel. In comparison, biofuels from waste considered in the study were found to emit up to 80% less carbon dioxide over their lifecycle than fossil fuels.

Implications for the Biofuel Bill

The Bill's mechanism for ensuring biofuels emit significantly less carbon dioxide over their lifecycle than fossil fuels is in clause 34G '*Definition of Qualifying Biofuels*'.

Clause 34 states the default position that biodiesel and bioethanol qualify as biofuels. Alternatively an Order in Council may prescribe a range of qualifying criteria.

If this Bill becomes legislation, there will be a need for such an Order-in-Council. At a minimum, the Order-in-Council should contain a biofuel lifecycle carbon dioxide reduction standard. However, I would prefer to see such a standard in the primary legislation. Otherwise the real purpose of the Bill would be undermined.

Just ensuring a positive net reduction in carbon dioxide would not go far enough to make a New Zealand Biofuel Obligation worthwhile. The European Commission, for example, is considering a biofuel 35% carbon dioxide emission reduction standard over fossil fuels.

Alternatively, the Emissions Trading Scheme will reduce the cost of low carbon footprint fuels relative to high carbon footprint fuels. One of the big advantages of such a market instrument - fully implemented - is that it takes away the need to do complex carbon footprint calculations.

4. Energy security

I now consider energy security, the second purpose of the Bill, in more depth. Energy security matters environmentally because supply failure will send environmental concerns to the bottom of the agenda. To guard against supply failure, the Bill allows importation of biofuels.

Considerations for environmental and societal harm

The current international turmoil over biofuels is driven by two developments. The first is the felling of carbon-absorbing rain forests for planting large-scale plantations of biofuel crops like palm oil. The second is that many first generation biofuels – soy, corn, sugar cane, and rapeseed – compete directly with their uses for food and animal feed.

Worldwide arable land is a limited resource and will be even more so with water shortages expected from climate change. In January this year, there were large-scale street protests in Indonesia, protesting against increased food prices triggered by biofuel production.

The Biofuel Bill does not prohibit importing biofuels to ensure that the mandatory percentages are met. The mechanism for dealing with rainforest and food price problems again is clause 34G(2)(e): *‘... for example, specifications providing that qualifying biofuels must be produced from biomass grown without causing undue environmental harm and without unduly impinging on food production.’*

How practical and expensive will it be to develop such standards, and monitor and enforce compliance offshore? I remain to be convinced that this is a feasible way forward.

Clean green image

Our international clean and green image is another aspect to consider. Although we struggle to make the reality fit our clean-green image, we trade on this image; it is core to our national identity and it is the brand of many of our companies. New Zealand is a country with a low population density and an economy largely based on biological production. If we cannot produce our own biofuels, who can? Importing biofuels risks damaging our clean green image.

Many countries see energy security in terms of national self-sufficiency, but this country tends not to - not since the discrediting of the “Think Big” era. But it is not at all clear how importing biofuels will contribute to our energy security.

Implications for the Biofuel Bill

Thus, there are at least two reasons against importing biofuels to meet the Biofuel Obligation.

- the difficulty and cost in verifying production pathways offshore; and
- the risk to New Zealand’s clean green brand.

5. Domestic production of biofuels in NZ in the short-term

If we do not import biofuels, what domestic production can we expect in the short-term over which the obligation builds up?

There is bioethanol from whey. Fonterra produces about 20 million litres of whey-derived ethanol annually and sells around 10% of this as fuel – this is not a large quantity. All ethanol currently sold by Gull is sourced from Fonterra.

There is biodiesel from tallow, though there are some problems yet to be resolved with its behaviour in cold temperatures. New Zealand produces around 150,000 tonnes of tallow annually, 85% of which is currently exported. Thus the quantity remaining in New Zealand is not large.

Lastly, there is biodiesel from rapeseed, a feedstock of interest to Solid Energy. I would caution that mandating the production of a defined quantity of biofuel that is likely to be predominantly provided by one company would provide an opportunity for monopoly profiteering.

6. If not a Biofuel Obligation, then what?

Second generation biofuels

If biofuels are to be a major component of transport fuel in New Zealand, they will need to be second generation biofuels which would use much more of the plant biomass.

Biodiesel from rapeseed is “first generation” as only a very small part of the biomass is used. Ethanol from wood would be a “second generation” biofuel. But second generation biofuels will not be available over the time scale of this Obligation. Further, it may well be that before second generation biofuel technology is fully developed, electricity will have provided a better way to power our transport fleet.

Research funding

The current system of research funding incentivises scientists to exaggerate the commercial feasibility of their work, and expectations of biofuel production may have been inflated by this.

If the domestic production of biofuels is considered a strategic matter of national importance, then ring-fencing and targeting of research funding tied to the production of results could be considered. However, I am old enough to remember the Liquid Fuels Trust Board and the Motunui synthetic petrol plant. Picking winners on a Motunui scale is a risky business.

Demand side management

We need to focus on the demand side as well as the supply side – we need to focus on our ever-increasing consumption of transport energy. Over the last ten years, petrol consumption in New Zealand has grown by 11%, and diesel consumption has grown by 38% (7). Curbing the rate of growth of transport energy consumption needs to be done with at least as much enthusiasm as the production of alternative fuels.

Demand reduction is a difficult area; aspirations are easy, but results require more.

For instance, this country has been remarkably slow in taking measures to increase the efficiency of the vehicle fleet. In the UK, for example, cars are placed into seven different registration tax classes based on fuel type and carbon dioxide emissions, so that owning a “Chelsea tractor” is very expensive, even without driving it. In Germany there are eight tax classes based on engine size, fuel type and carbon dioxide emissions.

The Ministry of Transport has recently released a discussion paper titled “Improving the fuel economy of vehicles entering the New Zealand fleet”. It is extremely important that this leads to a real change.

7. Conclusions

- Different biofuels from different sources have widely varying carbon footprints.
- If this Bill does become legislation, a lifecycle carbon footprint reduction standard should be incorporated into the statute.
- Importing biofuel while avoiding contributing to the hugely damaging environmental and social impacts occurring in countries like Indonesia and Malaysia would be difficult and very expensive.
- Importing biofuels would also be inconsistent with our clean green image.
- The potential for domestic production of biofuel is limited in the short term.
- There is a strong case for waiting for the second generation of biofuels before getting serious about them. However, electric motive power may be a much better option.
- As a country we need to get serious about curbing the growth in transport energy consumption.

8. Recommendation

I recommend that the Biofuel Bill not proceed.

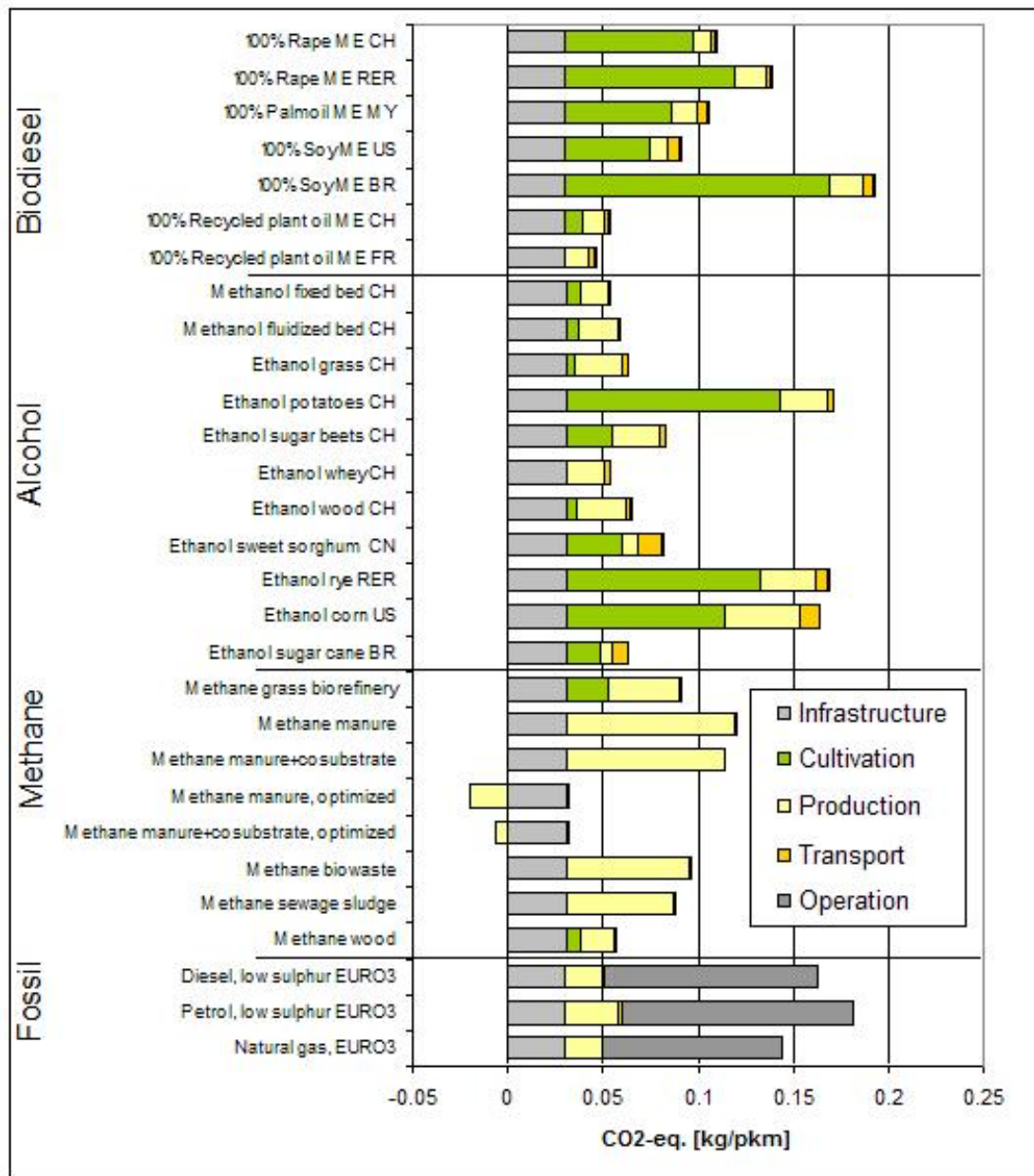


Figure 1. Comparison of greenhouse gases emitted by biofuels and fossil fuels. Emissions are broken down into individual processes of the value chain. (Source: Zah *et al* 2007)

9. References

- (1) House of Commons Environmental Audit Committee. 2008. *Are biofuels sustainable?* First report of session 2007-08, vol 1. <http://image.guardian.co.uk/sys-files/Environment/documents/2008/01/18/EACbiofuelsreport.pdf>
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