

Biofuels Sales Obligation

A DISCUSSION PAPER ON PROPOSED POLICY

September 2006

**DISCUSSION
PAPER**



BIOFUELS SALES OBLIGATION

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Ministerial Foreword

The Government is committed to encouraging the uptake of biofuels in New Zealand. The use of renewable energy will contribute to the creation of a sustainable energy system and makes our supply of transport fuels more secure and diverse.

Transport in New Zealand is heavily dependent on imported fuel, with petrol and diesel made from imported oil making up approximately 37% of our current energy demand. Biofuels can help reduce this reliance while utilising New Zealand's resources to produce biofuels. Domestic tallow, a by-product of the meat industry, for example, can be used to produce biodiesel, and whey, a by-product from the dairy industry, can be turned into bioethanol for blending with petrol. The introduction of a domestic biofuels industry is expected to bring economic development benefits. The option to import biofuels also exists.

Biofuels also have climate change benefits because when biofuels displace petrol and diesel our net carbon dioxide emissions are reduced. Other harmful emissions are also displaced, with positive impacts on air quality and human health.

In August 2005, the Government agreed in principle to a Biofuels Sales Obligation. For consultation purposes, this discussion paper outlines the proposed policy for this obligation. Once the finalised policy for this obligation is in place, from 2008 oil companies operating in New Zealand will be required to sell biofuels as a percentage of their annual petrol and diesel sales.

The purpose of this discussion document is to get your input. I encourage you to take the time to make a submission.

Hon. Judith Tizard
Associate Minister of Transport

Making a Submission

We welcome and encourage your submission on the proposed Biofuels Sales Obligation as set out in this document. Questions are provided to assist, general comments are also welcome.

Please include in your written submission:

- the title of this document;
- your name (and title, if applicable);
- your organisation's name (if applicable); and
- your address (postal and email, if applicable).

Please refer to the questions asked in each section of this report when making your submission. Comments on other aspects of the Biofuels Sales Obligation are encouraged.

Please note the deadline for receiving submissions is Friday 20 October 2006.

Please send your submission to:

Enabling Biofuels Project Manager
Environment Group
Ministry of Transport
PO Box 3175
Wellington

You can also email your submission to: biofuels@transport.govt.nz or use the submission form online at www.transport.govt.nz

Confidentiality

Please note that submissions provided on the discussion paper will be subject to the provisions of the Official Information Act 1982. This Act requires information to be made available on request unless there is good reason to withhold the information.

If you do not wish any material provided in your submission to be released, please specify the material that you wish to be withheld and the grounds (as set out in the Act) for withholding it. The decision on whether to release the material under the terms of the Act rests with the Ministry of Transport. Any decision to withhold information is subject to appeal to the Ombudsman.

Executive Summary

Biofuels are fuels produced from biomass. Biofuels used in transport are most commonly used in petrol and diesel engines. Biofuel blends are widely used in transport around the world. The United States, Canada, most European countries, Australia, Brazil, China, India and Thailand all use biofuel blends. The government is committed to encouraging the uptake of biofuels in New Zealand for a number of reasons including creating a sustainable energy system by using renewable energy, reducing our net carbon dioxide emissions and contributing to the security of supply and diversity of transport fuels. The Biofuels Sales Obligation is the proposed policy for achieving this.

The Biofuels Sales Obligation will require firms that sell petrol or diesel in New Zealand to also sell biofuels. The amount will be set as a percentage of total combined petrol and diesel sales per year, measured in petajoules, based on the volumetric energy content of each fuel, as follows:

Year 1	Year 2	Year 3	Year 4	Year 5
2008	2009	2010	2011	2012 onward
0.25%	0.75%	1.5%	2.25%	2.25%

The Biofuels Sales Obligation can be met with any biofuel sold as a direct replacement for petrol or diesel in New Zealand. The biofuels can be produced domestically or imported and can be sold at any blend level provided they meet fuel quality specifications. The proposed obligation will include a roll-over option for year 1 and year 2 (expected to be 2008 and 2009) so firms can delay providing biofuels to the market in the short-term. As biofuel supply is not an existing industry, it is recognised that it may be practically difficult to supply biofuels in the early years of the obligation.

A penalty of \$60 million per petajoule of biofuel for which a firm is short of their obligation is suggested to apply from year 3 (expected to be 2010). It is proposed that liable firms can trade with each other or any other firm in order to meet the obligation. Limited banking of up to 5% of each year's obligation is also proposed. It is proposed that a review of the obligation be carried out 2 years after being implemented (the review is expected to take place during 2010). The government agency responsible for administration of the obligation will establish reporting, monitoring, auditing and verification systems. The existing exemption from excise duty enjoyed by bioethanol will continue until 2012.

There is currently no legislation to implement a Biofuels Sales Obligation or to specify the quality of biofuels and biofuel blends. Therefore new legislation or amendments to the current legislation is needed. For biofuels quality, it is proposed that this legislative framework will utilise the current New Zealand Biodiesel Standard NZS 7500:2005 and the Energy Efficiency and Conservation Authority voluntary standard on bioethanol as the basis for

development of fuel quality specifications for biodiesel and bioethanol, respectively. It is also proposed that the current penalty for non-compliance with fuel quality standards is extended to biofuels and that the Petroleum Fuels Monitoring Levy is extended to biofuels, to enable adequate levels of monitoring.

Consumer information about biofuels will be vital to its successful roll out. Therefore, it is proposed that legislation is put in place to require suppliers to provide information about biofuels. Provisions will be made to ensure that required information needed to ensure firms are meeting the obligation can be accessed.

Whether, for the purpose of retail sales, biodiesel blends should be labelled is an open question. At this point there is not a preferred position. It is proposed that all retail sales of bioethanol blends are required to be labelled.

Questions have been raised as to whether the current technical specifications for petrol and diesel as set out in the Petroleum Product Specification Regulations are optimal to ensure that blending of bioethanol and biodiesel with petrol and diesel, respectively, results in fuel that is 'fit for common purpose'. Analysis of the appropriateness and level of potential waivers from the petrol and diesel specifications in the Petroleum Product Specification Regulations for retail biofuel blends is currently being undertaken.

Vehicle risks are considered manageable in the context of the Biofuels Sales Obligation. It has been designed in such a way that the sale of high level blends of biofuels will not be required to meet the obligation. It is a sales obligation to give full flexibility to liable firms – so that they can decide which biofuel blends to sell into specific markets and the timing of those sales. Also, in order to meet the proposed obligation, biofuels quality standards must be met. Such standards will reduce vehicle risks. A programme to provide key information to relevant stakeholders and consumers will aid the transition to biofuels. Government plans to facilitate this programme.

TABLE OF CONTENTS

Ministerial Foreword	2
Making a Submission	3
Executive Summary	4
Introduction	7
The Proposed Biofuels Sales Obligation	10
Biofuel Quality Regulation, Monitoring and Information Disclosure	24
Technical Issues with Blending, Distributing and Labelling Biofuels	29
Management of Vehicle Risks	34
Glossary	36
Appendix: Form and content of the Biofuels Sales Obligation Annual Report	39

Introduction

What are biofuels?

1. Biofuels are fuels that are derived from biomass (recently living organisms such as wood) or their metabolic by-products, such as manure from cows. They are a renewable energy source, unlike other natural resources such as petroleum, coal and nuclear fuels. For the purposes of the Biofuels Sales Obligation, the term biofuels refers to those biofuels which are used as a direct replacement for petrol or diesel in petrol or diesel engines. Such biofuels can either be used 'neat' or blended with petrol or diesel. The material used to produce biofuels is referred to as 'feedstock'.

Types of biofuels

2. The most common biofuels used to replace petrol and diesel are biodiesel and bioethanol. These are the two biofuels that we expect to see first in New Zealand for use in transport.
3. Biodiesel is made from vegetable oils or animal fats (i.e. tallow) and is most commonly blended with diesel for use in compression-ignition (diesel) engines. Biodiesel is typically produced by mixing animal or vegetable oil and methanol, in the presence of a catalyst. Along with biodiesel, a by-product glycerol is produced.
4. Bioethanol is produced by the fermentation and distillation of sugars and starches. It is most commonly blended with petrol for use in vehicles with spark ignition (petrol) engines.
5. The methods described above for producing biodiesel and bioethanol are known as first generation biofuel technologies. Research is underway internationally and in New Zealand into second generation biofuel technology, such as bioethanol manufactured from cellulose like wood or straw. Such second generation biofuel technologies are unlikely to become economic in New Zealand in the short-term.

Biofuels around the world

6. Biofuel blends are widely used in transport around the world. The United States, Canada, most European countries, Australia, Brazil, China, India and Thailand all use biofuels and biofuel blends. The most common feedstocks used include palm oil, rapeseed, soybean, sugar cane and maize.
7. Brazil produces the greatest volume of bioethanol, having produced an estimated 15 billion litres in 2005. Germany produces the greatest volume of biodiesel, with production of 1.5 billion litres in 2005.

Why biofuels?

8. The government is committed to encouraging the uptake of biofuels in New Zealand for a range of reasons. The use of renewable energy contributes to the creation of a sustainable energy system for New Zealand, **reduces our net carbon dioxide emissions** and **makes the supply of transport fuels more secure and diverse**.
9. Biofuels are a valuable addition to our fuel sources, replacing some diesel or petrol as a fuel for transport and other uses. Because they are made from biological, renewable sources they assist in meeting climate change objectives. As the plant or animal material is renewed, carbon dioxide (CO₂) is captured from the atmosphere. The CO₂ is therefore in a cycle rather than going one way from a fossil source (petroleum oil) to the atmosphere.
10. Air and water quality also benefit from the use of biofuels. Using a biodiesel blend in place of neat diesel has a number of other benefits, which include reduced emissions of concern to air quality and human health, better fuel lubrication and reduced deposits in diesel engines. Biodiesel is also non-toxic, biodegradable and speeds up the breakdown of spills of petroleum diesel that it is blended with. Using a bioethanol-petrol blend in place of neat petrol overall provides some air quality benefits when some harmful petrol emissions are displaced. In several international jurisdictions, bioethanol is a preferred octane enhancer¹ and/or oxygenate because of its relatively low adverse environmental impacts.
11. The development of a biofuels industry also provides opportunities for regional development and new markets for by-products.

The government commitment to biofuels

12. In 2001 the government indicated in the **National Energy Efficiency and Conservation Strategy** (NEECS) that it wanted to promote greater energy efficiency and use of renewable energy across the economy. The Strategy included a national renewable energy target, and indicated that renewable transport fuels could provide a proportion of that target: 2 petajoules by 2012. 2 petajoules is roughly 1% of our current annual use of petrol and diesel.
13. Despite the NEECS voluntary target, biofuel blends have yet to be commercialised in New Zealand. Following assessment of the most appropriate way to encourage uptake of biofuels, in August 2005 the government agreed in principle to the introduction of a Biofuels Sales Obligation.
14. The proposed Biofuels Sales Obligation, set out in this document, requires identified “firms” to sell a proportion of biofuels each year.

¹ Historically lead has been used as an octane enhancer in New Zealand.

Details about obligation levels, liable firms and associated issues, such as the requirement for fuel quality standards, are set out in this discussion paper. The proposed legislative framework for the Biofuels Sales Obligation is also discussed.

15. In December 2005, the Enabling Biofuels Scope Document, which set out the required policy investigations for the obligation, was prepared. To assist the development and design of the obligation, early in 2006 a consortium of consultants, led by Hale and Twomey, were commissioned to undertake policy investigations regarding the supply, distribution, vehicle risks and economics of bringing biofuels to the market in New Zealand. The design of the obligation draws upon the analysis and conclusions of these reports.
16. The scope document and the following four consultants' reports are available on the Ministry of Transport's website: www.transport.govt.nz:
 - a) Enabling Biofuels Scope Document, 2005
 - b) Enabling Biofuels: Biofuels Supply Options, Hale & Twomey Limited, 2006
 - c) Enabling Biofuels: Biofuels Distribution Options, Hale & Twomey Limited, 2006
 - d) Enabling Biofuels: Risks to vehicles and other engines, Transport Engineering Research New Zealand (TERNZ), 2006
 - e) Enabling Biofuels: Biofuel Economics, Covec, 2006

The timetable for progress

17. Submissions on the proposal and options set out in this document are due to the Ministry of Transport by **Friday 20 October 2006**. Submissions received after this date will not be considered when developing the final policy for the obligation.
18. Submissions will be reported to Cabinet, along with recommendations for the final design details of the obligation before the end of the year.
19. Both the introduction of the obligation and regulations covering biofuel fuel quality require new or amended legal powers. The process of developing legislation will follow decisions on the obligation in late 2006, with the obligation expected to come into force by 2008.

The Proposed Biofuels Sales Obligation

20. We are seeking comment on the design of a Biofuels Sales Obligation (the obligation). Firms selling petrol and diesel will be required to ensure that biofuels make up a proportion of total combined petrol and diesel sales each year. The proposed details are set out below.

Obligation levels and time frames

21. It is proposed that the obligation be set as a percentage of the combined petrol and diesel sales per annum² – measured in petajoules, based on the gross volumetric energy content of each fuel – at the following levels:

	<i>Year 1</i> 2008	<i>Year 2</i> 2009	<i>Year 3</i> 2010	<i>Year 4</i> 2011	<i>Year 5</i> 2012 onward <i>(subject to review)</i>
Percentage of total combined petrol and diesel sales (per annum)	0.25%	0.75%	1.50%	2.25%	2.25%
Estimated obligation in petajoules (based on projected sales) ³	0.5	1.6	3.2	4.9	4.9
Estimated biofuels supply (million litres)	15-22	46-68	92-135	139-202	140-204

22. The biofuel volumes that are supplied under the obligation will vary depending on the relative levels of biodiesel and bioethanol that are supplied to meet the obligation. This is because biodiesel has a higher energy content per litre than bioethanol. The volumes of biofuel required to meet the obligation have been calculated using the standard energy values that are listed in Table 2, which have been taken from the Energy Data File (for petrol and diesel), the US Department of Energy, Energy Efficiency & Renewable Energy, Alternative Fuels Data Centre (for bioethanol), and Mittelbach (for biodiesel)⁴:
23. It is proposed that the values in Table 2 apply as default energy values for the purposes of the obligation, irrespective of the feedstock used to create the biofuel. However, the energy content of biofuels can vary depending on the feedstock used. Therefore it is proposed that a liable firm can use figures that are different from the default energy values for a biofuel sold, provided that the energy values used are independently verified.

² Or other period as set out in legislation. It is expected that the first period for the sales obligation may not be a full year, in that, it might apply between 1 April 2008 and 31 December 2008.

³ Projected level of fuel demand, and associated projected sales levels, provided by the Ministry of Economic Development.

⁴ See <http://www.eere.energy.gov/afdc/>. The energy value for biodiesel is sourced from Mittelbach, M. and Remschmidt, C. *Biodiesel: The Comprehensive Handbook* (2004) which provides an energy value for tallow-based biodiesel.

Table 2: Default Energy Values for the Biofuels Sales Obligation		
Fuel	megajoules per litre	Million litres per petajoule
Premium Petrol	35.3	28.3
Unleaded Petrol	34.9	28.7
Diesel	37.9	26.4
Bioethanol	23.4	42.7
Biodiesel	35.0	28.6

24. Biomass derived fuels other than biodiesel or bioethanol, which can be used as direct full or partial replacement for petrol or diesel, can also be used to meet the obligation on an energy equivalent basis.

Point of obligation and individual liabilities

25. It is proposed that the obligation affect ***firms that first purchase or obtain petrol or diesel from a New Zealand manufacturer (i.e. the New Zealand Refining Company), or import petrol or diesel directly.*** The firms that will currently be liable are BP, Caltex, Gull, Mobil and Shell. The obligation would not apply to other firms that purchase their petrol and diesel from the firms that first purchase or import petrol and diesel
26. The obligation applies to wholesale and retail sales of relevant fuels of the firm during the year, including sales to firms on-selling fuel, plus any petrol and diesel used by the liable firm during the year. Fuel used by the firm during the year would be calculated in accordance with the fuel (petrol and diesel) expenses that are included in that firm's financial statements for the relevant period. Sales volumes of petrol and diesel (and in time biofuels for the purpose of meeting the obligation) can be calculated using the methods currently employed to collect the Petroleum Fuels Monitoring Levy. This levy is payable for each complete litre of petrol or diesel sold for use in New Zealand. In order to calculate a firm's obligation, sales volumes of petrol and diesel would be multiplied by relevant energy values. The obligation applies to all petrol and diesel irrespective of actual use but does not apply to heavy diesel oil.
27. Diesel or petrol sold for export (e.g. to ships on international trips or to supply other countries in the region) would not be included in the calculation. In other words, fuel sales that would be considered zero rated for GST purposes would be excluded.
28. It is proposed that the obligation start on 1 April 2008 and that this first period is not a full calendar year, in that, it would finish on 31 December 2008. The obligation in 2008 would be for 0.25% of combined petrol and diesel sales during this period. Each year thereafter will run between 1 January and 31 December. If the obligation is not able to start on 1 April 2008 because the necessary legislation is not yet in place, it is proposed that the obligation level starts at 0.25% and increases in steps at 12 month intervals as noted in Table 2. If the obligation period (year) does not fall into calendar years, it is proposed that each obligation period

(year end) would fall at the end of a quarter, such that one of those quarters would be the calendar year end. This means it would be in alignment with 4 periods of the Petroleum Fuels Monitoring Levy, which is paid on a quarterly basis.

29. The obligation percentage would be applied to petrol and diesel sales of that year on an energy equivalent basis. The energy equivalent sales of biofuels during the same calendar year would have to make up the obligation percentage. A benefit of an annual obligation is that the obligation would not be affected by seasonal changes in fuel demand or biofuel availability.

Applicable biofuels

30. The obligation can be met with ***any biofuel sold as a direct replacement for petrol or diesel for use in New Zealand, at any blend level***, as long as it meets the following requirements:
 - a) The biofuel is made from a biological feedstock (examples other than biodiesel or bioethanol include renewable diesel manufactured along with petroleum diesel at the refinery, renewable petrol or diesel manufactured from biomass); and
 - b) The biofuel must meet relevant fuel quality standards.
31. While bioethanol and biodiesel will most likely be used to meet the obligation, other biofuels can be used to meet the obligation if they become available. The onus would be on the liable firm to provide independently verified evidence that the fuel is made from biological feedstock. Only the biological component of a blend would count toward meeting the obligation.

Source of biofuels

32. The biofuels used to meet the obligation may be locally manufactured or imported. However, it is proposed that liable firms provide information in their reporting for the obligation on the country of origin of all feedstock and biofuels sold to meet the obligation. This information may be used to determine future policy.

Rollovers, trading and penalties

33. It is proposed that the **obligations in Year 1 and Year 2 (expected to be 2008 and 2009) are able to be rolled over to the following year i.e. year 2 or year 3 respectively**, with a small penalty, a requirement to sell an additional 5% of the total amount of biofuels that should have been sold in the obligation year. No other penalties would apply in these first two years. This recognises that the time between now and the indicative start date of 1 April 2008 is quite tight for the changes necessary to manufacture and/or import biofuels.
34. The **penalty proposed for non compliance is \$60 million per petajoule of biofuels for which a firm is short of their obligation**. It is proposed that

this penalty applies after two years of the implementation of the obligation, which is expected to be from 2010 onward.

35. It is proposed that **liable firms can trade with each other** or any other firm in order to meet the obligation. Trading is considered appropriate because it gives these firms options as to how they meet their obligation while still ensuring that the amount of biofuels being sold in New Zealand each year meets the obligation. Liable firms would be able to trade volumes of biofuel sold between themselves and other firms, provided the biofuels were sold in New Zealand and met relevant quality standards.
36. The onus is on the liable firms to provide independently verified evidence of trades that have taken place to meet the obligation. The annual sales obligation reports of both firms involved would document the details of the trade. Where a trade with a non-liable firm occurs, the liable firm will be required to submit a record of the trade and a record of the biofuel sale by the non-liable firm. The non-liable firm is expected to keep records of the trade and the biofuel sales for the same seven year period as that required of liable firms. It is proposed that the provision of this information between liable firms and non-liable firms is managed through their contractual arrangements.

2010 review of obligation

37. It is proposed that a review of the Biofuels Sales Obligation be carried out two years after it is implemented. It is expected that such review would occur in 2010. The purpose of the review would be to assess the implementation of the obligation and the annual obligation percentage levels, especially those beyond 2012.

Exemption for bioethanol from excise duties

38. The bioethanol exemption from excise duties will be continued between now and 2012. This proposed exemption means that excise duties paid on petrol will not be paid on bioethanol. The Accident Compensation Levy that is paid along with petrol excise is not covered by this exemption.

Details and Questions:

Will there be sufficient biofuels to meet the obligation?

39. The requirement for biofuels sales of 2.25% of total petrol and diesel sales in year 4 and 5 of the obligation, which is expected to be in 2011 and 2012, equates to about 5 petajoules of biofuels. This reflects the quantity of biofuel feedstock currently estimated to be available in New Zealand. There is currently enough tallow from the meat industry to make between 5 and 6 petajoules of biodiesel (140+ million litres). There is also 0.05 to 0.095 petajoules (or 2 – 4 million litres) of bioethanol made from whey potentially available. The obligation level for the 4th and 5th year has therefore been set to approximately 5 petajoules. In addition biofuels can be imported to meet the obligation.
40. Table 3 indicates the expected maximum volumes of biofuel demand over time, taking into consideration the amount of domestic biofuel feedstock available and that the distribution system will slow down and possibly limit the supply of biofuels⁵.

Table 3:
Demand with regard to distribution constraints⁶

Demand	2008	2010	2012
Max Ethanol (mln litres)	17	27	40
Max Biodiesel (mln litres)	36	70	122
Max Biofuel (mln litres)	53	97	162
Max Biofuels (energy in petajoules)	1.7	3.1	5.2

41. The obligation has been set at practical levels taking the supply and distribution situation for biofuels in New Zealand into consideration.

What if biofuels are not available by 2008? – The “rollover”

42. The petroleum and biofuels industry may not have enough time to develop suitable supplies of biofuels by 2008. Investment in biofuel manufacture and supply is lumpy, with large scale capital investment required in initial phases (e.g. constructing production plants, modifying terminals) before any fuel can be supplied. Rather than take a conservative position, the expected start year of 2008 provides an incentive for industry to move quickly.
43. However, to recognise that it may be difficult to supply biofuels in the short-term, it is proposed that the obligations in the first two years, expected to be 2008 and 2009, can be rolled over. A penalty - a requirement to sell an additional 5% of the total amount of biofuels that should have been sold in the obligation year - would apply to encourage early biofuel supply.

⁵ Enabling Biofuels: Biofuels Distribution Options, Hale & Twomey Limited, 2006

⁶ Enabling Biofuels: Biofuels Distribution Options, Hale & Twomey Limited, 2006

Table 4 shows the level of biofuel sales if the roll-over option is used in full (i.e. by all the identified liable firms).

Table 4: <i>Proposed Obligation in the event that rollover is taken advantage of in full</i>					
	Year 1	Year 2	Year 3	Year 4	Year 5
	2008	2009	2010	2011	2012 onward*
Percentage of total combined petrol and diesel sales (per annum) with “roll-over”	0%	0%	2.56%	2.25%	2.25%
Estimated obligation in petajoules (based on projected sales)**	0	0	5.6	4.9	4.9
Equivalent biodiesel (millions of litres)	0	0	159	139	140
Equivalent bioethanol (millions of litres)	0	0	228	202	204

* Subject to review after 2 years of implementation

** Projected level of fuel demand, and associated projected sales levels, provided by the Ministry of Economic Development

How has the proposed penalty for non-compliance been set?

44. The aim of a penalty is to set up a scenario such that failure to comply with the obligation is not cheaper than the cost of bringing biofuels to the market. The penalty could be a fixed amount or it could be indexed to the price of oil. In order to provide investment certainty and to retain simplicity, a fixed penalty is proposed.
45. The appropriate penalty would need to be greater than the maximum expected costs of coming into compliance. Maximum costs would occur if the oil price is low and therefore it is low cost to sell conventional fuel, if the obligation cannot be met using tallow-based bio-diesel and therefore more expensive options are considered or if the tallow price starts to reflect the price of oil.
46. At a low oil price (US\$20 per barrel) the costs of diesel production are as low as 32c per litre. In comparison a high cost of biofuel production may be up to \$1 per litre, giving a cost of compliance of 68c per litre.
47. A common approach to setting a penalty is to multiply such base amount by 3 and in some cases up to 10. Multiplied by 3, a rate of 204c per litre results; when this is converted to petajoules it equates approximately \$60 million per petajoule.

Use of any penalty revenue

48. There is not expected to be any penalty revenue as compliance with the obligation is seen as the least-cost option for liable firms. If any revenue is collected, it is likely to be variable and unpredictable and therefore difficult to tag to a specific activity. Any penalty revenue collected would form a part of general Crown revenue.

What about variable supply: over supply one year and under supply another?

49. Firms required to meet the obligation might want to use an oversupply of biofuels to meet all or some of a future year's obligation. This provision is known as "banking". It gives firms options in respect of how they meet the obligation, but it may result in less biofuels being available when the price of oil is low. This situation would undermine the market impact of the obligation which gives a guarantee to investors for a minimum level of demand regardless of oil price movements.
50. Requiring the obligation to be met over a twelve month period should help with variations in biofuel supply availability and cost.
51. It is acknowledged that there may be some situations that arise that may make it difficult to supply the exact amount of biofuels required to meet the obligation, due to minor supply disruptions or similar. **Limited banking is proposed** to cover such situations. This would allow for a small amount of oversupply of biofuels in some years and undersupply in others; it is proposed to be **capped at 5%** of the annual obligation.

Can imported biofuels be used to meet the obligation?

52. **Yes.** It is proposed that there are no limitations on whether biofuels are imported or on the country of origin of biofuels or biofuel feedstock.
53. For monitoring purposes, it is proposed that the type and country of origin of imported biofuels and feedstocks is stated in the firm's annual reports on the obligation.

Does it matter what the end use of the biofuels is?

54. **No.** The obligation does not require biofuels to be sold for any particular use, provided they are a direct substitute for petrol and diesel. While the obligation is aimed at the reduction of petroleum fuels used in transport, it is acknowledged that not all petrol and diesel (or any biofuel that is blended with petrol or diesel or that replaces petrol or diesel) will necessarily be used in transport. The only exception is that fuel exported or taken off shore is not included.

Can the energy used by hydrogen powered vehicles or electric or hybrid cars be used to meet the obligation?

55. **No.** The obligation does not apply to these technologies because at this stage it is more difficult to prove that the hydrogen or electricity is from a renewable energy source and their inclusion would make the obligation more difficult to administer. It is acknowledged however that they do replace vehicles that would otherwise use petrol and diesel.
56. To the extent that these technologies are renewable (hydrogen and electricity can come from non-renewable sources), the fit of the obligation with policy for these vehicles and fuels should be considered when the obligation is reviewed after the first two years of implementation.

Is there any incentive for meeting the obligation early?

57. No. However, it is proposed that any biofuels that are supplied following the enactment of the legislation but before the start date of the obligation can be counted toward the obligation in the first year. This would appropriately reward liable firms for the early sale of biofuels.
58. It might also be desirable to encourage the supply of biofuels in the first two years of the obligation, given that the ability to roll-over the obligation for the first 2 years (expected to be until 2010) may slow down the introduction of biofuels to market. There is a small penalty if a liable firm takes advantage of the roll-over provisions (a requirement to supply 5% more in the following year).
59. Additional incentives for early biofuels supply, through financial payments or the ability to “bank” supply to meet later obligations are not proposed. The length of the obligation and the level of the penalty for non-compliance is expected to provide sufficient incentives for liable firms to roll-out biofuels as early as practicable.

Energy equivalent versus litres or tonnes

60. The energy value of fuels (measured in petajoules) is used because it is a way of measuring and totalling fuels with different characteristics and it reflects the usefulness of a fuel. It is recognised that the public tends to measure fuels in litres, the industry uses tonnes and government tends to use petajoules when setting renewable energy targets (e.g. NEECS).
61. It is proposed that the default figures set out in Table 2 be used for the energy values of the various petrol grades, diesel, and biofuels. If a liable firm wishes to use different values from the default energy values or to establish an energy value for a fuel for which a default energy value is not available, the firm must provide independently verified evidence of the fuel's energy value for reporting purposes. The energy value for petrol and diesel will be set by the government and will be the same for all liable firms.

Are there any inadvertent competitive effects of the obligation being at different levels?

62. The proposed obligation could be met solely with biodiesel. This might result in an advantage to firms with a higher market share of diesel relative to petrol.
63. If the obligation was set at higher levels, all affected firms would then be required to supply both bioethanol and biodiesel. Such a scenario would limit potential advantages for firms with a higher market share in diesel and could positively impact decisions regarding bioethanol distribution infrastructure. But, an obligation requiring sales of bioethanol would also put early, and arguably inappropriate, pressure on supply and delivery issues. For example, service stations are required to have double skinned tanks for holding petrol containing 1% or more bioethanol. Only 22% of service stations currently have such tanks, which represents 29% of petrol sold by volume.
64. The ability to trade the obligation and have limited banking of biofuels sales provides flexibility for firms. The marginal impact on all the affected firms is the same; all firms are required to purchase additional litres of biofuel for every litre of petrol or diesel sold.

Who would administer the obligation?

65. The Ministry of Economic Development or the Ministry of Transport are the most likely agencies to take on responsibility for the administration of the obligation.
66. Factors that will be considered when deciding on an appropriate agency for the administration of the obligation include: fit with activities and responsibilities, existing stakeholder relationships, fit of existing legislative framework and complimentary policy responsibility.

Reporting, auditing and verification

67. It is proposed that liable firms submit *independently audited reports* to the administering agency within three months of the end of each obligation period (e.g. in the case of calendar years by end March). The information required in these reports would be set out in legislation or regulation. Please refer to the appendix for a list of information that could be required.
68. Firms would be expected to maintain adequate records e.g. receipts of biofuels sales and purchases, and through the records to be able to prove that the information contained in the report was true and correct, similar to financial reporting. The records would be required to be kept for seven years. It is expected that liable firms would manage the accessing of third party records relating to physical biofuels sales and trades through contractual arrangements with the third parties.
69. It is also proposed that the government be provided with the legal ability to verify the information contained in annual reports or information that is

directly related to the obligation even if not included in the annual report. This provision would enable monitoring and verification of compliance with the obligation and, where required, support action taken to collect penalties for non-compliance.

70. The administration agency will put the appropriate systems in place to ensure that any confidential information that is supplied for the obligation reporting requirements will be treated appropriately.

How will the obligation affect fuel prices for consumers?

71. There is considerable uncertainty and debate about future oil prices, and accordingly it is difficult to predict how an obligation to sell biofuels will influence the price of fuels at the pump. Analysis indicates that biodiesel made from New Zealand tallow provides net economic benefits for New Zealand, as biodiesel should be competitive with diesel at oil prices from US\$45-50 per barrel⁷.
72. However, it is acknowledged that as a result of the obligation, prices of fuels used for transport could increase (i.e. petrol, diesel, biofuel blends and possibly others). One possible scenario is that if the biofuel supply market in New Zealand is not competitive a biofuel producer may be able to charge import parity prices, which are likely to be higher than marginal production costs. Such a scenario may lead to higher pump prices.
73. There is a risk that biofuels prices and their feedstocks may start to link to the price of oil. If biofuels are used widely internationally as substitutes for petroleum-based fuels then changes in oil prices might enable biofuel suppliers to change their prices to reflect the change in the value of their product. The same would apply to suppliers of the feedstocks (such as tallow) if biofuel production became a significant use. If such price relationships develop between feedstocks, biofuels and oil, then the economic benefits of using biofuels during periods of high oil prices would be decreased.
74. It is difficult to quantify the likelihood of these different scenarios arising and the potential price increases that could occur. These scenarios are not seen as likely enough to overturn the desirability of the obligation.

⁷ Enabling Biofuels: Biofuel Economics, Covec, 2006

Are any other financial incentives being proposed alongside the obligation?

75. No financial incentives are being proposed at present except for the continuation of the exemption from excise duty until 2012 currently enjoyed by bioethanol.
76. World trends in biofuels policy are moving toward biofuel obligations. Examples include the UK Renewable Transport Fuel Obligation and Brazil's mandate for between 20 and 25% bioethanol to be blended with all petrol. Historically, and especially for initial periods of market development, subsidies and waivers from government charges have been utilised by countries that have biofuels commercially available. In these cases reasons for promoting biofuels have focussed on boosting agricultural industries and to some extent on security of supply. In New Zealand the policy goals are environmentally focused, and a market based, least cost approach is desirable.

No financial incentive for biodiesel

77. Biodiesel currently enjoys no financial advantage over petroleum diesel with respect to government taxes or charges. The sale of biodiesel would be currently more economic than the sale of petroleum diesel under reasonable assumptions regarding future oil and feedstock prices. Therefore, there may not be sufficient justification to provide a financial advantage for biodiesel at present.
78. However, the current economic picture may change, particularly the price of biodiesel feedstock such as tallow due to increasing demand from the international biofuels industry and the effect on international markets. Therefore, while the possibility of providing a financial incentive for biodiesel is not part of the proposals surrounding the sales obligation, comments are sought on this as an option in addition to the proposals contained in this discussion document.

Why not have separate obligations for bioethanol and biodiesel?

79. An alternative to the proposed obligation would be setting separate sales obligations for bioethanol and biodiesel - i.e. a sales obligation for bioethanol and a sales obligation for biodiesel.
80. The advantage of such an approach is that there is a guarantee that biodiesel and bioethanol and the supporting infrastructure for both fuels will be present in New Zealand between now and 2012.
81. The disadvantages include that:
 - a) This is unlikely to lead to the lowest economic cost for the development of a biofuels industry in New Zealand. A 'biofuels sales obligation' gives full flexibility to liable firms to choose which biofuels they will commercialise, and which biofuels they might choose to trade with another firm. In the 'biofuels sales obligation' setting, the

lowest cost biofuel will be used first which may be bioethanol or biodiesel depending on the firm, i.e. firms who have access to infrastructure that is suitable to bioethanol may be able to supply bioethanol in the short or medium-term, and companies with good access to potential biodiesel producer(s) and who can supply larger volumes of biodiesel to the market (to make use of the more voluminous supply of tallow) will more readily be able to supply biodiesel in the short or medium-term. With the proposed obligation, one firm with surplus bioethanol or biodiesel could sell either to another firm to assist them in meeting their obligation. With separate sales obligations for biodiesel or bioethanol, trading options are more restricted and therefore potentially more expensive.

- b) There is no incentive for other innovative biofuel options that might come onto the market between now and 2012, such as renewable diesel made at the refinery (as is expected to start in Australia in 2007).
- c) A requirement to sell a certain amount of bioethanol may put pressure on firms to sell more bioethanol than they are comfortable with considering the infrastructure limitations for some firms, limitations presented by the New Zealand fleet (particularly second hand Japanese cars that some drivers may not be willing to use bioethanol-petrol blends above 3 or 5%), and feedstock limitations in New Zealand at present (whey from the dairy industry to make low volumes of bioethanol).

Are biofuels of net national benefit to New Zealand?

- 82. The replacement of petroleum diesel with biodiesel is expected to bring net national benefits to New Zealand between 2008 and 2012 when domestically available tallow is used as the feedstock⁸.
- 83. The replacement of petrol with bioethanol is not expected to produce net national benefits for New Zealand between 2008 and 2012⁹. However, there may be some circumstances where a niche supply of bioethanol may be an economic venture, such as the supply of E5 or E10 petrol at a few petrol stations. This may arise if whey is used as the feedstock and/or when a firm has distribution and storage facilities that are compatible with bioethanol-petrol blends. The proposed obligation is set up in such a way that these scenarios are not prevented from taking place.

⁸ For more details refer to the report: Enabling Biofuels: Biofuel Economics, Covec, 2006.

⁹ For more details refer to the report: Enabling Biofuels: Biofuel Economics, Covec, 2006.

What are the expected administration and compliance costs?

84. Administration costs for government are expected to be small. It is estimated that one additional full time equivalent employee might be required; assistance from existing communications, technical and legal teams are also likely to be required. Additional funding to provide for communications campaigns and any independent legal counsel may be appropriate, as well as to boost government-operated fuel quality monitoring.
85. Compliance costs for liable firms are expected to be small. Proposed reporting requirements are annual and are in alignment with other information that is already provided to government.

What are the capital costs associated with meeting the obligation?

86. The estimated capital costs to private enterprise associated with meeting the obligation in full between 2008 and 2012 for biodiesel range between \$60 and \$106 million, and for bioethanol between \$105 and \$190 million. In combination, where biodiesel and bioethanol plants are both built, the total capital costs for the industry could be in the order of \$125 million.

What about the Kyoto Protocol?

87. If the sales obligation, as proposed, is met in full between 1 January 2008 and 31 December 2012, between 0.972 and 1.027 million tonnes¹⁰ of CO₂ emissions will not need to be accounted for under the Kyoto Protocol¹¹ due to the replacement of petroleum petrol and/or diesel by biofuels. At a carbon price¹² of \$9.64 per tonne CO₂, this represents between \$9.4 million and \$9.9 million that would be saved by the government in respect of its Kyoto Protocol commitments. This calculation does not take fuels used in manufacturing or transport of petroleum or biofuels into consideration.

¹⁰ The bottom of the range is a scenario where the sales obligation is met in full with bioethanol, the top of the range represents a scenario where the sales obligation is met in full with biodiesel. In practice the actual CO₂ saved is expected to fall somewhere in between.

¹¹ For more information about the Kyoto Protocol visit the government's climate change website: www.climatechange.govt.nz.

¹² Budget 2006 price of carbon US\$6 multiplied by the average US/NZ exchange rate over the past month of 1.60634. The price of carbon as reported in Budget 2006 is under review by the government. An updated price of carbon is expected to be announced in late September 2006.

Questions on the obligation

1. Are the obligation levels, described as percentages, achievable?
2. Is the timing and rate of change of the obligation, when it starts and how fast the levels change, appropriate?
3. Do you agree that the obligation gets calculated based on petrol and diesel sales of year x and biofuel sales of year x must meet the obligation? Or, would it be better if the obligation was calculated based on petrol and diesel sales of the previous year i.e. year x-1.
4. Does the possibility of using calendar years cause any problems?
5. Do you agree with the proposal to allow rollover with minimal penalties for the first two years (2008 and 2009)?
6. Do you agree with the proposal to allow trading of the biofuels obligation?
7. Do you agree that limited banking be included in the proposed approach?
8. Is the penalty rate of \$60 per petajoule for non-compliance after the first two years of implementation (likely to be from 2010) appropriate? If not, please make a recommendation.
9. What do you think about the suggestion that, in addition to a financial penalty for non-compliance, that any shortfall in meeting the obligation in a particular year (compliance period) is added to the level of obligation the following year (compliance period)?
10. Are the proposed default energy values for various grades of petrol, diesel, bioethanol and biodiesel appropriate? Do you agree with the regime for default energy values and that other values can be used if independently verified?
11. Do you think the reporting, audit and verification regime is practical and appropriate? In particular, do you think more frequent reporting such as quarterly would be more appropriate?
12. What do you think about the possibility of providing a financial incentive (subsidy) for biodiesel? While present market conditions do not readily provide justification for such an incentive are there conditions that might make an incentive more appropriate?
13. What do you think about the possibility of having a separate sales obligation for bioethanol and for biodiesel, rather than the proposed 'biofuels sales obligation'?

Biofuel Quality Regulation, Monitoring and Information Disclosure

88. The current legislative regime for regulating and monitoring fuel quality was developed when petroleum based fuels were the norm. In order for the quality of biofuel and biofuel-petroleum blends to be appropriately regulated, legislation needs to be updated. It is proposed that the same legal powers that apply to petroleum fuel regulation and monitoring also apply to biofuel and biofuel-petroleum blends.
89. Related issues can also be provided for in legislation at the same time. These include the regulation of fuel dispensing equipment and requirements to provide information on the price and distribution of biofuels.

Fuel specifications

90. The quality of petrol and diesel is controlled by the Petroleum Products Specifications Regulations 2002 (PPSR). The PPSR set out minimum standards affecting the performance of fuel, enabling consumers to purchase petrol and diesel to a quality standard appropriate for New Zealand's vehicle fleet and climatic conditions.
91. The PPSR distinguishes between "fuel sold by retail" and "all fuel". The complete list of PPSR specifications apply to fuel sold by retailers, whereas only the environmental specifications apply to all fuel. This allows the supply of alternative specification fuel to end users who have written supply agreements or contracts whilst protecting the interests of retail consumers. The penalty for non-compliance with the PPSR is up to \$10,000.
92. The PPSR currently allows for up to 10% bioethanol content in petrol but does not give any specifications for bioethanol quality. The Energy Efficiency and Conservation Authority (EECA) has set up a voluntary bioethanol specification, which provides that:
 - a) The bioethanol must be of biological, not petroleum origin;
 - b) The bioethanol must meet the requirements of American Society for Testing and Materials standard ASTM D4806-01, with the exception that the bioethanol must be denatured by the addition of at least 1% regular or premium petrol (as required by the New Zealand Customs Service), with the added petrol meeting the PPSR;
 - c) Corrosion inhibitor must be added such that the resulting bioethanol-petrol blend has comparable corrosion properties to the base petrol; and
 - d) The bioethanol-petrol blend must meet the requirements of the PPSR.

93. The PPSR does not specifically provide for biodiesel. A New Zealand biodiesel standard entitled Automotive Biodiesel – Specification for manufacture and blending (NZS 7500:2005) came into being in 2005. This standard provides specifications for biodiesel manufacture (i.e. a pure biodiesel or B100 specification). It also provides a blending specification that allows for up to a 5% biodiesel-diesel blend for retail sale, and requires that retail blends meet the diesel specification in the PPSR. The standard also specifies some allowable properties for non-retail biodiesel-diesel blends.
94. It is proposed that:
- a) The new (or amended) legislative framework utilise the current New Zealand Biodiesel Standard NZS 7500:2005 and the EECA voluntary standard for bioethanol as the basis for development of fuel quality specifications for biodiesel and bioethanol, respectively.
 - b) The current penalty for non-compliance with petrol and diesel fuel specifications also applies to biofuels and biofuel blends.

Monitoring fuel quality

95. The quality of retail petrol and diesel is monitored by the Energy Safety Service. This service is funded by the Petroleum Fuels Monitoring Levy (PFML) of 0.025 cents per litre of petrol and diesel sold. The PFML is also used to meet some of the costs associated with reporting to the International Energy Agency.
96. Because biofuel quality will be regulated under the PPSR (or its equivalent) it is appropriate that biofuel quality is monitored for compliance. This will require additional tests for biofuels, adding some cost and complexity to the fuel quality monitoring programme. Biofuel sales will also be regularly reported to the International Energy Agency. Because these functions are currently funded by the PFML, it is proposed that the sale of biofuels are also subject to the PFML.
97. It is proposed that:
- a) Biofuel sales be subject to the PFML, which might be renamed to reflect its wider scope.
98. In practical terms, the government's Fuel Quality Monitoring Programme which tests and monitors retail sales of petrol and diesel will need to be adapted for bioethanol-petrol blends and biodiesel-diesel blends. It will also need to monitor compliance with any waivers to the PPSR that may arise for retail biofuel blends and maximum allowable retail biofuel content.
99. In addition, limited monitoring may be needed in some cases to assess whether petroleum and biofuel components comply with the specifications for neat petroleum products and/or biofuels. The government expects that pre-blend monitoring would be undertaken by

oil companies and biofuel suppliers in order to ensure biofuel and petroleum quality prior to blending.

100. It is proposed that:

- a) The present Fuel Quality Monitoring Programme's retail point of sale testing and monitoring for petrol and diesel be adapted for bioethanol-petrol blends and biodiesel-diesel blends;
- b) Legislation be extended to provide the ability to ask liable firms and biofuel suppliers to report on the fuel quality of their blend components (petrol, diesel, biodiesel, bioethanol), to prove compliance when and if required; and
- c) Legislation be extended to provide the ability to take samples from storage tanks (terminals, refinery, biofuel storage facilities and plants) on a random basis.

Consumer information

101. Current legislation requires suppliers of fuel to provide information to consumers on the price, quality, quantity and nature of fuels. This is restricted to "refined petroleum products" and therefore does not include biofuels.

102. There is increased risk for the use of low level bioethanol-petrol blends in marine or aviation applications. This is because in the presence of water, bioethanol can separate out of the fuel into a bioethanol water layer which could cause an engine to stop. Marine use increases the risk of the presence of water in the fuel tank, and in aviation use, cold temperatures at altitude can result in easier bioethanol separation with any water from the air condensed in the fuel tank. It is recommended that all bioethanol-petrol blends are labelled and relevant information is provided to consumers.

103. It is proposed that:

- a) Legislation is extended to provide the ability to require suppliers of biofuels, including biofuel blends, to display or provide information to consumers on price, quality, quantity and nature of biofuel.

Provision of information to government

104. Information is currently collected for the purposes of fulfilling domestic and international reporting obligations, levy collection, forecasting and security of supply monitoring. It is important to be able to collect the equivalent information on biofuels.

105. Current arrangements limit information sought on the refining of petroleum products to the price of the petroleum or the product. This limit may not be appropriate for biofuels because additional information may be required on new biofuels technologies, in order to determine whether the fuel qualifies for the obligation and to what extent it would

qualify (i.e. is the fuel made of biological feedstock and in what proportion).

106. It is proposed that:

- a) The Minister of Energy's ability to require information to be provided on petroleum and refined petroleum products be extended to include biofuels.
- b) The government explores, with affected firms, ways to increase/alter information requirements in respect of biofuels while minimising costs of reporting both on the obligation and information sought by the Minister.

Specifications for fuel dispensing equipment and fuel tank inlets

107. Current legislation allows some control over fuel dispensing equipment and fuel tank inlets on motor vehicles. To date this control has not been utilised.

108. New regulations may be required to handle the diversification of the fuel market in New Zealand. Examples may include requiring the use of certain types of vapour capture systems on dispensing equipment or standards on fuel tank inlets to prevent vehicles being accidentally filled with the wrong fuel. In the event that a fuel made up of more than 10% bioethanol (such a 85% bioethanol-petrol blend) becomes available, it is likely to only be suitable for a small number of vehicles initially, and could require extra safeguards to prevent the fuel being used in incompatible vehicles. In particular, clear information about the use of bioethanol-petrol blends in marine vessels may need to be provided.

109. It is proposed that:

- a) The ability to regulate fuel dispensing equipment and fuel tank inlets be widened to include circumstances where control would be appropriate for dispensing biofuels and biofuel blends.

Questions – Biofuel Quality Regulation, Monitoring and Information Disclosure

1. Should government have the ability to ask liable firms and biofuel suppliers to report on the fuel quality of their blend components (petrol, diesel, biodiesel, bioethanol), to prove compliance when and if required?
2. Should the government have the ability to take samples from storage tanks (terminals, refinery, biofuel storage facilities and plants) on a random basis (e.g. in the event that retail fuel is non-compliant)?
3. Do you agree that the Petroleum Fuels Monitoring Levy should also apply to biofuels?
4. Do you consider that existing penalties for non-compliance with fuel specifications provide sufficient deterrence?
5. Beyond labelling at retail dispensing pumps, do you think that further consumer information is necessary for biofuels and biofuel blends? If so, please explain.

Technical Issues with Blending, Distributing and Labelling Biofuels

Bioethanol

110. There are some distributional issues for bioethanol and bioethanol-petrol blends because bioethanol, unlike petrol, mixes with water and bioethanol blended with petrol will normally cause the blend to no longer meet the PPSR specifications.
111. Bioethanol's affinity to water has implications for the infrastructure requirements for bioethanol-petrol blends. In general, bioethanol-petrol blends cannot use the same infrastructure that neat petrol uses. Therefore, it is expected that bioethanol will be blended with petrol near the end of the supply chain, i.e. directly into tank trucks at terminals. This practise is common in most countries selling bioethanol-petrol blends.
112. Service stations are required to store bioethanol-petrol blends in double containment tanks. A present, about 29% of petrol is sold out of double containment tanks. Service stations are gradually replacing old tanks with double containment tanks under normal business practices, but it would not be cost effective to replace a tank or indeed a large number of tanks just to accommodate bioethanol-petrol blends. This means that bioethanol-petrol blend sales will be restricted by the number and location of double containment tanks at any point in time. Under normal business practices, it is expected that by 2020 100% of retail service stations will have double containment storage tanks.
113. Because of changes required to blend and distribute bioethanol-petrol blends, a national supply is not expected in the short-term. The obligation has been designed such that it can be met without the supply of a large volume of bioethanol.
114. Bioethanol blended with petrol will normally cause the blend to exceed the PPSR petrol specifications for 'Vapour Pressure', the 'percentage volume evaporated at 70 degrees' limits and the Flexible Volatility Index. Meeting the 'percentage volume evaporated at 100 degrees' limits may also be an issue. The Vapour Pressure limit has predominantly environmental implications (air quality) and the Flexible Volatility Index and the percentage volume evaporated limits have vehicle operability implications.
115. It is proposed that:
 - a) Further technical investigation into the appropriateness and level of any waivers to the PPSR for retail bioethanol-petrol blends is required. The purpose of this technical investigation is to ensure that any waived limits for retail bioethanol-petrol blends do not pose vehicle operability problems and that retail ethanol blends are 'fit for

common purposes¹³. The results of this technical investigation and a preferred position in respect of potential waivers from the PPSR will be released for discussion in October 2006.

Question – Technical issues with bioethanol:

1. Are there any other technical and distribution issues in relation to bioethanol-petrol blends that have not been identified?

Labelling of bioethanol-petrol blends

116. Labelling practices for bioethanol-petrol blends are not consistent internationally. European countries do not require labelling for 5% or less bioethanol-petrol blends. This approach is very unlikely to result in problems for road vehicles and utility engines (based on their experience). But it might allow bioethanol-petrol blends to be used inadvertently for aviation purposes, which has safety implications.
117. In the United States, there are no Federal requirements and labelling is left to the individual states. A number of the states have now removed the labelling requirement for blends up to 10% on the basis that all vehicles can use this fuel. 85% bioethanol-petrol blends do have to be labelled. Australia requires labelling for all blends containing more than 1% bioethanol although the Australian Governments Biofuels Taskforce recommended in August 2005 that the labelling requirement could be removed for blends of 5% bioethanol or less.
118. A conservative approach may be appropriate in New Zealand simply because of how new these fuels are to New Zealand.
119. The EECA voluntary biofuels standard incorporates a label that is designed for use prior to the biofuels obligation. This label is designed to let consumers know that a biofuel blend carrying the label meets voluntary specifications. This label could continue to be used after the introduction of the obligation and regulated specifications for biofuel blends, or the design of the label could be left to individual biofuel blend retailers.



¹³ The PPSR requires that fuel sold for retail is 'fit for common purposes'

120. It is proposed that:

- a) All petrol containing more than 1% bioethanol should be labelled. The label should identify the upper level of bioethanol content, e.g. "this fuel contains up to 5% bioethanol" or some similar wording. The decision on whether to offer 3%, 5% or 10% blends is up to fuel suppliers. Any label should match the intended blend.
- b) No petrol or diesel blend containing less than 1% biofuel may be labelled or promoted as "containing biofuels" or as a biofuel blend.
- c) Biofuel blend retailers have the option to continue to use the EECA biofuel label once the obligation is in place.

Question – Labelling of bioethanol

1. What is your preferred option for bioethanol labelling requirements? Please provide reasons to support your preferred option.

Biodiesel

121. There are few distributional issues with biodiesel. It can generally use the same infrastructure as petroleum diesel which gives it the option of being blended well up the supply chain if desired¹⁴.
122. The most significant biodiesel characteristic affecting its distribution is the cold flow properties (tendency to thicken and in vehicles can plug fuel filters and lines, in colder temperatures) of biodiesel, particularly tallow based biodiesel, are not as good as those of petroleum diesel. This means that storage of biodiesel in its pure form and when blending may require additional heating.
123. Most international experience is with biodiesel made from rapeseed or soybean which has better cold flow properties than biodiesel made from tallow. It is expected that the New Zealand oil industry will be relatively cautious with the introduction of biofuels blends, including 5% biodiesel-diesel blends until they are confident there are no adverse affects when used by consumers.
124. Another potential issue is the density specification for diesel. Biodiesel is typically more dense than petroleum diesel and when blended with diesel the resultant blend can exceed the density limits as set out in the PPSR.
125. Because the production of a biodiesel blend requires the use of diesel and biodiesel, the specifications for both components and the final blend are relevant. The New Zealand Standard for the specification for manufacture and blending of Automotive Biodiesel NZS 7500:2005 requires 5% biodiesel-diesel blends to be comprised of biodiesel which

¹⁴ However, it is not recommended industry practice to use the same pipeline for biodiesel as that used for jet fuel. This will impact the use of the pipeline between the New Zealand Refining Company at Marsden Point and Wiri in Auckland to transport biodiesel.

meets the specification for biodiesel manufacture, and for the 5% biodiesel-diesel blend to conform to the 'Specifications for 5% biodiesel-diesel blends for retail sale', which is the same as the retail diesel specification in the PPSR.

126. The cold property specification and the maximum density specification for 5% biodiesel-diesel blends could be managed by:

- a) Blending at the New Zealand Refinery such that the blended product meets the PPSR¹⁵.
- b) The purchase (import) of a special blend of diesel basestock, so that when blended with biodiesel, the blended product meets the PPSR.
- c) Allowing a waiver for the density (and possibly cold flow) specifications of the PPSR for biodiesel-diesel blends.

127. It is proposed that:

- a) Further technical investigation into the appropriateness and level of waivers from the PPSR retail diesel specifications takes place. The purpose of this investigation is to ensure that any waived limits for retail biodiesel-diesel blends are satisfactory for vehicle operability and that retail biodiesel-diesel blends are 'fit for common purposes'. The results of this technical investigation and a preferred position will be released for discussion in October.

Question – Technical issues with biodiesel:

1. Are there distributional or technical issues for biodiesel and biodiesel-diesel blends that have not been identified?

Labelling of retail biodiesel-diesel blends

128. There are two options considered for the labelling of retail biodiesel-diesel blends in New Zealand, the first being that there is no requirement for retail blends up to 5% biodiesel to be labelled. The second requires all retail blends containing more than 1% biodiesel to be labelled.

129. No requirement to label blends of up to 5% biodiesel has advantages for the industry because it provides flexibility if there are biodiesel supply disruptions. This approach would be consistent with NZS 7500:2005 which limits retail blends to 5% and has no labelling requirement. NZS 7500:2005 allows blends up to 100% for non-retail use and it contains a suggested label in Appendix C of NZS 7500:2005 that can be used for labelling of non-retail sales of biodiesel-diesel blends greater than 5% if there is a need.

¹⁵ Distribution from the New Zealand Refinery may be difficult. Refer to footnote 14.

130. There is not expected to be any risk to vehicles using 5% biodiesel-diesel blend levels when the blend meets the NZS 7500:2005. 5% biodiesel-diesel blends have been used quite extensively in Europe and there is no evidence of any problems. In the United States 20% biodiesel is the most popular blend. Labelling of biodiesel-diesel blends in New Zealand is more about consumer choice and consumer information, rather than managing risk.
131. A conservative approach may be appropriate in New Zealand simply because of how new these fuels are to New Zealand and the possibility of variable supply.
132. It is proposed that:
- a) Retail biodiesel-diesel blends are labelled – any supply that contains biodiesel between 1% up to the retail allowable 5% limit. To allow for blend level variation at the retail site, the label could read “*This fuel contains up to 5% biodiesel*”. Such a label is consistent with the format of the label recommended for higher biodiesel content blends in NZS 7500:2005, or
 - b) Retail biodiesel-diesel blends of 5% or less are not required to be labelled. This is consistent with NZS 7500:2005.
 - c) No petrol or diesel blend containing less than 1% biofuel may be labelled or promoted as “containing biofuels”.

Question – Labelling of biodiesel

1. What is your preferred option for biodiesel labelling requirements? Please provide reasons to support your preferred option.

Management of Vehicle Risks

133. The introduction of biofuels into the New Zealand market raises the issue of potential risks to New Zealand's vehicle fleet. Both biodiesel and bioethanol can potentially cause issues with vehicles; however, at appropriate blend levels there are negligible risks for vehicles and engines. New Zealand has a relatively large proportion of imported used Japanese vehicles and Japan's views on the use of biofuel blends are quite conservative relative to other countries (e.g. they only approve and use bioethanol-petrol blends of up to 3%). This means it is important to be aware of the range of views and experience of biofuel blends in vehicles. See the report 'Enabling Biofuels: Risks to vehicles and other engines' by Transport Engineering Research New Zealand (TERNZ) for more details.
134. There are three main parties involved in the vehicle risk scenario: the vehicle owners, the vehicle suppliers and the fuel suppliers.
135. For vehicle owners, there is a risk that a particular biofuel is not compatible, resulting in impairment of vehicle performance or vehicle wear that is related to biofuels. This risk could be reduced by choosing to:
- a) Use biofuels only when the manufacturer endorses their use in the particular model of vehicle in question; or, alternatively, where there is low perceived risk of incompatibility as determined by some other authority;
 - b) Only use biofuels that meet a recognised standard of quality, for example a fuel with the EECA label;
 - c) Check their vehicle before first use with biofuels; and/or
 - d) Be vigilant of differences in vehicle performance, or other signs of potential trouble, during the first use of biofuels.
136. For vehicle suppliers, there is a risk that they would be held accountable or lose future custom should vehicle wear occur. This risk could be avoided, or at least reduced, by choosing to:
- a) To provide a list of vehicles for which the use of biofuels is endorsed; and
 - b) Make new models compatible with the use of biofuels;

137. For fuel suppliers (who are the liable firms under the obligation), there is a risk that they would be held accountable or lose future custom should vehicle wear occur that is related to biofuels. This risk could be reduced by choosing to:

- a) Provide information to vehicle owners – which models of vehicles are endorsed by their manufacturer, what vehicle checks to make before first use and what checks to make during first use;
- b) Provide fuels that comply with the quality specifications.

138. The following key support mechanisms have been identified to aid the transition to the use of biofuels:

- a) Making information available to vehicle owners. Suggestions include:
 - i. a list of manufacturer-endorsed vehicles;
 - ii. an authoritative risk assessment for other vehicle models (including consideration of retrofit options — for example, replacement of fuel hoses and seals if this is recommended);
 - iii. recommended checks for pre- and first-use of biofuels in a vehicle;
 - iv. recommended practices where these are different to those for the use of fossil fuels — for example, avoiding storing the fuel for periods longer than six months;
 - v. education of the vehicle industry (vehicle suppliers, vehicle technicians, fuel suppliers, etc) so that they can support the public in their quest for information;
- b) Providing minimum specifications for the quality of biofuels at the point of sale.

139. Through this approach, vehicle risks are considered manageable in the context of the proposed obligation. It is proposed that work with the relevant organisations to facilitate the provision of the appropriate support mechanisms be undertaken.

Question – Management of vehicle risks

1. Can you identify any other ways of managing potential vehicle risks?

Glossary

Basestock: A term used in this report to define petrol or diesel that has tighter specification limits than standard petrol or diesel to allow biofuels to be blended without exceeding the Petroleum Product Specification Regulations.

Biodiesel: The methyl or ethyl ester made from vegetable oils or animal fats (i.e. tallow); most commonly blended with diesel for use in compression-ignition (diesel) engines.

Bioethanol: Ethyl alcohol produced by the fermentation and distillation of sugars and starches. It is most commonly blended with petrol for use in vehicles with spark ignition (petrol) engines

Biofuels: Biofuels are fuels that are derived from biomass (recently living organisms such as wood) or their metabolic by-products, such as manure from cows. They are a renewable energy source, unlike other natural resources such as petroleum, coal and nuclear fuels. For the purposes of the Biofuels Sales Obligation (the obligation), the term biofuels refers to those biofuels which are used as a direct replacement for petrol or diesel in petrol or diesel engines.

Biomass: The biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste.

Bxx: A blend of xx% biodiesel in diesel, i.e. B5 contains 5% biodiesel, 95% petroleum diesel.

Cold Filter Plugging Point: Cold Filter Plugging Point is an indicator of the temperature at which the precipitation of wax crystals in distillate fuel may lead to blocking or plugging of equipment filters and fuel lines.

Cloud Point: Cloud point defines the temperature at which a clear diesel fuel becomes hazy or cloudy due to the formation of wax crystals.

Diesel: Diesel means a refined petroleum distillate having a viscosity and distillation range that is intermediate between those of kerosene and light lubricating oil, whether or not it contains additives, and that is intended for use as fuel in internal combustion engines ignited by compression (from the Petroleum Products Specification Regulations 2002)

EECA: The Energy Efficiency and Conservation Authority

Exx: A blend of xx% bioethanol in petrol, i.e. E3 contains 3% bioethanol and 97% petrol.

Percentage volume evaporated at 70 degrees limit and percentage volume evaporated at 100 degrees limit: The percentage volume evaporated at 70 degrees limit and percentage volume evaporated at 100 degrees limit are measures of how much petrol has evaporated at 70°C and 100°C respectively. The petroleum specifications set lower and upper limits to ensure good starting and engine performance when warm.

Fuel Quality Monitoring Programme (FQMP): The fuel quality monitoring programme is the responsibility of the Energy Safety Service, a group within the Ministry of Economic Development. It routinely tests petrol and diesel samples from around the country to ensure that the fuel available to consumers complies with the regulations.

IEA: International Energy Agency. This agency acts as energy policy advisor for its 26 member countries in their effort to ensure reliable, affordable and clean energy for their citizens.

NEECS: National Energy Efficiency and Conservation Strategy; this sets the agenda for government programmes to promote greater energy efficiency, energy conservation and the use of renewable energy across the economy. It was released by on 27 September 2001 but it currently under review, to be replaced in 2007.

NZRC: New Zealand Refining Company or the New Zealand Refinery

NZS 7500:2005: The New Zealand Standard on Automotive Biodiesel – Specification for Manufacturing and Blending.

Other renewable fuels: Renewable fuels, other than biodiesel or bioethanol, which originate from renewable feedstock and can be used as direct substitutes for petrol or diesel.

Petrol: This means a refined petroleum distillate, normally boiling within the limits of 15°C to 220°C, whether or not it contains additives, that is intended for use as a fuel in spark-ignition internal combustion engines (Petroleum Products Specifications Regulations 2002)

Petroleum Fuels Monitoring Levy (PFML): The petroleum fuels monitoring levy (PFML) currently applies to sales of petrol and diesel at the rate of 0.025c per litre. It is used for monitoring the quality, safety and security of petroleum fuels and for meeting New Zealand's IEA costs.

Petroleum Products Specifications Regulations 2002 (PPSR): These regulations specify the technical requirements to be met in respect of petrol and diesel supplied for use other than as an aviation fuel for motorcar, motorcycle, and powerboat racing, and for jet boats.

Renewable: An energy source that is inexhaustible and is constantly replenished by natural processes; includes non carbon technologies such as solar energy, hydro power and wind as well as technologies based on biomass (i.e. biofuels).

Vapour Pressure: This is a measure of the pressure exerted by the vapours delivered from a liquid at a given temperature and pressure.

Appendix: Form and content of the Biofuels Sales Obligation Annual Report

The information requirements for the annual report would be listed in legislation or regulation. A sample report might look like this:

XYZ Limited Biofuels Sales Obligation Annual Report For the year ended 31 December 20XX
Sales of petrol – litres Sales of diesel – litres Total sales of Petrol and diesel – litres
Sales of petrol – petajoules Sales of diesel – petajoules Total sales of Petrol and diesel – petajoules
Obligation percentage for the period
Obligation expressed as petajoules of biofuels
Plus Obligation rolled from previous years petajoules (incl 5%)
Sales of biofuel A – litres Sales of biofuel B – litres Total sales of biofuels – litres
Sales of biofuel A – petajoules Sales of biofuel B – petajoules Total sales of biofuels – petajoules
Obligation compared to actual total biofuels sold during the period
Adjustments:
Plus or minus Biofuels traded during the period - petajoules
Less Biofuel obligation rolled over to following year (-) - petajoules
Obligation compared to actual total biofuels sold with adjustments during the period

XYZ Limited has/has not met the Biofuels Sales Obligation

Penalties due - \$

Biofuels obligation to rollover to next year - petajoules

Plus 5% - petajoules

Total biofuels obligation to rollover to next year – petajoules

A statement to say: The sales of petrol, diesel and biofuels as reported in this Biofuels Sales Obligation Annual Report are the same as those reported to the Government under the PFML regime and on which the PFML has been paid during the year/period. All fuels represented in this report as biofuels have been made from feedstock that is 100% biomass.

Audit

It is proposed that liable firms be required to arrange and pay for an independent auditor to audit the Biofuels Sales Obligation Annual Report prior to submitting it to the government. The auditor would be required to prepare an assurance statement on whether or not the liable firm's Biofuels Sales Obligation Annual Report is true and correct. The level of assurance sought from the Auditor is a high level of assurance, in which the Auditor provides a reasonable, but not absolute, level of assurance on the accuracy of the data contained in the report. The Auditor will be required to be independent of the firm.

Verification

It is proposed that the government is, through the legislation for the obligation, enabled to verify any information contained in annual reports or additional information that is directly related to the obligation. The costs of such verification would be covered by the government. The government would undertake a verification of a report in whole or in part on an occasional basis as a means of monitoring compliance with the obligation, and, in the event that there is an aspect of a Biofuels Sales Obligation Annual Report that has been submitted that requires clarification and that, in the governments opinion, is not able to be rectified through correspondence with the firm concerned.