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Te Tari Tiaki Pūngao

Santiago, Chile  
17 y 18 de agosto del 2010

BIO V Seminario  
Latinoamericano y  
del Caribe de  
2010 Biocombustible

# Biofuels sustainability in New Zealand



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# Overview

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- About EECA
- Biofuels sources for New Zealand
- Biofuels policy and programmes in New Zealand
- Sustainability issues
- Sustainability reporting
- Summary





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# About EECA

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- EECA is a Government funded organisation
- Independent Board – reports to the Minister of Energy and Resources
- The Government's primary delivery agency for energy efficiency and renewable energy initiatives
- Our goals:
  - To maximise cost-effective energy savings and the co-benefits for all New Zealanders
  - Stimulate the uptake of renewable energy



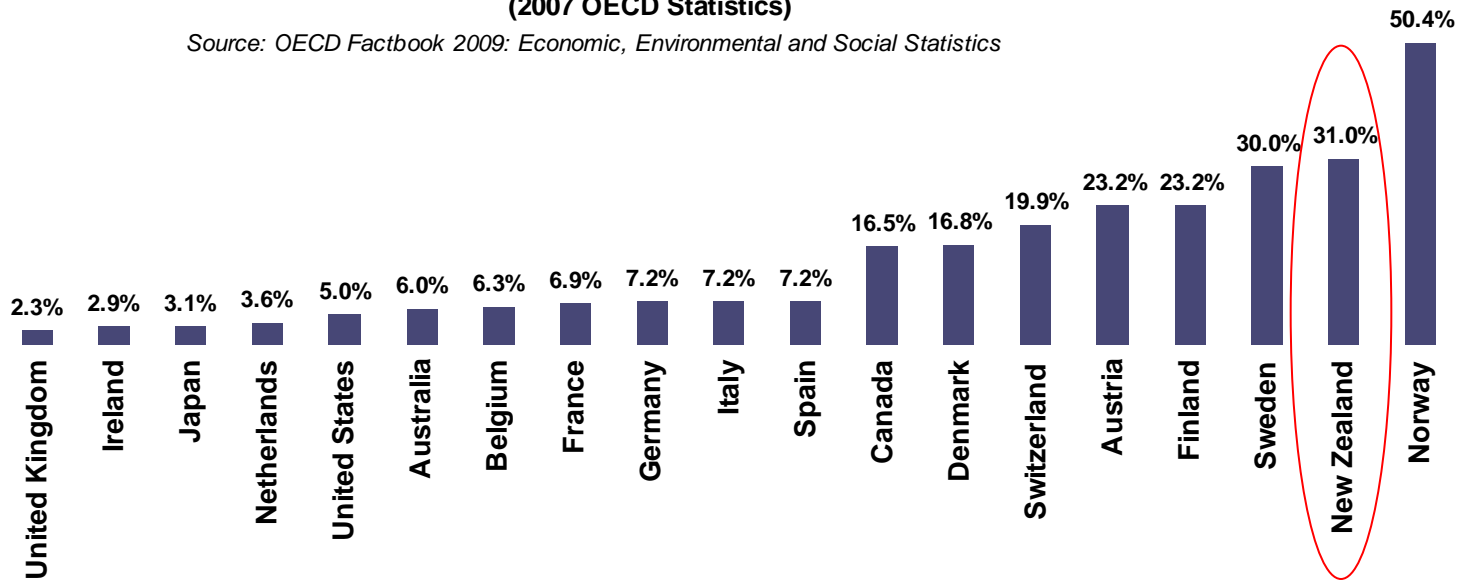


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# International comparison

## Contribution of renewables to total primary energy supply (2007 OECD Statistics)

Source: OECD Factbook 2009: Economic, Environmental and Social Statistics





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# Renewables in New Zealand

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Sector	% renewable, 2009
Residential	65%
Commercial	56%
Industrial	49%
Agriculture	19%
Transport	0,2%

Based on NZ electricity generation 73% renewable in 2009

Calculated from <http://www.med.govt.nz/upload/73585/EDF%202010.pdf>



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# Features of New Zealand transport fuels market

- NZ oil infrastructure jointly owned by four oil majors: BP, Shell, Mobil (Esso) and Chevron (Caltex). One independent oil product importer, Gull
- Around 70% of vehicles entering the New Zealand fleet are second-hand imports from Japan
- Petrol and diesel are taxed differently from each other: a tax of \$0,56 per litre is applied to petrol, but not to diesel fuel. Instead diesel vehicles, including diesel cars, pay “road user charges” according to mileage, vehicle type and axle weight





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## Sources of biofuels for NZ: current



- Ethanol from whey (lactose) – by product of milk processing – produced in three locations by Fonterra (which owns Soprole in Chile)
- Imports of sugarcane ethanol from Brazil
- Biodiesel from crops, used cooking oil and animal fats – New Zealand exports of animal fats could meet 5% NZ diesel demand



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## Sources of biofuels for NZ: future

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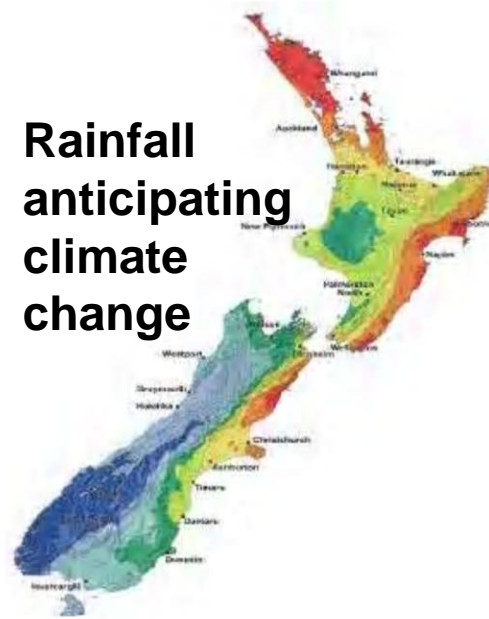
- Scion (New Zealand's forestry research institute) estimate 3,5 million Ha of marginal, low grade land available for forestry for biofuels in NZ, more than sufficient for NZ current transport fuel demand  
<http://www.scionresearch.com/general/science-publications/science-publications/technical-publications/bioenergy/bioenergy-options>
- Scion working with Carter Holt Harvey on *pinus radiata* to ethanol – process confirmed in the laboratory
- Willow for ethanol planted around Lake Taupo – also reduces farming nitrate run off into lake
- Two NZ research groups working on algae grown on sewage ponds for biofuels – one pilot plant operating producing renewable petrol and renewable diesel

# Marginal land available for biofuels from wood

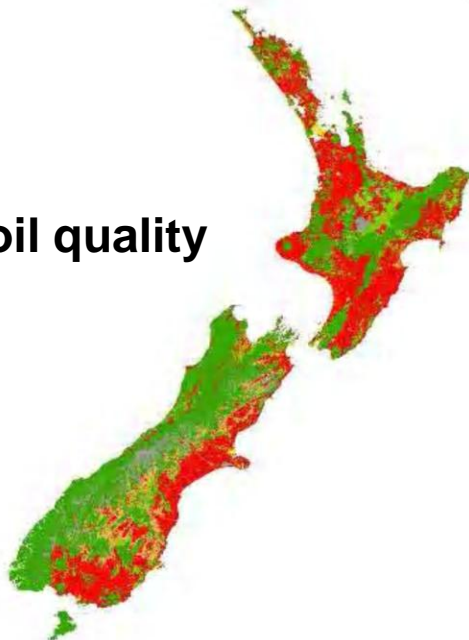
**Marginal  
land**



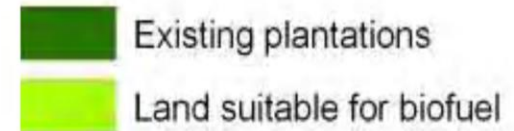
**Rainfall  
anticipating  
climate  
change**



**Soil quality**



**Source: Bioenergy  
Options for New  
Zealand, Scion**





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## Barriers to biofuel blends

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- International oil companies make their money on upstream assets (oil extraction), not retailing which is low profitability in a mature market like New Zealand, so little incentive to invest in retailing biofuel blends
- Joint oil company ownership of single refinery and bulk distribution infrastructure makes it hard for one oil company to do something different from the others
- Oil price uncertainty makes biofuel production investment very risky
- Consumer resistance to a new fuel option
- **Consumer uncertainty about biofuel sustainability**
- Motor industry resistance to a new fuel option: they have to take a small risk saying biofuel blends are OK in their vehicles, yet no increase in profit
- Biofuel blends not transported in multi-product pipelines, due to risk of contamination of aviation fuel



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# New Zealand biofuels policy

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- Zero rate of tax on ethanol confirmed to 2012 but already no tax on either diesel or biodiesel
- Group of Ministry of Economic Development, Ministry of Transport and EECA developed biofuels mandate policy, lowest cost policy option, with public consultation from 2006
- Principal driver for policy was greenhouse gas reduction
- E10 and B5 limits in retail sales of biofuels (wholesale customers have written contracts for supply and can use biofuels in any proportion)





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## Biofuels Sales Obligation

<b>Year 1 2008</b>	<b>Year 2 2009</b>	<b>Year 3 2010</b>	<b>Year 4 2011</b>	<b>Year 5 2012 onwards</b>
<b>0,5%</b>	<b>1,0%</b>	<b>1,5%</b>	<b>2,0%</b>	<b>2,5% of combined petrol + diesel sales must be biofuels on an energy equivalent basis</b>

- Local or imported sustainable biofuels
- Up to oil companies how to meet obligation – what blends, biofuel does not need to be in all fuel, can use ethanol, biodiesel, biogas etc...
- Trades between oil companies allowed
- Financial penalty for non-compliance higher than cost of biofuels



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## Biofuels Sales Obligation: sustainability principles

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- Must emit significantly less greenhouse gas over their lifecycles than fossil fuels: minimum 35% reduction in net GHG
- Must not compete with food production or be produced using land of high value for food production
  - by-products of food production OK
  - ethanol from sugarcane OK
  - rotational oilseed crops OK
- Must not reduce biodiversity or affect land with high conservation values (protects rainforests)



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## EECA studies on biofuel sustainability

- Greenhouse gas analysis of animal fat biodiesel

Stage	Stages in calc.	Energy input : Output ratio	Energy saving %	Greenhouse Gas Reduction
1. Biodiesel production and transport	1	0,18	85 %	93%
2. Plus rendering	1+2	0,48	60%	69%
3. Plus farming and meat processing	1+2+3	0,50	58%	49%

- Review of sustainability of Brazilian sugarcane ethanol
- Sustainability and greenhouse gas analysis of rape seed biodiesel grown in rotation with other crops to boost the production of following crops

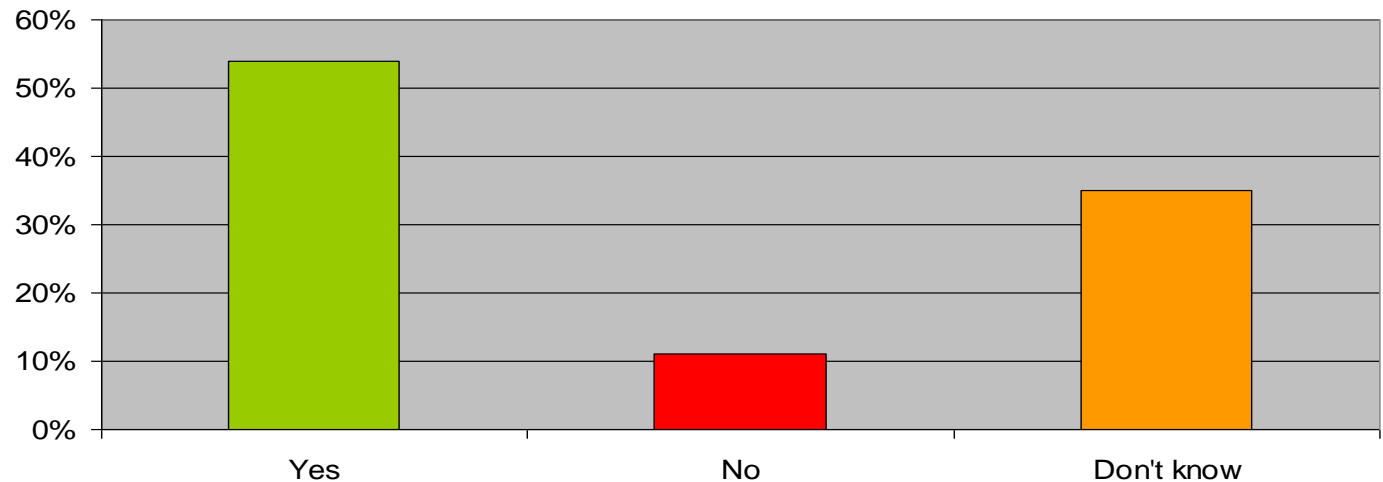


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# Public attitudes to biofuels

- EECA public opinion surveys show a relatively high proportion of consumers are uncertain about biofuels (35%) with **sustainability** being their main doubt
- 66% of people want to know more about biofuels – 41% “know a little and would like to know more” and 25% “know nothing and would like to know more”

**Public support for biofuels, 2Q 2010**





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# Information campaign

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## Key messages

- Not all biofuels are created equal – the ones in NZ are good for the environment and not from food
- Biofuel blends are OK in your car or truck

## Channels

- Media articles pre-empting or responding to overseas corn ethanol debate, rising food prices
- Information to motor industry, mechanics and car sales people

THIS FUEL IS BETTER  
FOR THE ENVIRONMENT

FIND OUT HOW  
[eeca.govt.nz/biofuels](http://eeca.govt.nz/biofuels)



**bio  
FUEL**



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# Gull ethanol launch

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- Gull launched 10% whey ethanol blends in 2007
- Addition of 10% ethanol allowed a lower octane fuel to be upgraded to higher value 98 octane
- Gull now has 10% ethanol in all its petrol in NZ
- Looking to import Brazilian ethanol to expand





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## Mobil ethanol launch

- Mobil (Esso) launched 3% ethanol in low octane petrol and 10% ethanol in high octane petrol in Wellington to gain experience ahead of the obligation
- Ethanol sourced from Brazil
- 3% blend was as a result of motor industry saying used Japanese import cars could only use 3%
- Has not expanded ethanol use beyond Wellington





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## Status of the obligation

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- Legislation passed September 2008
- Obligation commenced October 2008
- New Government elected November 2008
- Obligation repealed December 2008
  
- New Government introduces biodiesel grants for New Zealand based biodiesel manufacturers – NZ\$36 million over three years
- EECA develops voluntary sustainability reporting scheme for biofuels

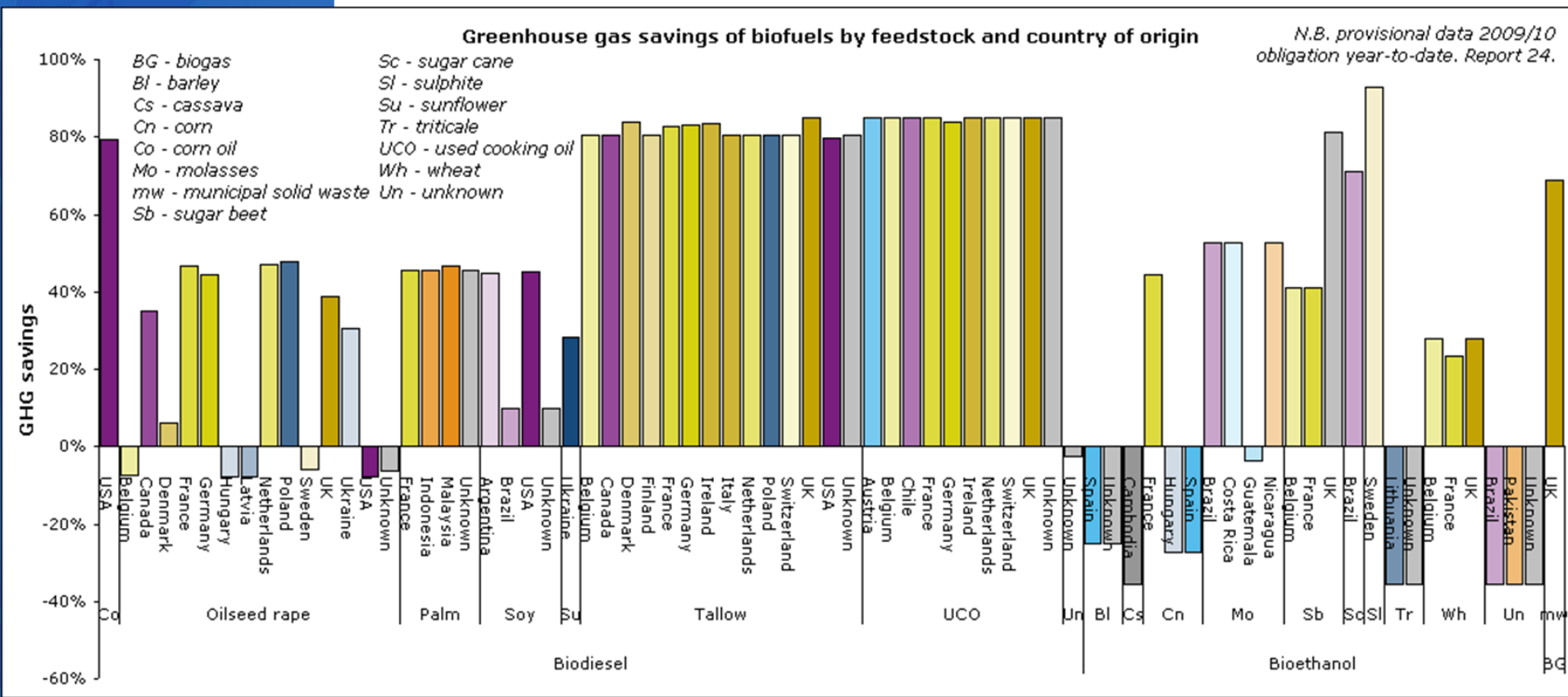


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# Voluntary sustainability reporting

- NZ scheme based on UK Renewable Transport Fuels Obligation reporting scheme

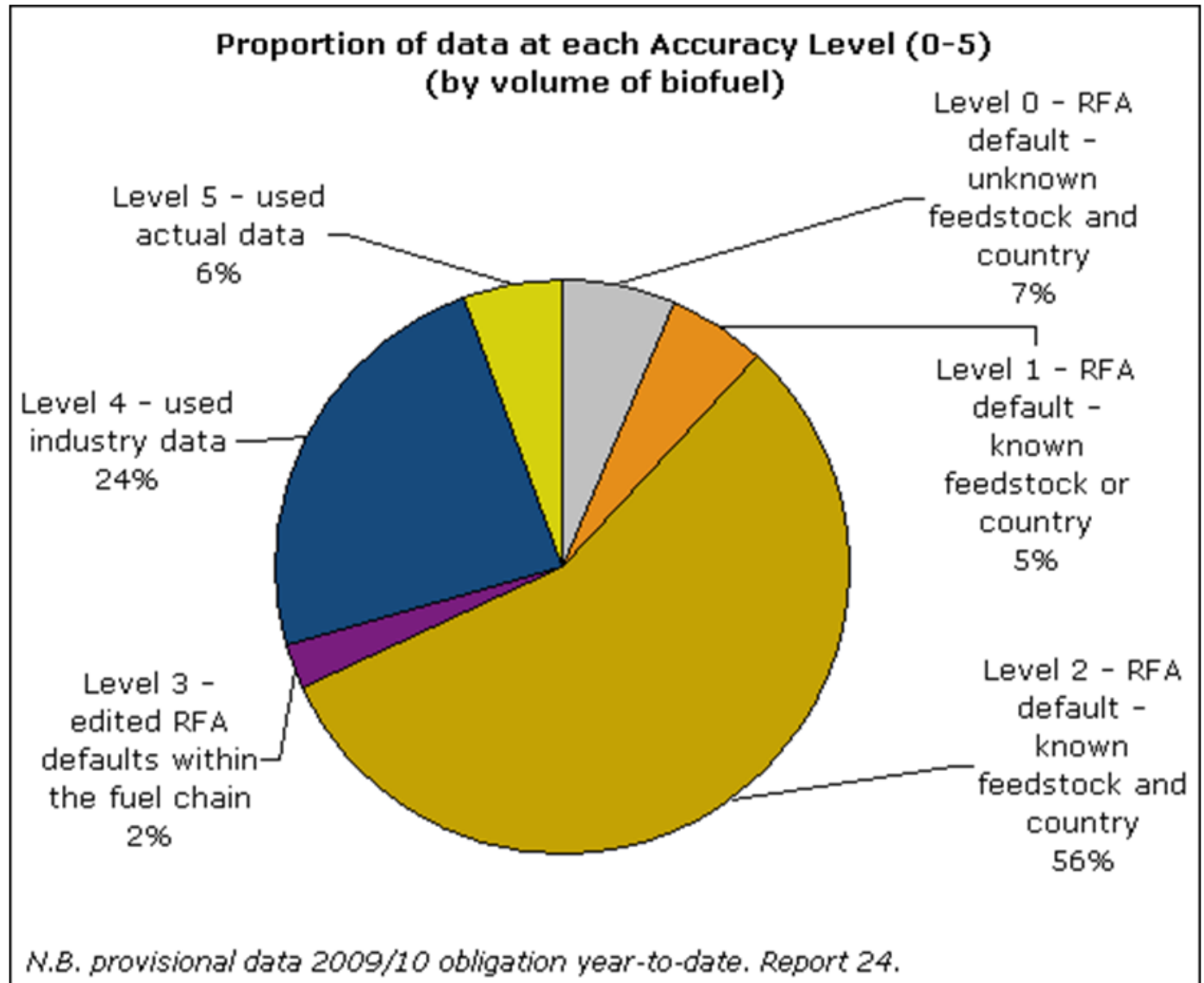
<http://www.renewablefuelsagency.gov.uk/carbon-and-sustainability/rfto-reports>





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# UK RTFO reporting levels

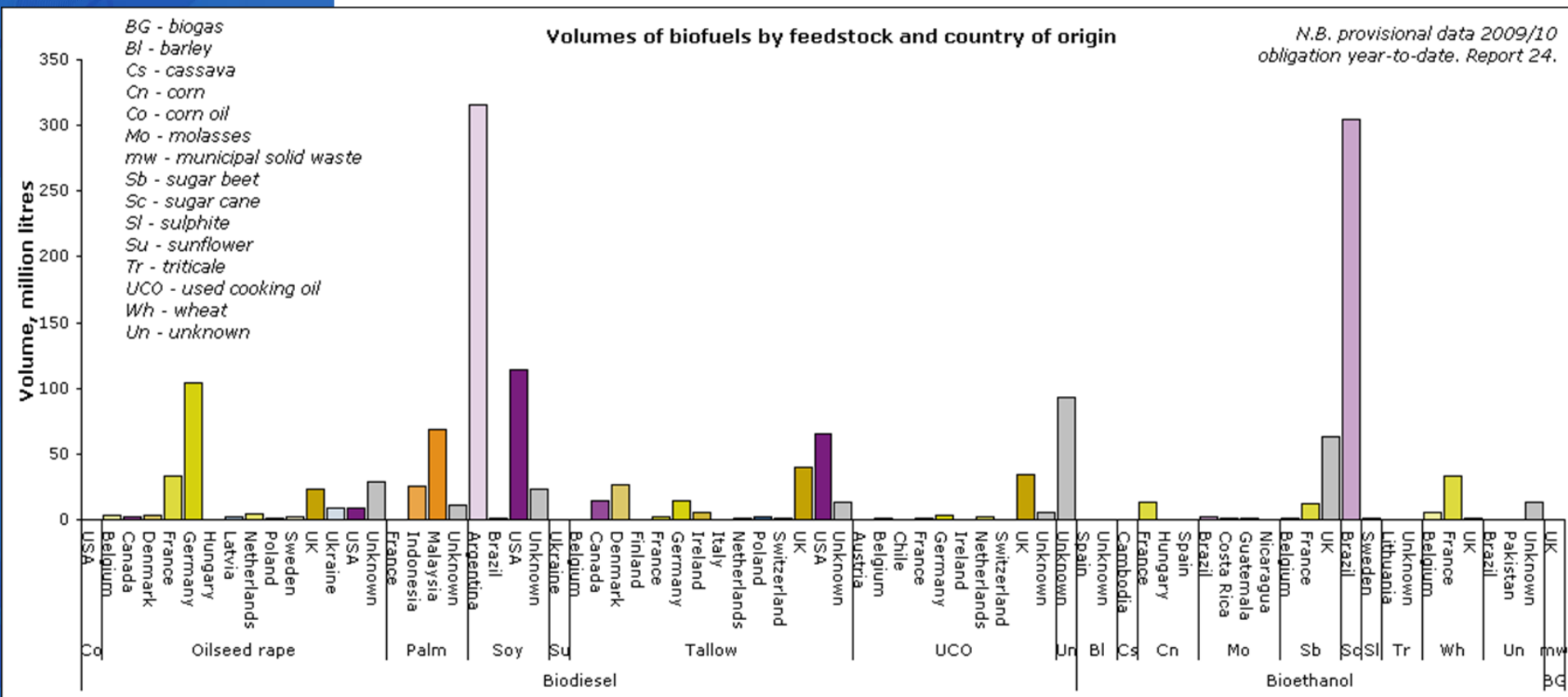




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# UK RTFO actual biofuel volumes 2009/2010

- Argentina and Brazil dominate actual biofuel supply volumes under UK RTFO





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## New Zealand voluntary biofuel sustainability reporting

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- The lifecycle greenhouse gas emissions values for default biofuel types in NZ have been determined and independently checked
- The biofuel emissions value are compared against NZ life cycle emissions values for mineral gasoline or petrol
- The resulting greenhouse gas emissions reduction figures are published on our website for companies voluntarily participating in the scheme <http://www.eeca.govt.nz/biofuels/sustainability>
- Companies can choose to do a more detailed determination if they think their feedstocks or process is better than the default
- Full information on the detailed modelling used to determine the greenhouse gas emissions calculations and peer reviews of the methodology and figures are also given on the website



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# New Zealand voluntary biofuel sustainability reporting webpage

<http://www.eeca.govt.nz/biofuels/sustainability>

Biofuel seller	Blend/Fuel	Biofuel feedstock	Feedstock origin	Greenhouse gas emissions compared to petrol / diesel	Fuel company statement
Biodiesel New Zealand	100% biodiesel	Used cooking oil (90%) and rapeseed oil (10%)	New Zealand	Greater than 80% reduction	Biodiesel New Zealand's biodiesel is canola-based. The biofuel is produced from a blend of used cooking oil, graded for optimum use, and canola oil (oilseed rape) from rapeseed grown in New Zealand. The rapeseed is grown as a break-crop (between other crops), which allows farmers to condition the soil and raise the fertility of the land for future use in addition to producing both food and fuel. Once the canola oil is extracted, the remaining seed cake is a high protein animal food. For further information visit <a href="http://www.biodiesel-nz.co.nz">www.biodiesel-nz.co.nz</a>
Environ Fuels	20% biodiesel blend	Used cooking oil	New Zealand	16-18% reduction	"Environ Fuels utilises used vegetable oil feedstock, from the food and confectionery industry, in producing high quality biodiesel to lower carbon emissions and the effects they have on the environment. Currently all of the waste oil is sourced from New Zealand and the biodiesel made from that does not compete with food production or biodiversity, which is an important prerequisite in principles of sustainability". For further information visit <a href="http://www.environfuels.com">www.environfuels.com</a>
Anchor Ethanol Ltd	100% bioethanol	Whey	New Zealand	35-50% reduction	



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## Parliamentary Commissioner for the Environment's report on biofuels

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- The Parliamentary Commissioner for the Environment (an independent official of Parliament, not the Government of the day) published a report in July 2010 on a strategic view of biofuels and sustainability in NZ [http://www.pce.parliament.nz/data/assets/pdf\\_file/0017/5138/Biofuel\\_web\\_final\\_non\\_embargoed.pdf](http://www.pce.parliament.nz/data/assets/pdf_file/0017/5138/Biofuel_web_final_non_embargoed.pdf)
- Overview statements in the report included:

***It makes no environmental sense at all, and indeed is unethical, for us to import “bad” fuels  
Some biofuels are good, some are bad, and some are probably downright ugly***



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



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# carbonZero

- First ***internationally accredited*** greenhouse gas certification scheme in the world
- First accredited scheme outside the USA verified to ISO 14605 and the only accredited scheme in Chile
- Certification accepted in the 50 largest economies in the world
- Division of Landcare Research, a NZ Government owned research organisation
- [www.carbonzero.cl](http://www.carbonzero.cl)
- [www.carbonzero.co.nz](http://www.carbonzero.co.nz)





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# Summary

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- Providing verified sustainability information is increasingly important for countries exporting biofuels
- Public want to know biofuels they are offered are sustainable
- New Zealand has developed a voluntary biofuels sustainability reporting scheme based on the UK RTFO
- Scion's "Bioenergy Options for New Zealand" shows very significant long term potential for biofuels from New Zealand feedstocks
- Major oil companies would not introduce biofuels in New Zealand without the obligation
- Key barrier of oil price uncertainty remains, making any biofuels investment risky and warranting Government support to commercialise biofuels