The Bioenergy Association of New Zealand

Bioenergy Strategy Carbon Dioxide Savings

22 February 2011

Summary

The Government's 50:50 proposal[1] aims to reduce net CO_2e emissions by 31 million tonnes annually by 2050. It is estimated that the New Zealand Bioenergy Strategy[2] could deliver by 2040 biofuels which could provide nearly 40% of the greenhouse gas emissions needed. Transport using biofuels would provide most of the estimated CO_2e savings at just under 11 million tonnes per year or 35% of the total required. The Bioenergy Strategy appears to provide similar greenhouse gas reductions to MED's Energy Outlook 2009/2010 "Changing Gear" high uptake scenario.

Introduction

In 2008 the net carbon dioxide equivalent (CO_2e) emission for New Zealand was 48.5 million tonnes. This is made up of 74.7 million tonnes of emissions offset by 26.2 million tonnes due to land use changes and forestry. Transport contributed about 14 million tonnes of CO_2e emission in 2008 and in 2009.

The Government's 50:50 proposal aims to reduce net CO_2e emissions by 31 million tonnes annually by 2050.

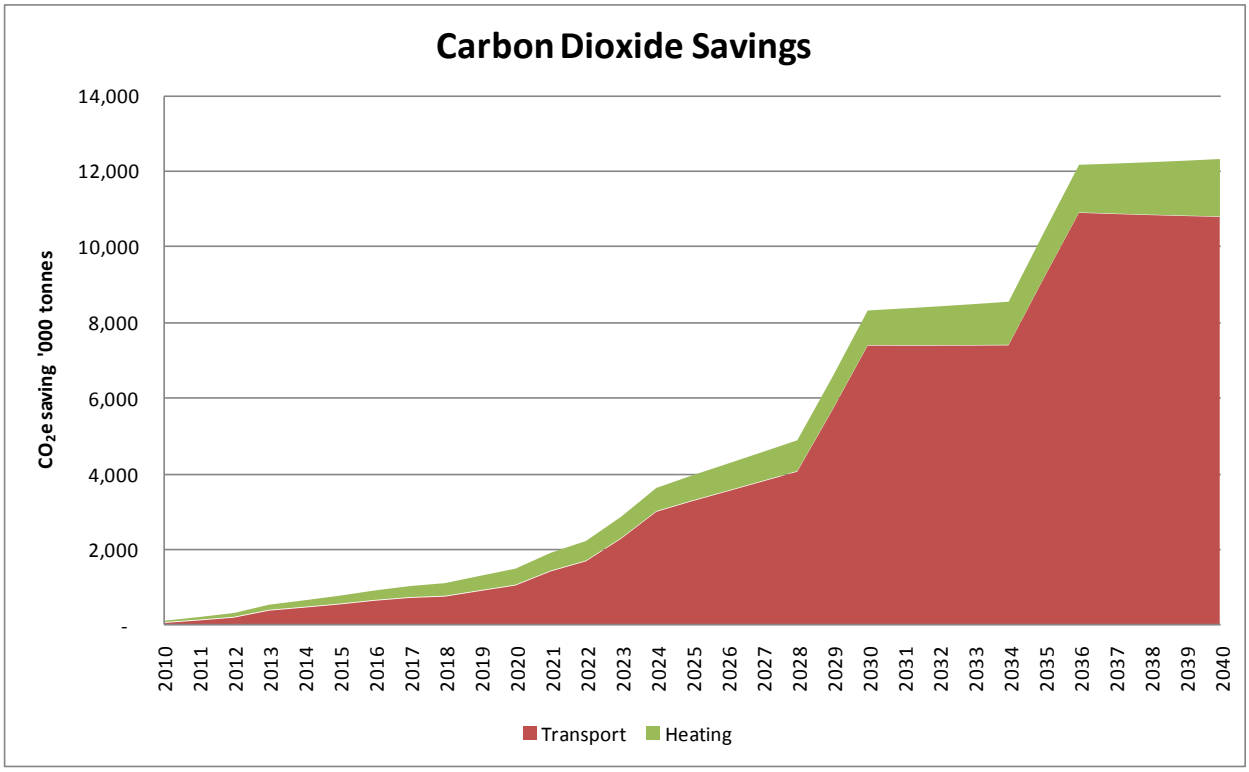
Bioenergy Strategy Carbon Dioxide Savings

Estimated carbon dioxide equivalent (CO_2e) savings as a result of the implementation of the Bioenergy Strategy are shown in Figure 1

[1] http://www.beehive.govt.nz/release/50-50-emissions-reduction-target-proposed

[2] http://www.bioenergy.org.nz/NZBioenergyStrategy2010.pdf

Figure 1: Estimated carbon dioxide savings resulting from the Bioenergy Strategy



By 2040 transport using biofuels will provide most of the estimated CO_2e savings at just under 11 million tonnes per year or 35% of the total required.

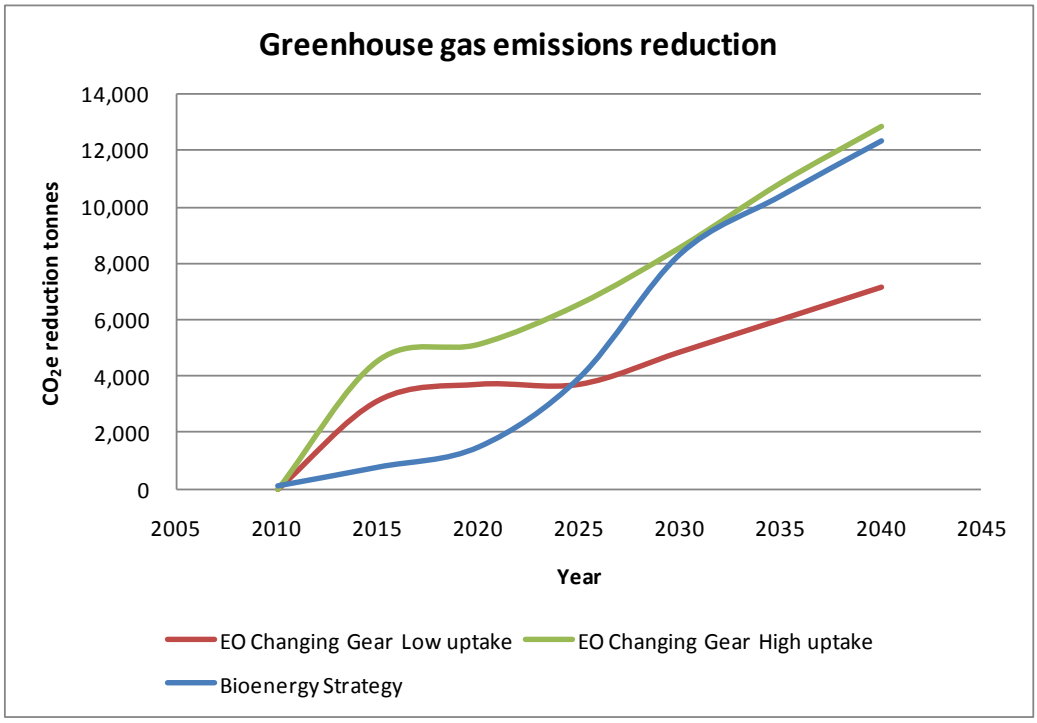
Comparison with MED Energy Outlook 2009/2010 "Changing Gear" Scenario

The Changing Gear scenario considers an alternative future. The driving forces behind this scenario are higher international oil and emissions prices than in the Reference Scenario. Two pathways are considered, low and high uptakes.

The reduction in greenhouse gas emissions from the Energy Outlook Reference Scenario has been estimated from the Energy Sector Greenhouse Gas emissions graph and the two pathways compared with that of the Bioenergy Strategy.

The results are shown in Figure 2.

Figure 2: Comparison greenhouse gas reductions between Bioenergy Strategy and MED Energy Outlook Changing Gear scenario



In the early years to 2025 there is a large difference between Energy Outlook Changing Gears and the Bioenergy Strategy. In the Changing gear scenario motorists respond by making greater use of public transport in metropolitan areas and purchasing more efficient internal combustion and hybrid vehicles which is not reflected in the Bioenergy Strategy.

However from 2020, in the Changing gear Scenario electric vehicles make up an increasing portion of the light vehicle fleet and there is development of a substantial domestic biofuel industry. There is widespread switching from coal and gas to wood for industrial heat. This is similar to the Bioenergy Strategy which has a rapid build up of bioenergy use from 2020 (but starting from a lower base) to show very similar greenhouse gas reductions to that of the changing gear high uptake pathway by 2030 and future years.

Assumptions

- **Transport**

Biomass feedstock converted to transport fuels as used in the Strategy. This is assumed to replace the equivalent amount, in energy terms, of fossil fuel.

Emission factors are those given by the Ministry for the Environment (MfE). The current trend of increasing diesel use at the expense of petrol continues over the 30 years.

The actual CO_2e savings are initially 65% of those calculated using the emission factors to allow for CO_2e emitted during the biofuel production process. During the 30 years there is a gradual improvement in the production technology of a further 10% to 75%.

- **Heating**

Only biomass substitution for fossil fuels are considered towards the savings.

Emission factors are those given by MfE for stationary sources.

Fuel oil and diesel CO_2e savings are treated in the same manner as transport fuels.