Liquid Biofuels for Transport Fact Sheet

The Biofuels Directive (2003/30/EC) defines biofuels as "liquid or gaseous fuel for transport produced from biomass". It requires Member States to "ensure that a minimum proportion of biofuels and other renewable fuels" are "placed on their markets". Reference targets, "calculated on the basis of energy content of all petrol and diesel for transport purposes placed on their markets", are proposed in the Directive as follows:

2% by 31st December 2005

5.75% by 31st December 2010.

It is also stated that a report by the European Commission to the European Parliament in 2006, as required by the Directive, could be followed by a Commission proposal for mandatory targets.

For Ireland the 2010 target of 5.75% would equate to 12 peta-joules (PJ) of biofuels on an energy basis. This would translate to 375 million litres of biodiesel **OR** 569 million litres of bioethanol **OR** some combination of these and other renewable fuels.

In addressing the intent of the Directive, options for Ireland based on existing technologies include pure plant oil and biodiesel as substitutes for mineral diesel, and bioethanol as a substitute for petrol.

Pure Plant Oil (PPO)

Pure plant oil is produced by pressing oilseeds, for example from oilseed rape (OSR), and filtering the resulting oil. The filtered oil can be used as a fuel in a diesel vehicle whose engine has been fitted with an appropriate modification kit with a typical cost including installation of €1,600.

Typical OSR crop yield:	3 tonnes seed per hectare
Typical PPO yield per tonne of seed	33%
Typical PPO delivered cost excl. excise duty[1] and VAT	€0.72 / litre
Typical PPO lower calorific value	32 MJ / litre[2]

Biodiesel

Biodiesel is produced from pure plant oil, recovered vegetable oil or beef tallow. These feed materials are converted by a trans-esterification process, which involves the use of methanol (or ethanol). Biodiesel and a glycerol co-product are produced. Biodiesel which meets the standard EN 14214 can be blended with mineral diesel in a mix of up to 5% biodiesel and used as a fuel in a standard diesel vehicle. Greater blends may be used in engines which have been approved for such use by the manufacturers.	Typical Biodiesel delivered cost excl. excise duty[1] and VAT	€0.80 / litre
	Typical Biodiesel lower calorific value	32 MJ / litre[2]

Bioethanol

Bioethanol is produced from sugar beet and wheat through a process of hydrolysis, fermentation and distillation. Bioethanol can be blended with petrol[3] in a mix of up to 5% and used as a fuel in a standard petrol vehicle. Greater blends of bioethanol are also possible where the resulting mixture is used in flexible fuel vehicles (FFV's).	Typical Bioethanol delivered cost excl. excise duty[4] and VAT	€0.74 / litre
	Typical Bioethanol lower calorific value	21.1 MJ / litre[5]

Benefits of Biofuels

Biofuels derived from biomass produced in Ireland address important policy areas:

- Energy – contribute to security of supply and the development of indigenous renewable energy sources.
- Environmental – contribute to greenhouse gas emissions reduction and waste management. On a life cycle analysis basis the use of biofuels typically results in greenhouse gas emissions reductions of approximately 50% compared to that from the displaced fossil fuel.
- Agricultural – offer new opportunities for farmers in the context of CAP reform.
- Social – contribute to employment generation in rural areas and enhancement of local economies.

References: Liquid Biofuels Strategy Study for Ireland, SEI, December 2004

[1] Excise duty on diesel is €368.05 per 1,000 litres.
[2] Mineral diesel has a lower calorific value of approximately 36.4 MJ / litre.
[3] The base petrol requires a small modification so that the blend complies with the legal limit on vapour pressure (European Directive 98/70/EC and its amendment 2003/17/EC).
[4] Excise duty on unleaded petrol is €442.68 per 1,000 litres.
[5] Petrol has a lower calorific value of approximately 32 MJ / litre.

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