

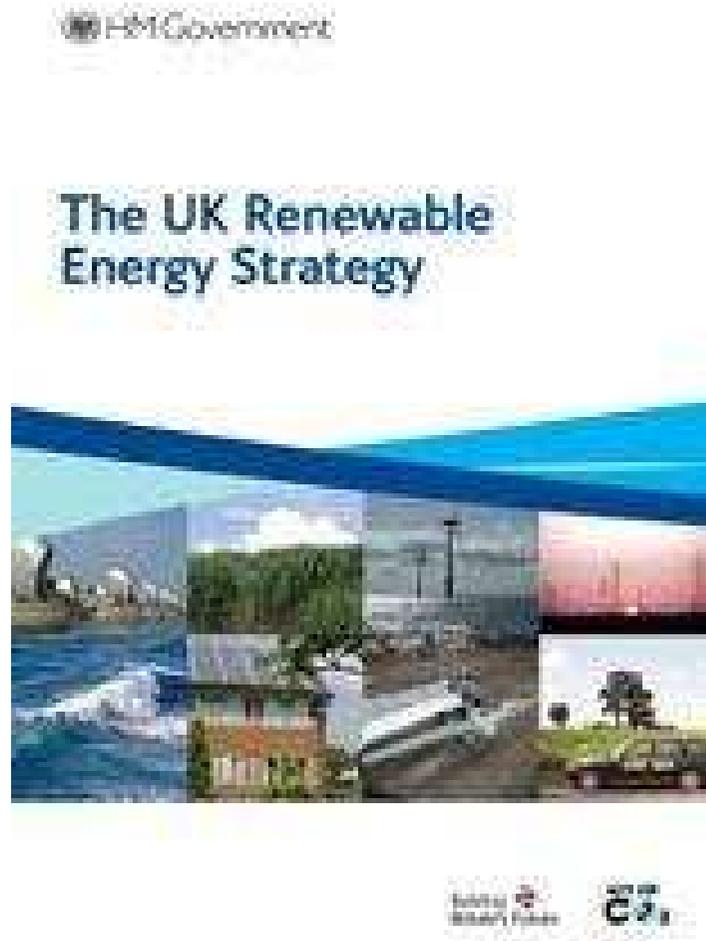
agri benchmark Cash Crop Conference 2010

GHG Balance for Biodiesel
Strategic Issues for Rapeseed Production

Ben Lang
12 May 2009



The UK Renewable Energy Strategy



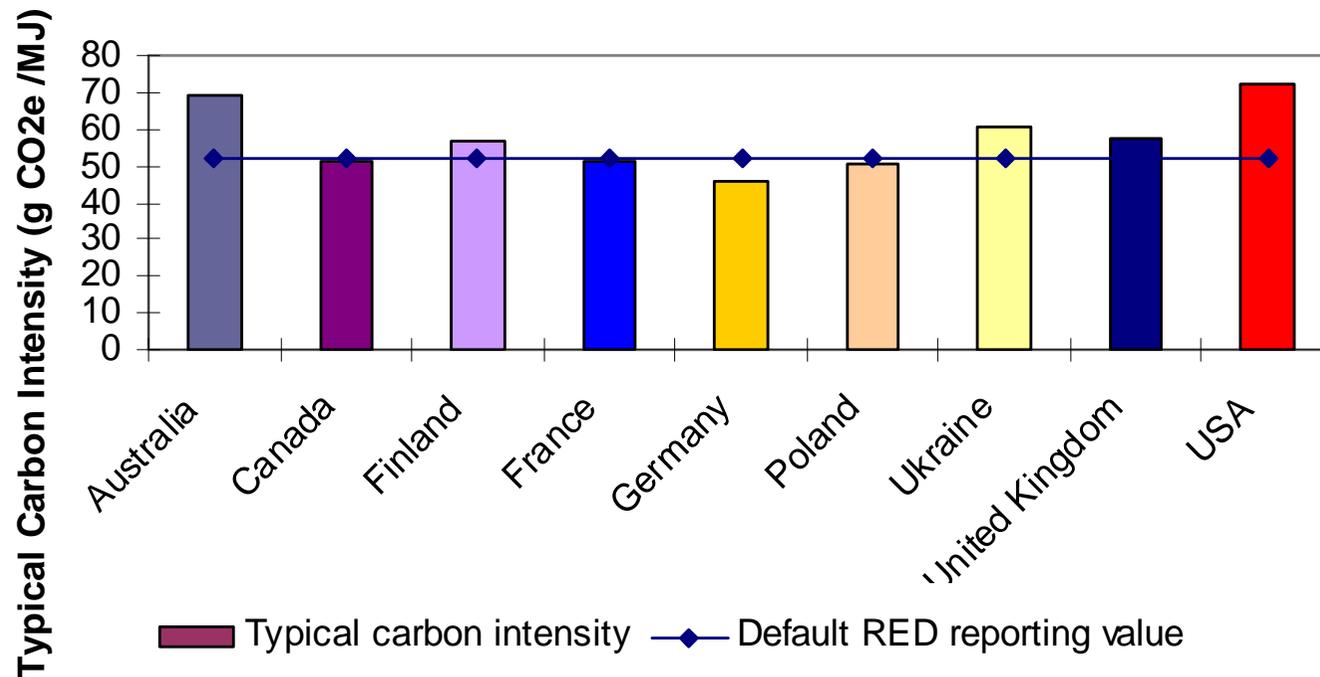
The UK government will implement RED by amending the current Road Transport Fuel Obligation (RTFO) Order. This is expected by March 2011



The Renewable Fuels Agency (RFA) have responsibility for reporting RED performance in the UK

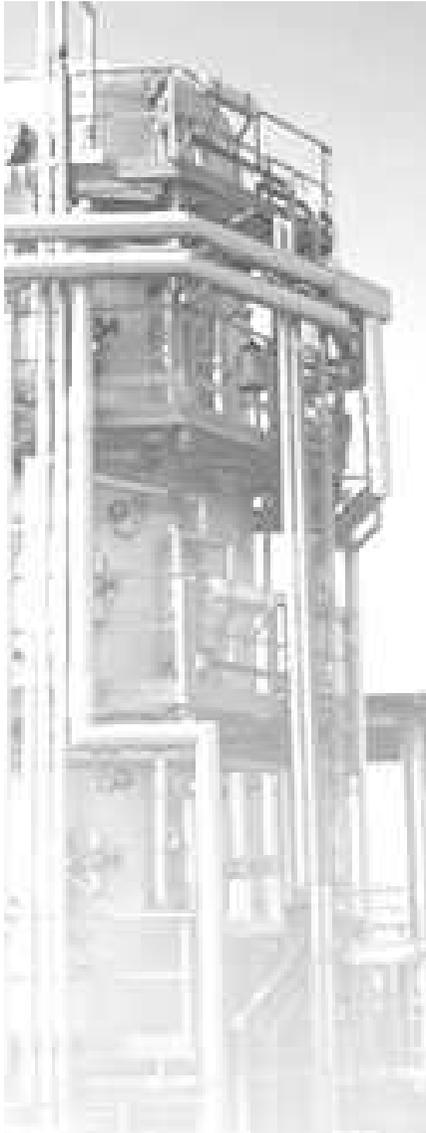


RED Technical Standards: Carbon Intensity



Source: RFA

UK Rapeseed Biodiesel Infrastructure



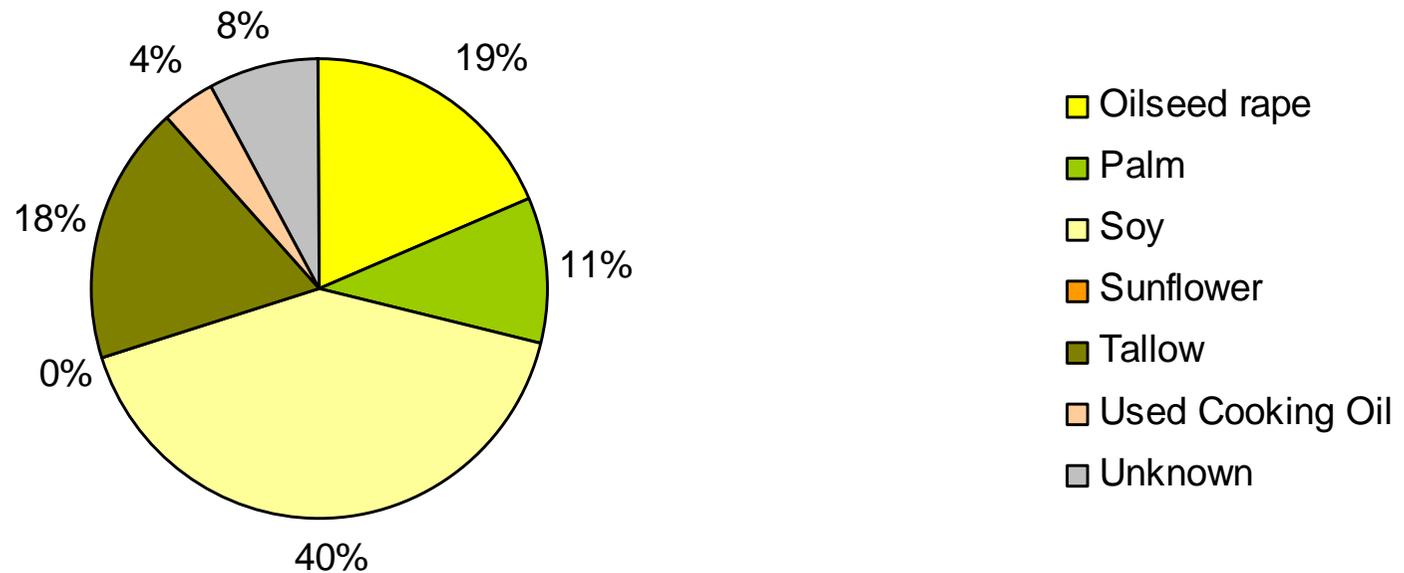
Greenergy
Humberside



Biofuels Corporation
Teesside

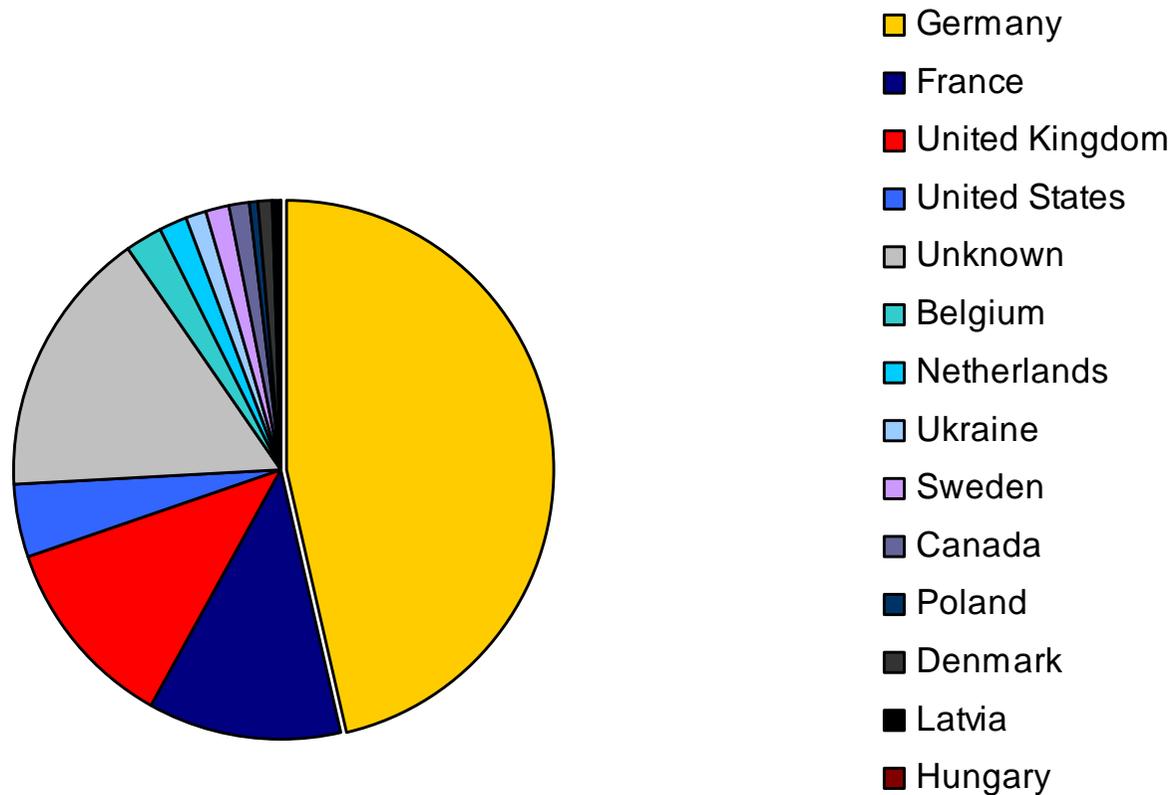


Raw Material for UK Biodiesel



Source: RFA April 2009 to January 2010

Origin of Rapeseed for UK Biodiesel



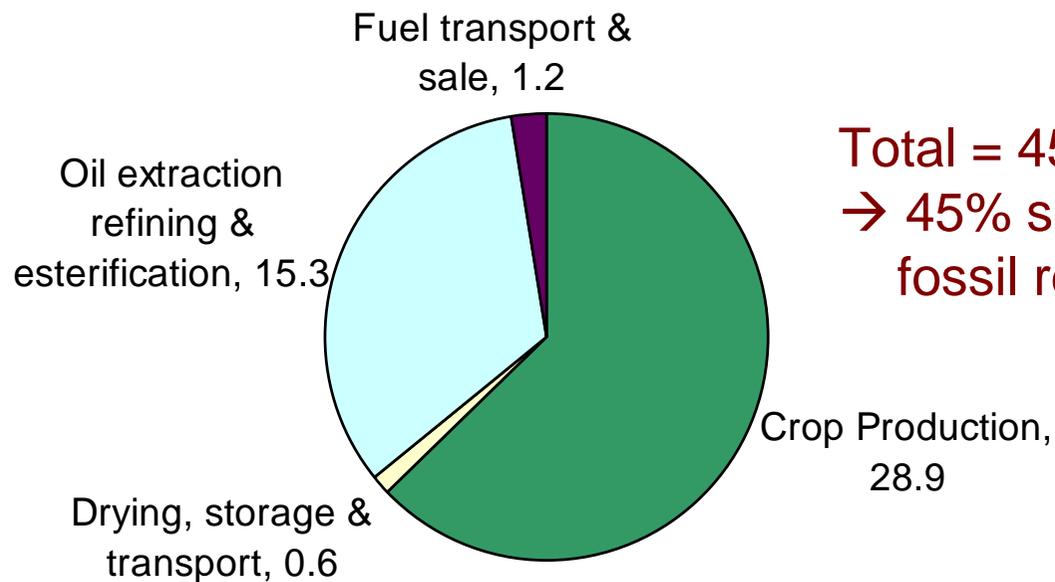
Source: RFA April 2009 to January 2010

The Current UK Market



The UK currently sources only 2% of its biodiesel requirement from domestic rapeseed production, so the incentive to introduce low CO₂ production methods for rapeseed is limited.

Typical GHG Balance: UK Biodiesel from Rapeseed

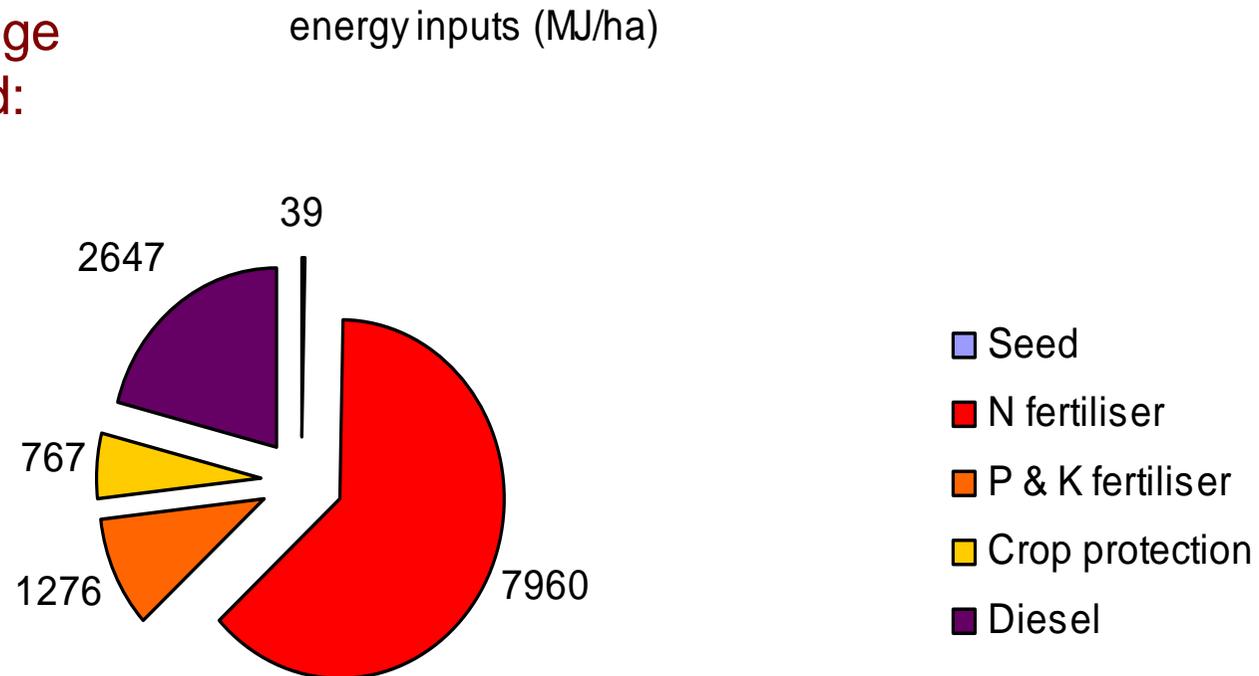


Total = 45.9 g CO₂e /MJ biodiesel
→ 45% saving compared to fossil reference

Source: RFA

Rapeseed: Share of Energy Inputs

Five year average
yield in England:
3.3 tonnes per
hectare



Source: HGCA

UK Nitrogen Use by Rapeseed

- Average nitrogen application:
194kgN/ha*
(range 75kgN/ha to 275kgN/ha)
- Genetic variation in economic optimum: 60kgN/ha**
- Average nitrogen uptake:
96kgN/ha**



* British Survey of Fertiliser Practice 2008

** The potential to increase productivity of wheat and oilseed rape in the UK, ADAS

Fertiliser Practice: Stabilised Nitrogen Fertiliser



Stabilised nitrogen fertiliser to reduce volatilisation of urea

Fertiliser Practice: Efficient Use of Livestock Waste



Recent fertiliser price increases have provided an incentive for improved management of plant nutrients from waste.

Improvements in Farm Practice¹

Some producers could improve farm practice:

- Assess N supply from soil
- Canopy management – seed and nitrogen
- Base fertiliser requirements on crop potential
- Use agronomic guidance to calculate N requirement



¹ HGCA Pulses and Oilseeds Conference 2009

Research: Strategies for CO₂ Reduction¹

Husbandry

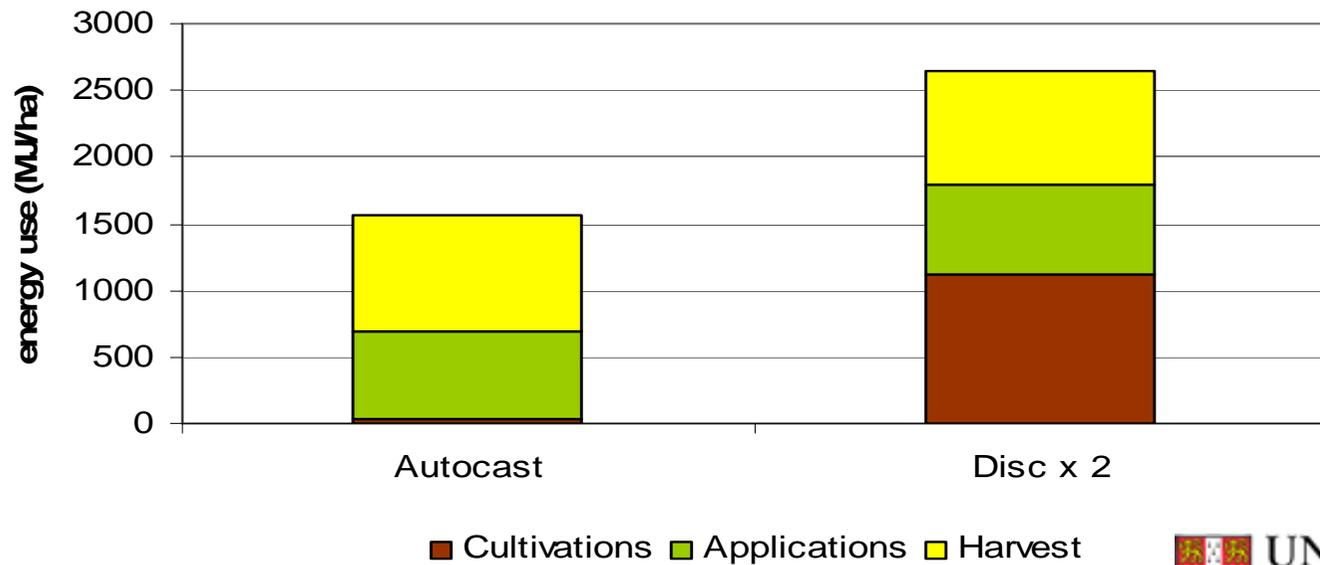
- Improved nitrogen management according to genotype
- Management of disease (and therefore yield loss) after fertiliser application

Genetic

- Improvement in N uptake efficiency
 - Identify heritable plant characteristics associated with low N requirement
 - Carry out rapid assessment
 - Seek novel sources of genes

¹ The potential to increase productivity of wheat and oilseed rape in the UK, ADAS

Fuel Use in Rapeseed Production



Based on original work by Levington Agriculture Ltd, 2000

Conclusions

Farmers adapt rapidly to markets – but RED requirements are perhaps clearer to farmers in Germany than to other EU farmers (e.g. UK)

In UK, RED standards will be important when more biodiesel is sourced from rapeseed

Basic science provides evidence that rapeseed can be produced with lower CO₂ emissions but farm-level research is less well developed

Low CO₂ production technology will not be the same in every country

