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Sustainability criteria for transport biofuels

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Cambridge Centre for Climate Change Mitigation Research (4CMR)

4CMR Foreseeing Mitigation

Sustainability criteria for transport biofuels: outline

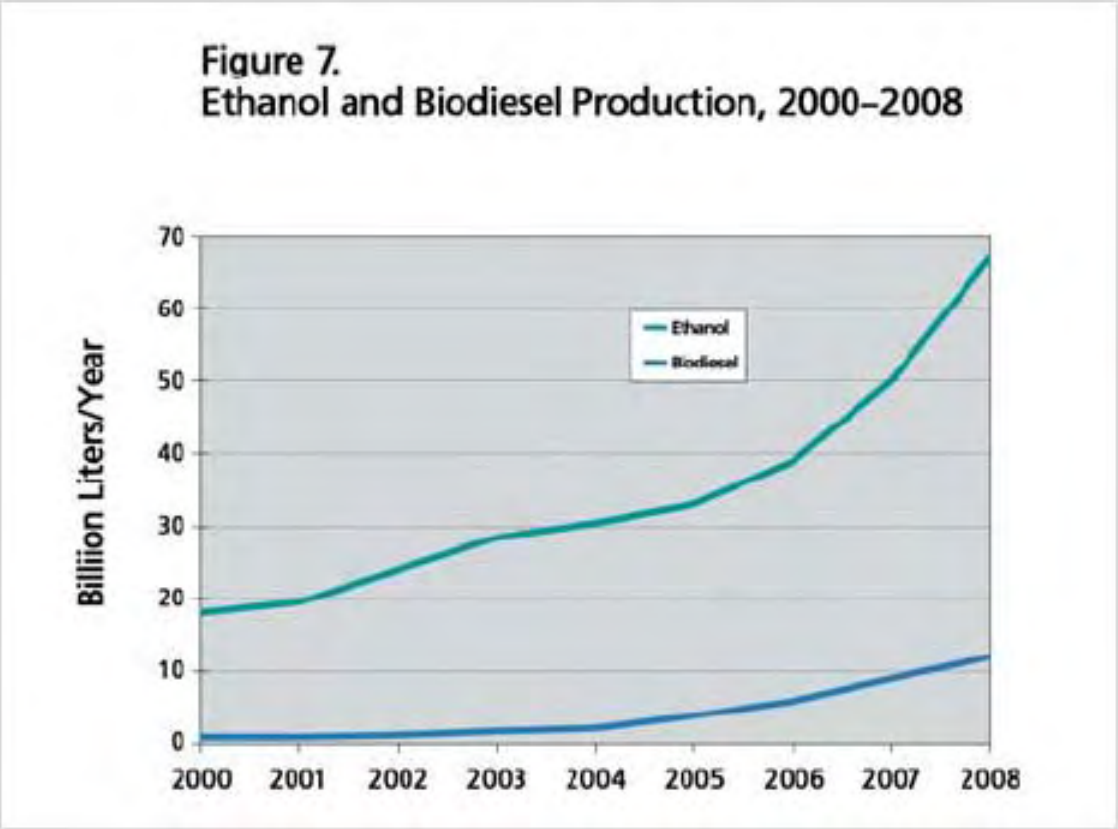
1. Why do we need sustainability criteria?
2. Current EU policy framework
3. Sustainability criteria in the Renewable Energy Directive
4. The UK approach – Renewable Transport Fuels Obligation
5. Greenhouse gas accounting
6. Sustainability reporting for the RTFO
7. A comparison between UK and EU approaches
8. Why should farmers care?

1. Why do we need sustainability criteria?

- **Climate change** and **energy security** are the drivers behind biofuel policy
- Biofuels do not always reduce emissions relative to fossil fuels
- **Land use change** can enhance greenhouse gas emissions from biofuel production
- But it is *possible* to supply a good proportion of our energy needs from agricultural biomass WITHOUT these problems
- Sustainability criteria are required to ensure that biofuels **mitigate** against **climate change** and don't contribute to it

Why do we need sustainability criteria?

Global production of biofuels is increasing

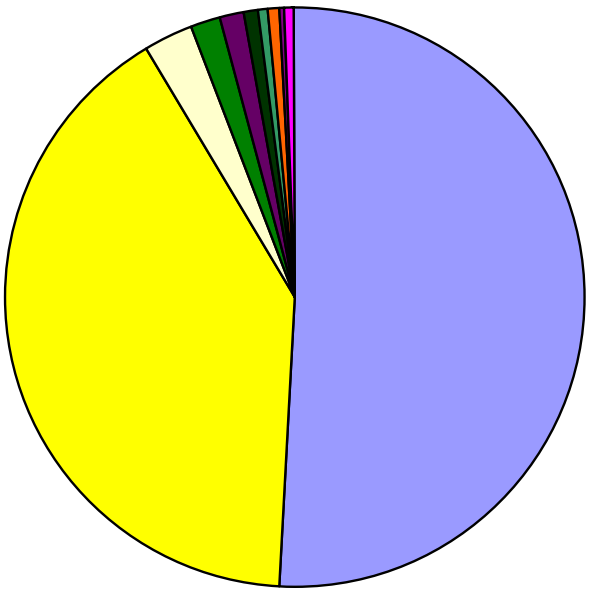


Source: Renewable Energy Policy Network REN21

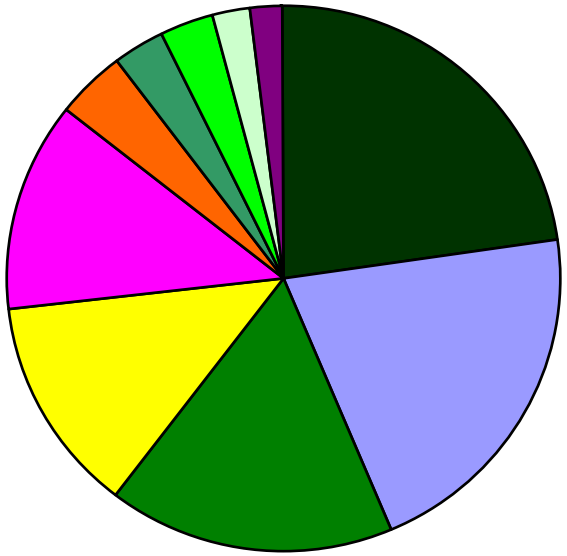
Renewables Global Status Report 2009 update

Who's producing it?

Fuel ethanol 2008



Biodiesel 2008



91% made in USA and Brazil

66% made in EU (green)

Source: Renewable Energy Policy Network REN21

Biofuels will become price competitive with oil

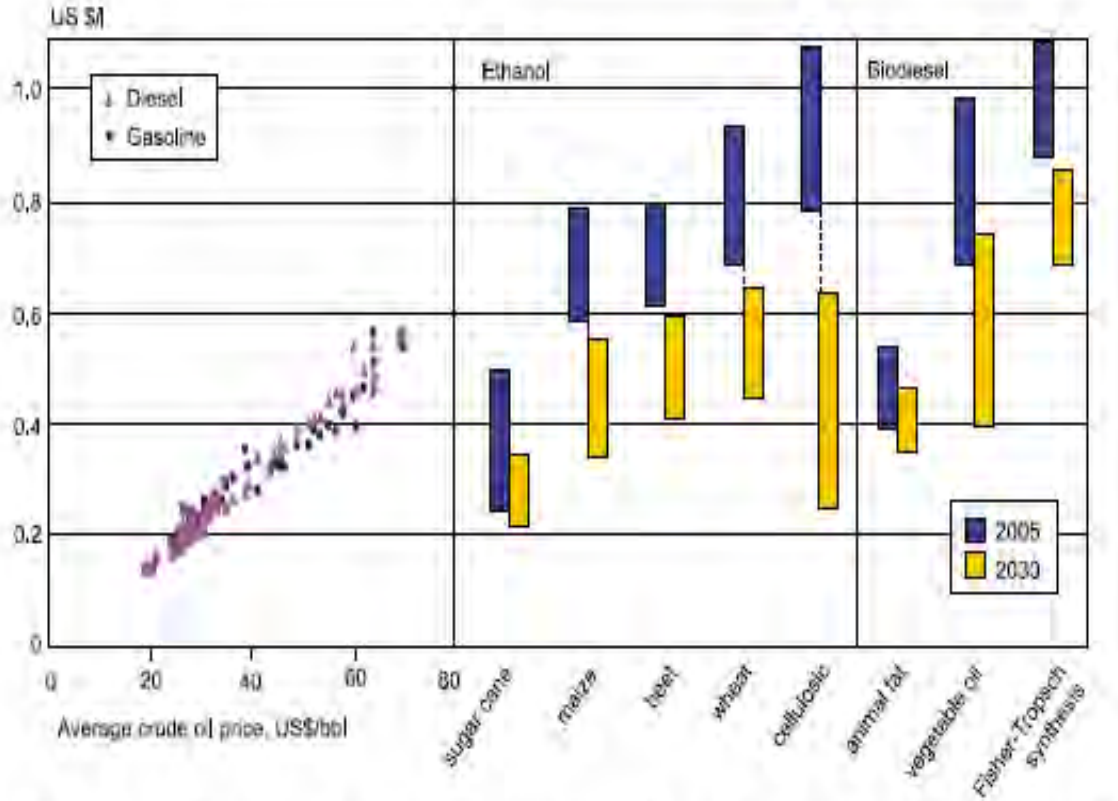
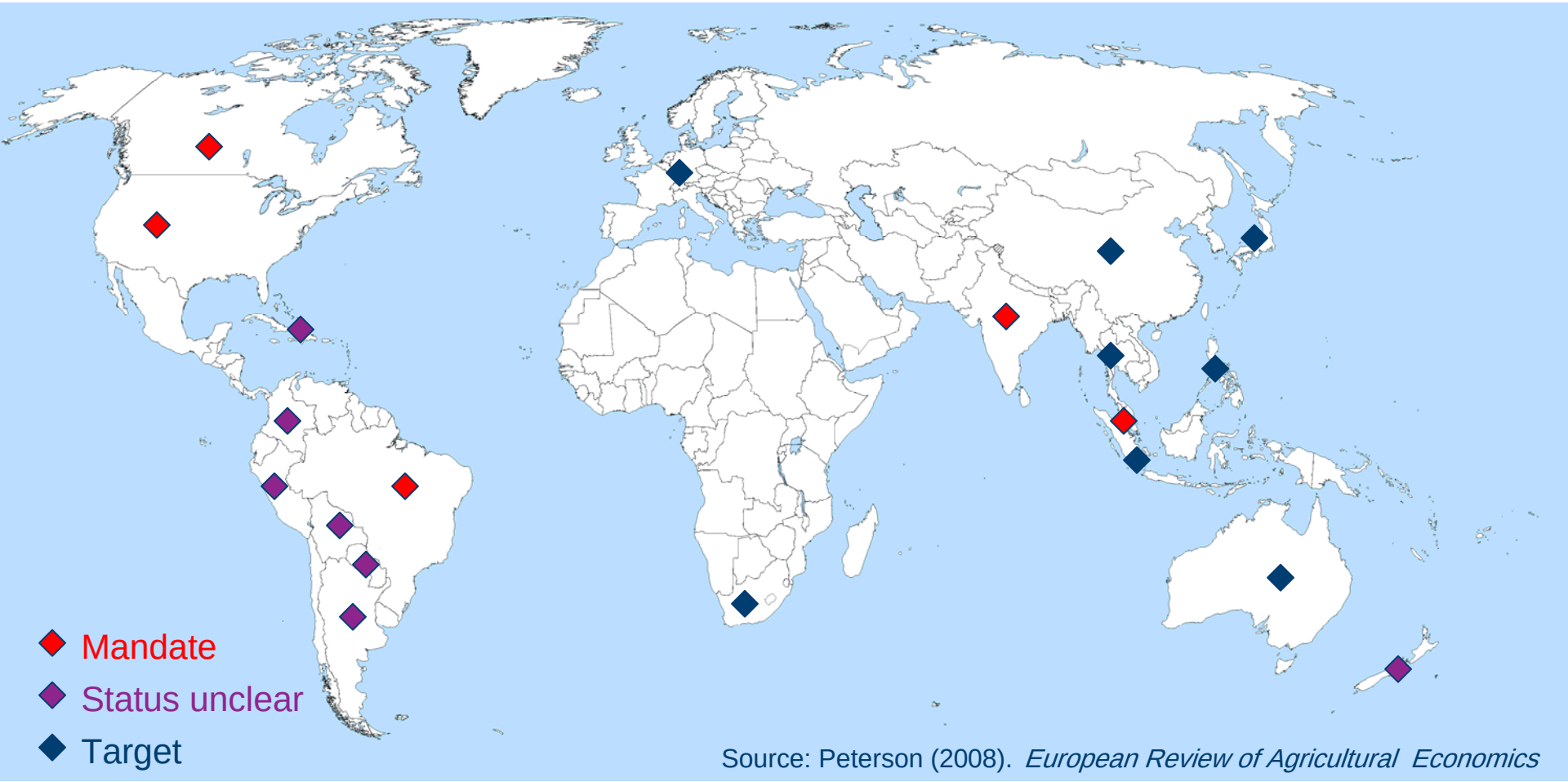


Figure TS.16: Comparison between current and future biofuels production costs versus gasoline and diesel ex-refinery (fob) prices for a range of crude oil prices [Figure 5.9].
Note: prices excl. taxes

Source: IPCC (2007)

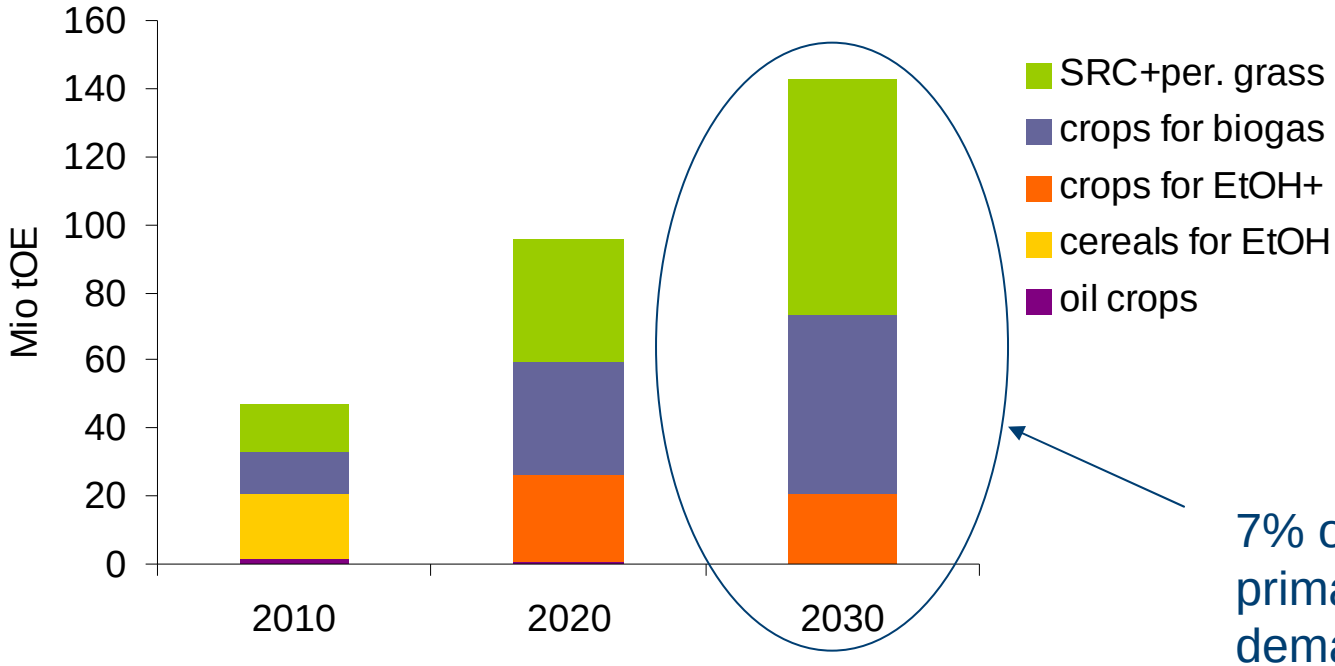
Targets and mandates for biofuels



Source: Peterson (2008). *European Review of Agricultural Economics*

Environmentally compatible bioenergy potential from European agriculture

EU 25



7% of projected primary energy demand for EU in 2030

Source: European Environment Agency (2006)

2. European policy framework

The Renewable Energy Directive

- 20% renewables by 2020
- 10% of transport fuels from renewable sources by 2020
- Mandatory environmental criteria for transport fuels, including at least **35%** greenhouse gas reduction over fossil fuel equivalent

The Fuel Quality Directive

- Emissions from fuels cut by 6% by 2020
- Increased levels of blending with biofuels allowed: up to 10% ethanol in petrol

Renewable Energy Directive (RED)

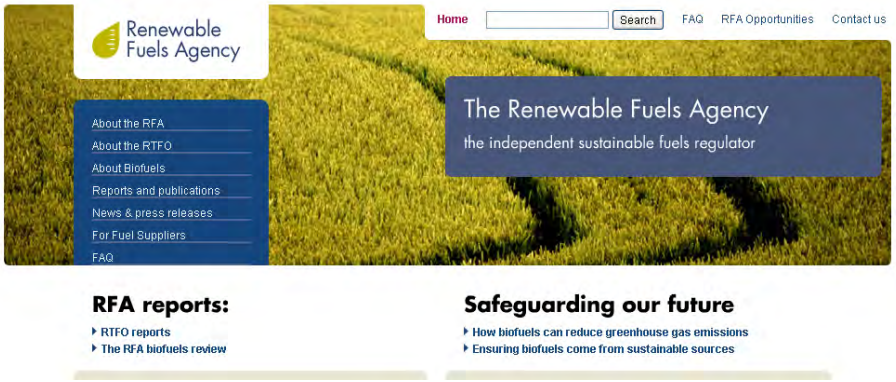
- Transport fuels have to pass ‘sustainability criteria’ to count towards the targets or be eligible for support
- That proportion of renewable electricity used in **electric road vehicles** counts with a multiplier of 2.5
- Second generation fuels, using biomass to liquid technologies from cellulosic feedstocks, count **double** and can be subsidised
- Renewable fuels used in aviation and shipping count towards the 10% target, but total fuel use by aviation and shipping is not included in the total

3. The RED ‘sustainability’ criteria

- Greenhouse gas savings of 35% or more
- Biofuels from land with **high biodiversity value** (primary forest, grassland, designated conservation areas) in January 2008 excluded
- Biofuels from land that had **high carbon stock** (large areas of forest, undrained wetland, peatland) in January 2008 excluded
- Reports every two years from 2012 on social impacts - food prices, land rights
- Bilateral agreements with individual countries allowed

4. The UK approach

- The Renewable Fuels Agency (www.renewablefuelsagency.org)
- RTFO The Renewable Transport Fuels Obligation: biofuels to account for 3.5% of fuel supplied on UK forecourts by 2010, rising to 5% by 2014
- Fuel suppliers *encouraged* to report on source of fuels and environmental credentials



Renewable Fuels Agency targets

Annual supplier target	2008-2009	2009-2010	2010-2011
Percentage of feedstock meeting a Qualifying Environmental Standard	30%	50%	80%
Annual GHG saving of fuel supplied	40%	45%	50%
Data reporting of renewable fuel characteristics	50%	70%	90%

There will be **no penalty** for failing to meet these targets, but the RFA will publish reports of individual supplier performance in a way that is ‘accessible to consumers and could inform their purchasing decisions.’

5. Greenhouse gas accounting

Both the Renewable Energy Directive and the UK's Renewable Transport Fuels Obligation provide:

- Precisely defined greenhouse gas accounting methodology
- Default values for greenhouse gas emissions from different biofuels

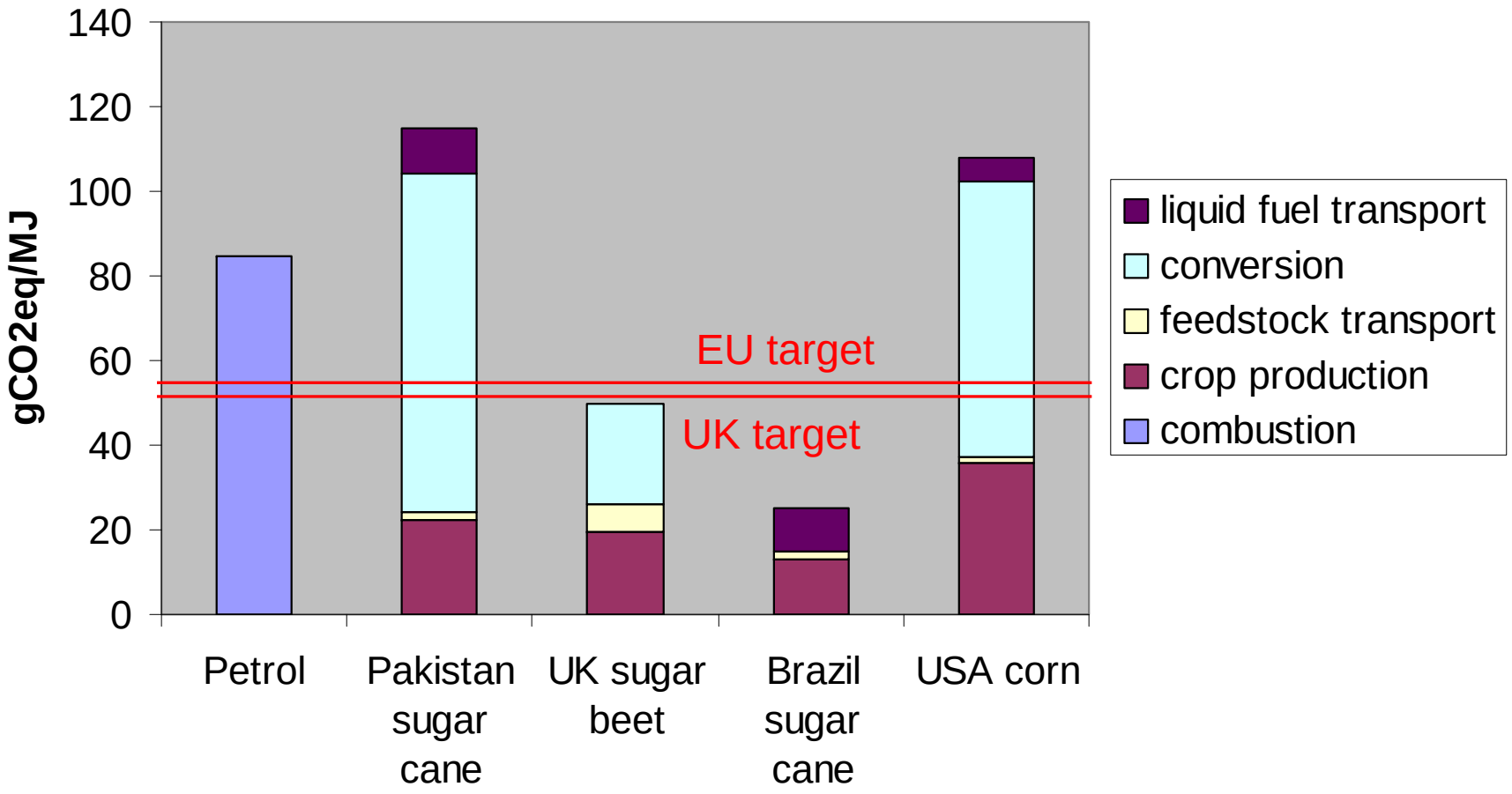
The need for precisely defined methods and default values

The results of Life Cycle Analyses of the same fuel from the same feedstock can vary, according to:

- Assumptions about inputs
- Treatment of by-products
- Treatment of emissions due to land-use change

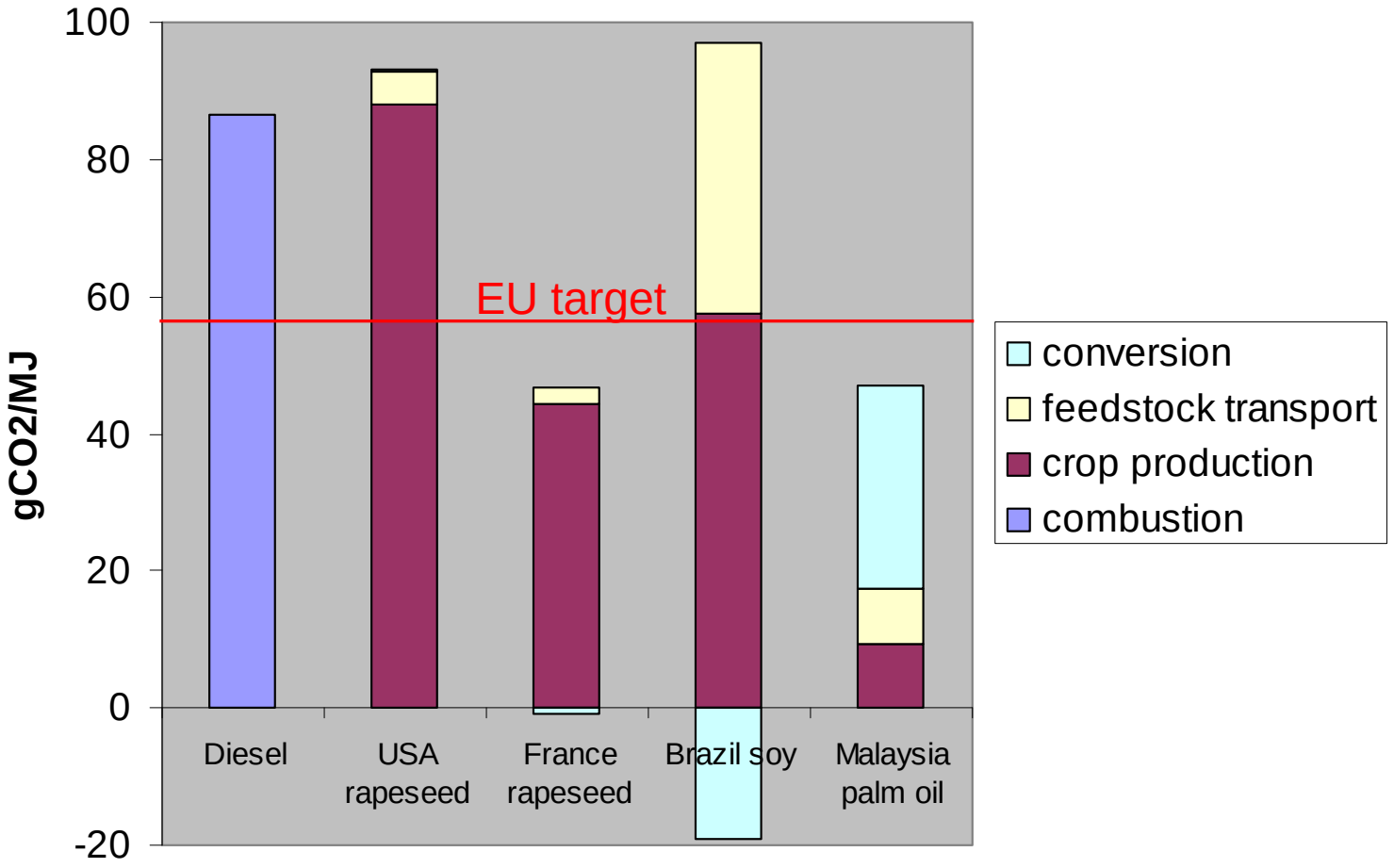
Also, full calculations from every producer or supplier is an unacceptable administrative burden

Default carbon intensities under RTFO: Bioethanol



Source: Renewable Fuels Agency (2009)

Default carbon intensities under RTFO: Biodiesel



Source: Renewable Fuels Agency (2009)

Treatment of land use change

- If land use has changed since November 2005, resultant emissions are added, according to IPCC guideline values
- Default values spread the emissions from land use change over 20 years
- No default land use change – can report ‘unknown’

6. The RFA's sustainability criteria

- A "meta-standard", which other standard sets can be used to meet
- Two sets of standards: Environmental and Social
- Only two standards meet the full RTFO Environmental Meta-standard level – ACCS and Genesis Quality Assurance
- No standards meet the full RTFO Social Meta-standard level
- Qualifying standards are those which meet some of the criteria but not all

The seven sustainability principles

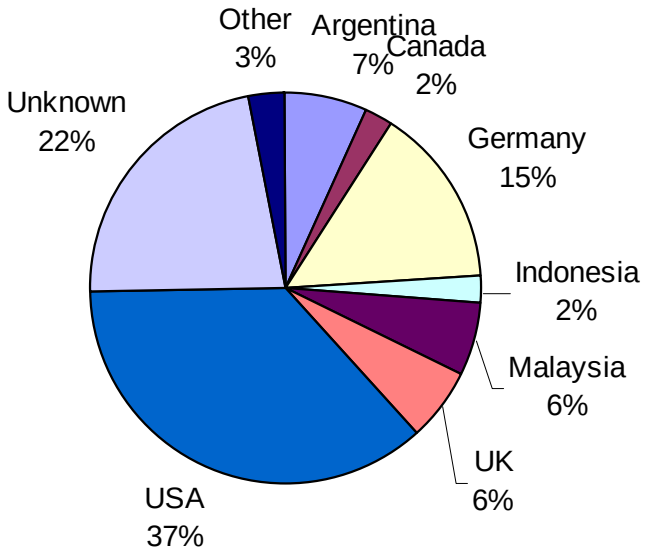
Environmental principles
1. Does not destroy or damage above or below ground **carbon stocks**
2. Does not lead to destruction of or damage to high **biodiversity** areas
3. Does not lead to **soil** degradation
4. Does not lead to contamination or depletion of **water resources**
5. Does not lead to **air** pollution
Social principles
6. Does not adversely affect **worker rights** and working relationships
7. Does not adversely affect existing **land rights** and community relations

RFA's reporting requirements – an example

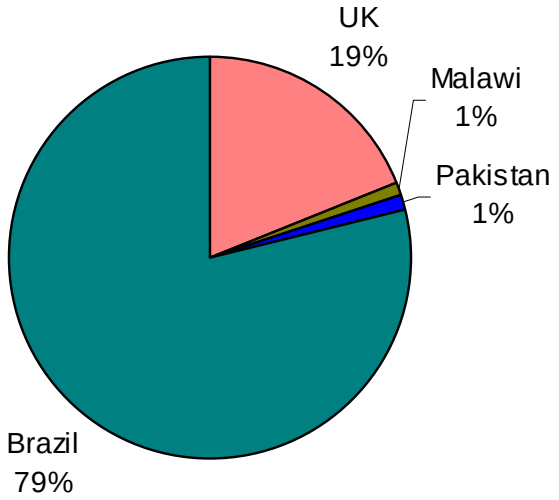
General information					Sustainability information				Carbon information	
Batch	Fuel	No. litres	Feed stock	Origin	Standard	Env level	Soc level	Land use Nov 05	gCO_2 /MJ	Accuracy
3301	Ethanol	250,000	Sugar beet	UK	ACCS	RTFO	-	Crop	35	5
3302	Ethanol	100,000	Sugar cane	Brazil	Meta-standard	RTFO	RTFO	Crop	25	2
3305	Ethanol	500,000	Unknown	Unknown	Unknown	-	-	Unknown	115	0
3303	Diesel	500,000	Soy	Argentina	Basel	QS	QS	Grass	166	2

Year 1 of the RTFO: where UK biofuels come from

Biodiesel (84%)



Bioethanol (16%)

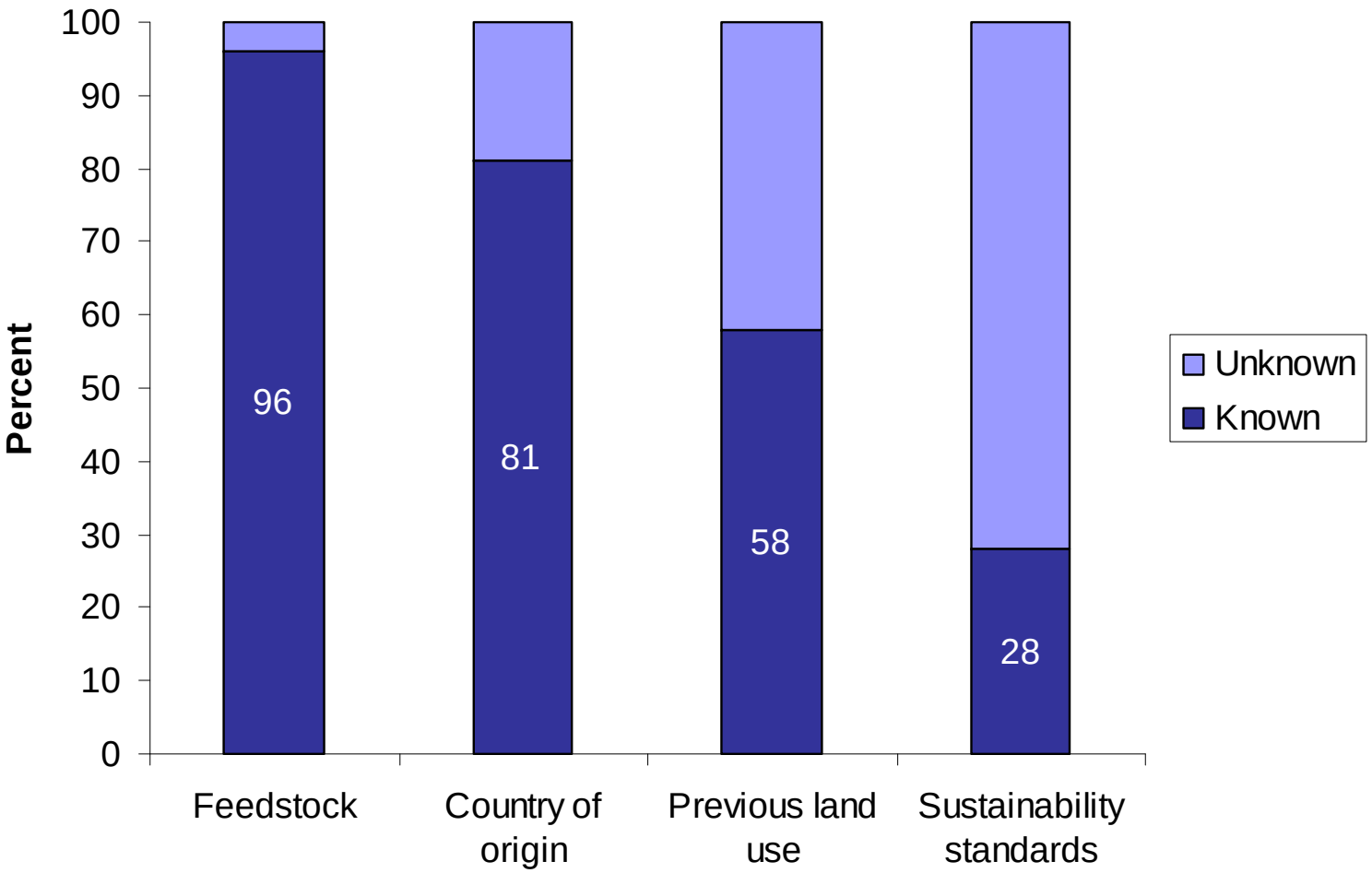


In total, 1087 million litres of biofuel were sold between April 08 and February 09.

This is **2.7% of total road transport fuel**

Source: RFA 2009

Data capture on UK biofuels April 08 – Feb 09



Source: RFA 2009

Greenhouse gas savings of 46% were achieved

What's missing?

- Indirect land use change
- Land freed by substituted by products (feed)
- Indirect effects on the price of food

The UK Government commissioned the Gallagher Review, in 2007, to study these effects…

It concluded they could be large, and resulted in the targets for renewable transport fuel being reduced

7. Comparison between UK and EU approaches

- The default emission values are lower in the Renewable Energy Directive (RED)
- Environmental criteria and reporting requirements are weaker in the RED
- Threshold year for direct land use change is much more recent in the RED
- The Renewable Transport Fuels Obligation (RTFO) aims for higher greenhouse savings
- BUT sustainability criteria are not mandatory in the RTFO

8. Why should farmers care?

- Fuel suppliers do not HAVE to report on greenhouse gas emissions
- When the Renewable Energy Directive comes in, it will become necessary, for the fuel to count towards biofuel targets
- Fuel suppliers will be seeking biomass sources with a good audit trail

WHEN WILL THIS HAPPEN?

Countries have 18 months (from April 09) to draw up implementation plans. In the UK, the Department for Transport is likely to consult on how to implement the sustainability reporting rules for transport fuel.

Chains of custody for biofuels

- To validate accuracy of Carbon and Sustainability information, a **chain of custody** is needed
- Each company in the chain of custody will need written procedures, and a person with responsibility for adherence to the procedures
- Of certification schemes applicable to cash crops, only the Roundtable on Sustainable Palm Oil (RSPO) and the Sustainable Agriculture Network/Rainforest Alliance currently have operational chains of custody
- Fuel suppliers will set up chains of custody, taking **mass balance** as the default approach
- Data requirements from farmers: fertiliser use, land use, quality standard certificates, production quantities

Concluding remarks

- Biofuels are here to stay
- For sale to Europe, there is an incentive to keep greenhouse gas emissions low and avoid direct land use change
- Currently only transport fuels are covered by sustainability requirements, but this will change
- Second generation biofuels are strongly encouraged

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