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## RFA Monthly Report 11: 15 April 2008 - 14 March 2009<sup>1</sup>

### 1. Introduction

To encourage suppliers to source sustainable biofuels, the RFA requires fuel suppliers claiming Renewable Transport Fuel Certificates to submit monthly reports on the lifecycle greenhouse gas (GHG) saving and the sustainability of the biofuels they supply.

Reporting is also seen by the Government as an essential 'stepping stone' towards a mandatory assurance scheme.

This report provides information on the carbon and sustainability performance of renewable fuels supplied under the RTFO. The data is derived from the monthly reports on biofuels provided by individual fuel suppliers. At the end of the reporting year fuel suppliers are required to provide an independent verifier's opinion on their information, and this verified information will be available in the RFA's annual report.

The carbon and sustainability data covers the *direct* impacts arising from biofuel cultivation that are potentially within the influence of companies sourcing or producing biofuels through effective supply chain management. The RFA will separately monitor the potential *indirect* impacts of biofuel production such as indirect land-use change or changes to food and other commodity prices (e.g. *The Gallagher Review of the indirect effects of biofuels production* which was published on 8 July 2008).

## **2. Sustainability and the RTFO meta-standard**

The RTFO is built around seven sustainability principles; five environmental and two social. These seven principles have been used to define the RTFO sustainability meta-standard. A meta-standard approach enables the use of existing certification schemes to meet the standard. Existing schemes, such as the UK's Assured Combinable Crops Scheme, are assessed against the RTFO principles.

No schemes currently meet all of the environmental and social principles; although two schemes meet all of the environmental principles. However, any scheme that meets an adequate number of criteria is considered a 'qualifying standard', and fuel companies can report these to the RFA. Fuels from wastes (e.g. used cooking oil and tallow<sup>2</sup>) are also automatically considered to be sustainable to the qualifying level. Suppliers are also permitted to set up their own auditing procedures to demonstrate that feedstocks meet the RTFO meta-standard. Other standards can also be reported to the RFA and count towards the data capture target; these include standards that have not yet been benchmarked against the RTFO meta-standard, or standards that have been benchmarked, but do not meet sufficient criteria to be awarded the qualifying level status.

While there are currently several qualifying standards for the RTFO, these are mostly either under development or only newly established; the ACCS is the only well established certification scheme, and is only applicable to UK crops. This currently limits the ability of fuel suppliers to source certifiably sustainable feedstocks. Also, the market is relatively new, and the expectation is that it will take time to develop operational procedures that will enable suppliers to track information about sustainability through their supply chains. It is intended that by creating a market for sustainable crops, the RTFO will support the development and expansion of these certification schemes, and that suppliers will be increasingly able to source their feedstocks sustainably.

### 3. Content of this report

The information in this report includes:

- volumes of fuel by fuel type (e.g. biodiesel, bioethanol);
- volumes of fuel by feedstock (e.g. used cooking oil, soy);
- volumes of fuel by country of origin (e.g. UK, Brazil);
- volumes of fuel meeting sustainability standards;
- lifecycle greenhouse gas savings of fuels.

The information is provided in four sets of Excel sheets:

#### RTFO graphs

Illustrates key data graphically and includes: volumes and proportions of fuel by fuel type, feedstock, and country of origin; data on the sustainability of the biofuels supplied; and percentage data capture for each category.

#### RTFO trends

Presents data on RTFO performance against the three Government targets.

#### RTFO summary data

Provides five tables with summaries of all the road transport biofuel supplied to the UK for each fuel type, feedstock, country of origin, and previous land-use.

#### RTFO detailed data

Table 6 provides more detailed data broken down by fuel type, feedstock, country of origin and previous land-use. So, for example, data is provided on the volumes of fuel and the C&S information of bioethanol from Brazilian sugar cane, or biodiesel obtained from oilseed rape grown in the UK on cropland, and also meeting a Qualifying Standard.

#### 4. Provisional data

This data is based on information submitted monthly to the RFA by fuel suppliers, but the final verification of this data occurs annually (by 28 September each year in respect of the previous financial year's data). Revisions to the data may occur at any point up until that time. The RFA will publish a comprehensive end of year dataset using data that has been independently verified by 31 January 2010.

Each Monthly Report released by the RFA will contain data from the reporting year<sup>1</sup> to date on biofuels entering the UK market from those companies that are registered with the RFA.

The exact timing of the months that the data covers is different for major and minor fuel suppliers, due to the way they report data on volumes of fuel to HM Revenue and Customs (HMRC):

- Large fuel companies (typically predominately fossil fuel suppliers) report to HMRC on a 15<sup>th</sup> to 14<sup>th</sup> of the month basis.
- Smaller fuel companies (typically biofuel suppliers) report by calendar month or quarter.

#### 5. C&S reporting targets

The Government has set targets for three key aspects of the reporting scheme. The targets are not mandatory (and there is no penalty for failing to meet them), but illustrate the level of performance which the Government expects from fuel suppliers over the obligation year. The targets take market factors into account and therefore increase over time with the expectation that the biofuel market will also expand. The Government has said that the targets will be subject to review in the light of suppliers' performance and other developments.

<i>Annual Supplier Target</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>
<i>Percentage of feedstock meeting a Qualifying Environmental Standard</i>	30%	50%	80%
<i>Annual GHG saving of fuel supplied</i>	40%	45%	50%
<i>Data reporting of renewable fuel characteristics</i>	50%	70%	90%

The RFA expects, and Government targets recognise, the need for continuous improvement so that by 2010 comprehensive sustainability data is provided for almost all biofuels supplied to the UK. The RFA nevertheless expects companies to report to the best of their abilities from the start of the scheme.

## 6. RTFO misdrafting

In months one to five, we reported on the percentage of biofuels in the total road transport fuel supply. Due to the identification that the RTFO Order was misdrafted, our reporting instructions for month six were revised and we no longer have data on the total supply of fossil road transport fuel, and are hence unable to report the percentage of biofuel.

Similarly, due to the reinterpretation of the Order after the misdrafting was identified, we need additional information from companies to identify whether they are actually obligated. We are therefore no longer referring to 'obligated' and 'non-obligated' companies – instead we are referring to companies that have in the past reported the supply of both fossil fuel and biofuel to us as 'fossil fuel companies' and companies that have reported only the supply of biofuel as 'biofuel companies'.

[Additional information about the misdrafting of the RTFO Order is available from our website.](#)

### Footnotes

<sup>1</sup> The reporting or obligation year runs from 15 April 2008 to 14 April 2009. This report contains data from 15 Apr 2008 - 14 Mar 2009 for large fuel companies, and 15 Apr 2008 - 28 Feb 2009 for those smaller companies that report by calendar month or quarterly.

<sup>2</sup> Recent research has called into question the overall environmental benefits of using tallow as a feedstock for biofuels: <http://www.dft.gov.uk/pgr/roads/environment/rtfo/tallow/tallowfinalresport.pdf>

**RFA Monthly Report 11: 15 April 2008 - 14 March 2009**  
**Executive Summary**

This report covers the supply of biofuels under the Renewable Transport Fuel Obligation<sup>1</sup> from 15 April 2008 to 14 March 2009.

The headline figures<sup>2</sup> are:

1158 million litres of biofuel have been supplied under the RTFO. This is approximately 2.7% of total road transport fuel.<sup>3</sup> More biodiesel (84%) has been supplied than bioethanol (16%).

The majority of feedstock has been imported. The feedstock is known for 96% of fuel supplied. Both the feedstock and country of origin are known for 80%.

The most widely reported source of biodiesel was American soy (26% of biodiesel supplied). The most widely reported source of bioethanol was Brazilian sugarcane (80% of bioethanol supplied).

Over the period, 19% of biofuels met an environmental standard, compared to a target of 30%<sup>4</sup>.

99% of the fuel reported as coming from UK feedstocks met environmental sustainability standards.

Greenhouse gas savings of 46% were achieved against a Government target of 40%. This figure excludes the emissions from indirect land-use changes considered in the agency's 'Gallagher Review'.

## **RFA Monthly Report 11: 15 April 2008 - 14 March 2009**

### **Executive Summary**

#### **Notes**

- <sup>1.</sup> The RTFO applies to road transport across the whole of the UK. Refiners, importers and any others who supply more than 450,000 litres of relevant hydrocarbon oil for road transport annually to the UK market are obligated by it.
- <sup>2.</sup> Data comes from monthly reports submitted by fuel suppliers to the RFA. The RFA performs checks on the data, which is also subject to an annual verification process by independent auditors. The RFA will publish a final, fully verified dataset at the end of year.
- <sup>3.</sup> In months one to five, we reported on the percentage of biofuels in the total road transport fuel supply. Due to the identification that the RTFO Order was misdrafted, our reporting instructions for month six were revised and we no longer have data on the total supply of fossil road transport fuel. We are hence unable to report the percentage of biofuel from our data. The percentage figure supplied is derived from HMRC data for May 2008 to March 2009. Note that this period does not tally completely with our data, but provides an approximation.

[Additional information about the misdrafting of the RTFO Order is available from our website.](#)

- <sup>4.</sup> 30% of feedstocks should meet environmental sustainability standards in the year 2008-9. The ability of suppliers to source certifiably sustainable fuels is currently limited, as the British ACCS scheme is the only qualifying environmental standard that is well established. Certified sustainable feedstock is expected to become increasingly available over time, as feedstock standards develop in response to the demand created by the RTFO and growing concern about the sustainability of agricultural commodities more widely.

## RFA Monthly Report 11: 15 April 2008 - 14 March 2009

### Glossary

#### **Obligated company**

- An obligated company is one that supplies > 450 000 litres/year of relevant hydrocarbon oil road transport fuel. Any fossil fuel that is supplied blended with biofuel prior to the duty point is excluded.

[Additional information about the misdrafting of the RTFO Order is available from our website.](#)

- Obligated suppliers must either:
  - supply biofuels; or
  - pay into a buy-out fund; or
  - purchase certificates from other companies supplying biofuels; or
  - a combination of any of the above.
- Obligated companies supply > 95% of the biofuels in the UK market.

#### **Non-obligated company**

- Non-obligated companies are those that supply < 450 000 litres/year of relevant hydrocarbon oil road transport fuel, or only supply biofuels.
- Non-obligated companies are not required to register with us, but can choose to do so and gain one Renewable Transport Fuel Certificate (RTFC) for every litre of biofuel supplied.

#### **Sustainability standards**

- Sustainability assurance schemes are divided into Environmental and Social Standards and these are split into three levels:
  1. RTFO sustainable biofuel meta-standard (RTFO) - this is a higher standard than most existing sustainability standards and covers seven key environmental and social principles.
  2. Qualifying Standards (QS) - meet the majority of the environmental and/or social criteria defined under the RTFO meta-standard.
  3. Other Standards - these have either not yet been benchmarked, or have been benchmarked against the RTFO meta-standard, but do not meet sufficient criteria to be awarded QS status.
  4. None/unknown - for where the feedstock was not certified against a standard, or the data is unavailable.

## **RFA Monthly Report 11: 15 April 2008 - 14 March 2009**

### **Glossary**

- Suppliers can report a Benchmarked or Qualifying Standard and conduct supplementary audits to meet a QS or the RTFO meta-Standard, respectively.
- Suppliers producing biofuels from by-products have no or little control over how the source feedstocks were produced. Therefore, in recognition of the use of a waste for these biofuels they are automatically awarded a QS.

#### **Previous land-use**

- This is the use of the land on which the feedstock crop was grown prior to 30 Nov 2005. There are five categories:
  1. unknown
  2. cropland
  3. grassland - agricultural use
  4. grassland - non-agricultural use
  5. forestland.
- By-products (e.g. used cooking oil and tallow) do not require any additional land as these are waste products from other processes.
- The previous land-use affects greenhouse gas emissions due to release of carbon stored in the soil and plants when the land is cleared and ploughed up for biofuel crops.

#### **Feedstocks**

BG - biogas  
Ch - cheese by-product  
Mol - molasses  
msw - municipal solid waste  
UCO - used cooking oil  
SF - sunflower  
Sul - sulphite

**RFA Monthly Report 11: 15 April 2008 - 14 March 2009**  
**Glossary**

**Carbon Intensity**

- Carbon intensity is a measure of the greenhouse gas (GHG) emissions of the fuel chain from 'field-to-wheel'.
- Different GHGs have different potencies (some have a greater contribution to global warming than others).
- To account for this, all GHGs are expressed in terms of their strength relative to carbon dioxide, called carbon dioxide equivalent (CO<sub>2</sub>e).

**Greenhouse gas emissions**

- Greenhouse gas (GHG) emissions of different biofuels can vary significantly depending on the system of cultivation, processing, and transportation of feedstock.
- The data collected takes into account GHG emissions of the fuel chain from the farm to the forecourt incorporating data on feedstock, country of origin and land-use change.
- GHG saving refers to the amount of GHGs that have not been emitted to the atmosphere due to replacing petrol and diesel with bioethanol and biodiesel or biogas, respectively. A negative value means that more GHGs have been emitted by using the biofuel than if the fossil fuel was used.

**Accuracy level**

- Accuracy level is a measure of the amount of data provided by the supplier on a particular batch of biofuels.
- This data is used for calculation of the greenhouse gas emissions of the fuel chain.
- It ranges from 0 to 5 where 5 is the highest:
  - 0 - unknown feedstock or country of origin
  - 1 - known feedstock or country of origin
  - 2 - known feedstock AND country of origin
  - 3 - data input based on RFA-defined defaults
  - 4 - data input based on industry-defined defaults
  - 5 - 'real' data input to the fuel chain e.g. information on fertiliser inputs and crop yield of the source feedstock.

## RFA Monthly Report 11: 15 April 2008 - 14 March 2009

### Glossary

#### C&S reporting targets

- The Government has set targets for three key aspects of the reporting scheme. The targets are not mandatory (and there is no penalty for failing to meet them), but illustrate the level of performance which the Government expects from fuel suppliers. The Government has said that the targets will be subject to review in the light of suppliers' performance and other developments.

<i>Annual Supplier Target</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>
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- The data reporting of renewable fuel characteristics target refers to the amount of data provided by transport fuel suppliers as opposed to reporting 'unknown' against the four sustainability components:

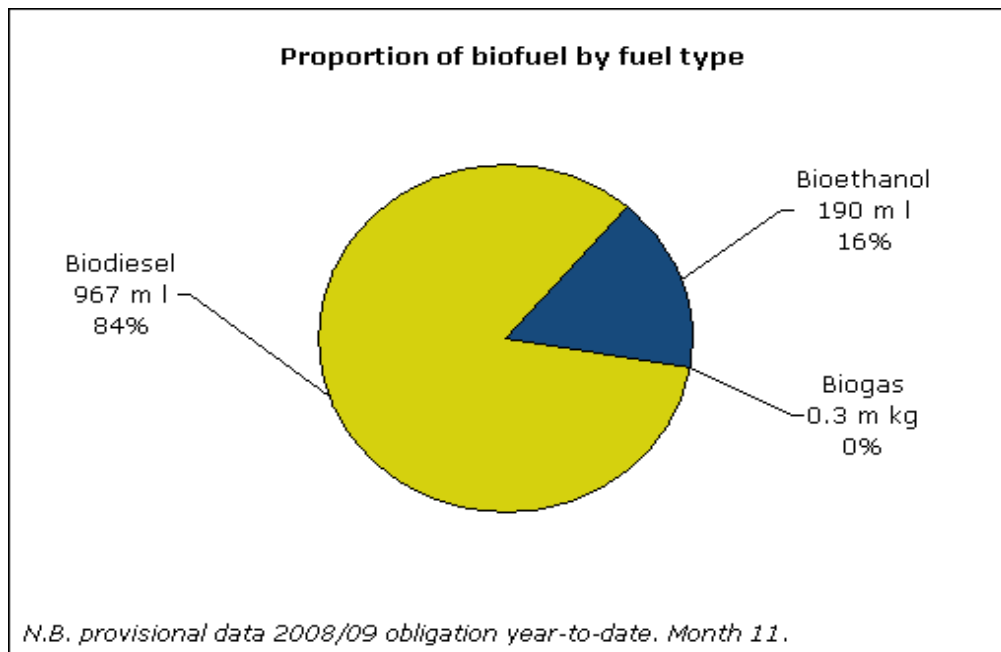
1. biofuel feedstock
2. feedstock country of origin
3. sustainability standard
4. land-use on 30 November 2005.

- Whilst 'unknown' reporting is permitted, suppliers will be encouraged to identify and report accurate information about the feedstocks used. Where 'unknown' or 'none' is reported this does not count towards the data capture target.

- Where a by-product has been used as the feedstock, reporting 'by-product' for the sustainability information fields will be counted as a completed report.

- Reporting a non-Qualifying Standard is also counted as a completed data field for the 'standard' field.

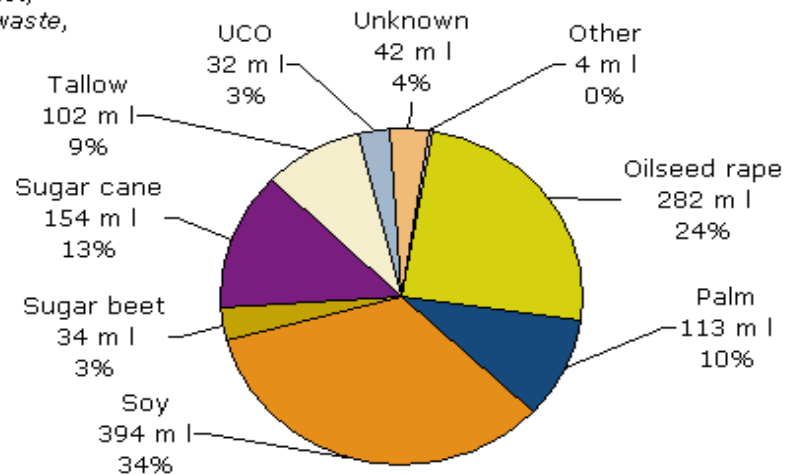
### Volumes and proportions by fuel type



## Proportions by feedstock

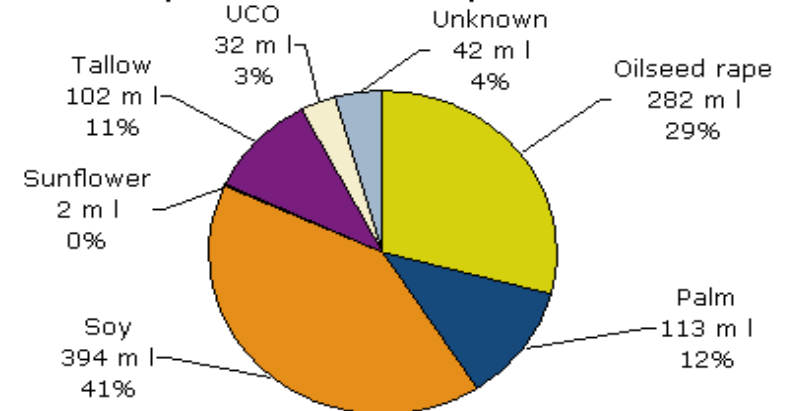
'Other' includes  
cheese by-product,  
municipal solid waste,  
molasses,  
sulphite &  
sunflower

### Proportion of biofuel by feedstock



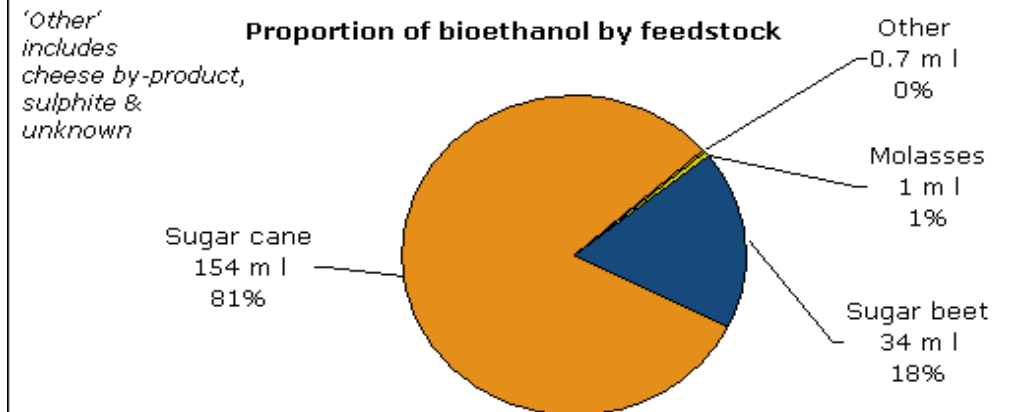
*N.B. provisional data 2008/09 obligation year-to-date. Month 11.*

### Proportion of biodiesel by feedstock



*N.B. provisional data 2008/09 obligation year-to-date. Month 11.*

### Proportion of bioethanol by feedstock

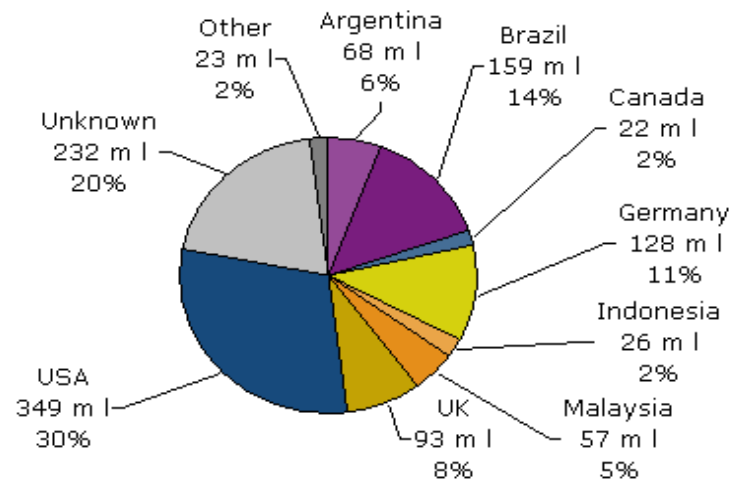


*N.B. provisional data 2008/09 obligation year-to-date. Month 11.*

## Proportions by country

'Other' includes Belgium, Denmark, Finland, France, Ireland, Malawi, Netherlands, Pakistan, Sweden & Ukraine

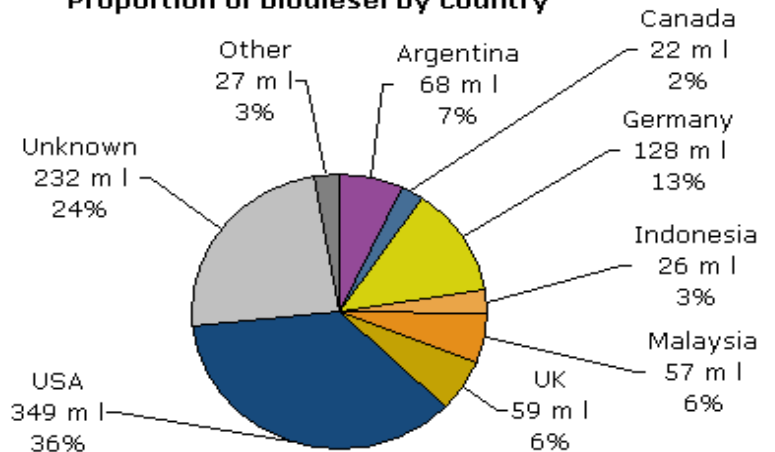
**Proportion of biofuel by country**



N.B. provisional data 2008/09 obligation year-to-date. Month 11.

'Other' includes Belgium, Brazil, Denmark, Finland, France, Ireland, Netherlands, Sweden & Ukraine

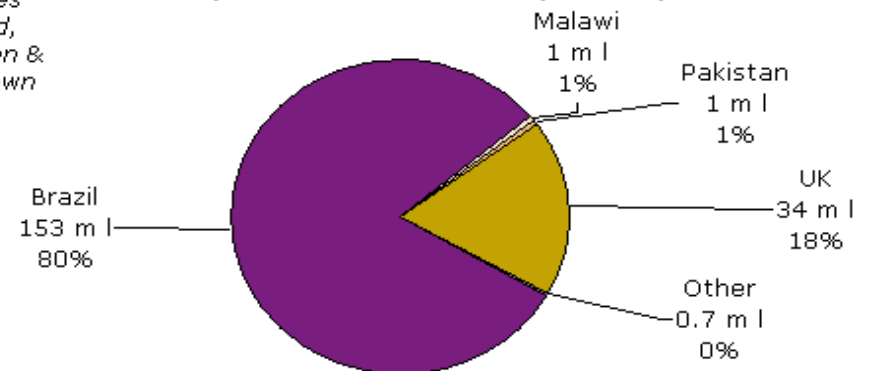
**Proportion of biodiesel by country**



N.B. provisional data 2008/09 obligation year-to-date. Month 11.

'Other' includes Ireland, Sweden & unknown

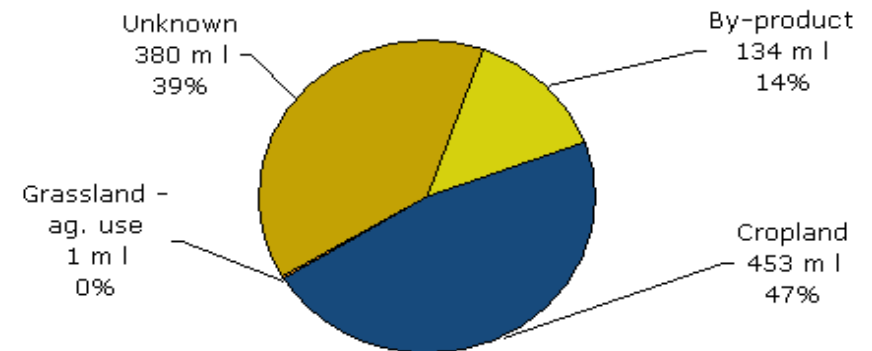
**Proportion of bioethanol by country**



N.B. provisional data 2008/09 obligation year-to-date. Month 11.

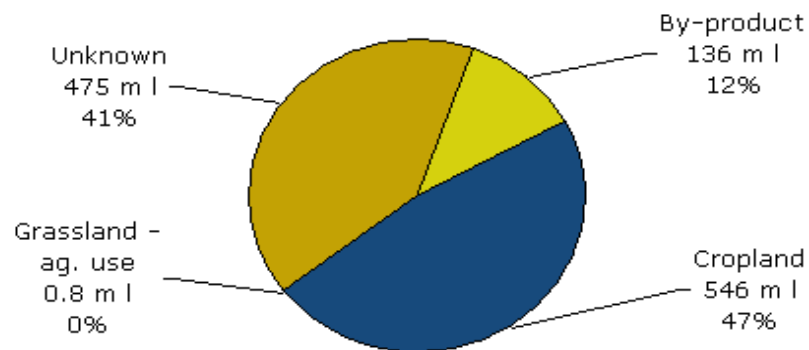
## Proportions by previous land-use

**Proportion of biodiesel by previous land-use**



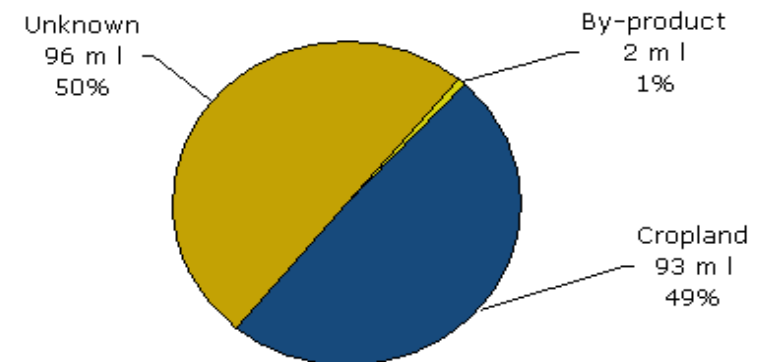
*N.B. provisional data 2008/09 obligation year-to-date. Month 11.*

**Proportion of biofuel by previous land-use**



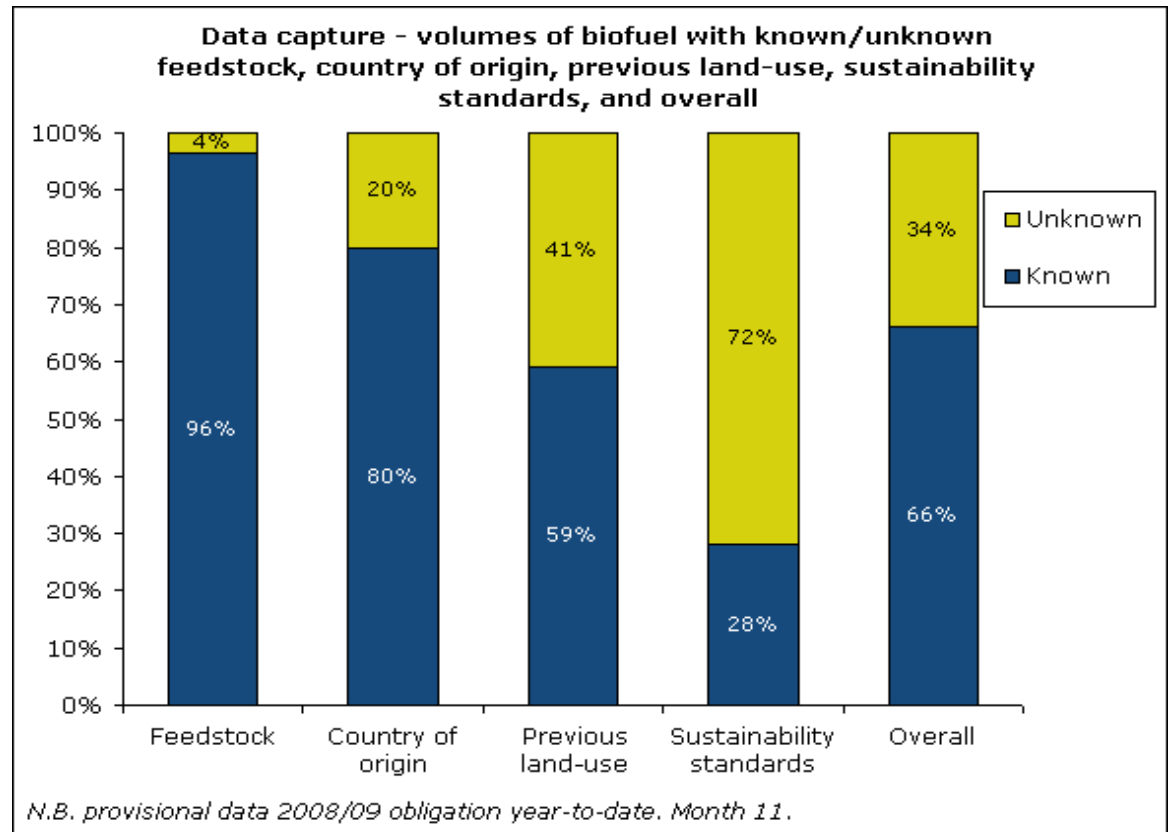
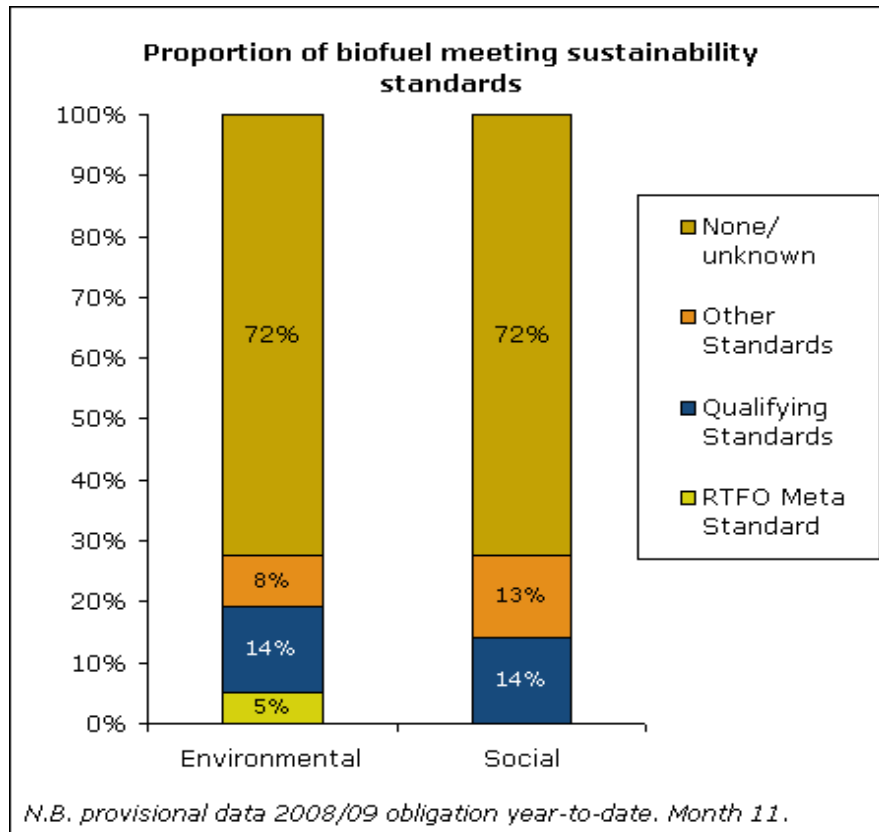
*N.B. provisional data 2008/09 obligation year-to-date. Month 11.*

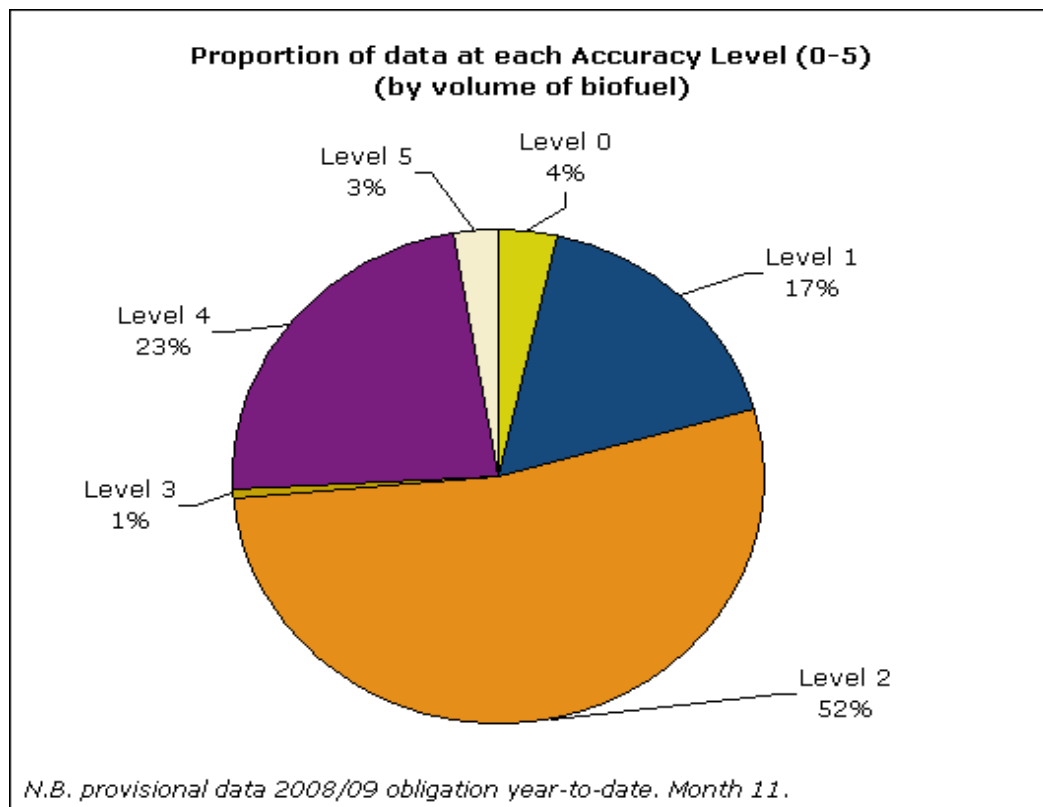
**Proportion of bioethanol by previous land-use**



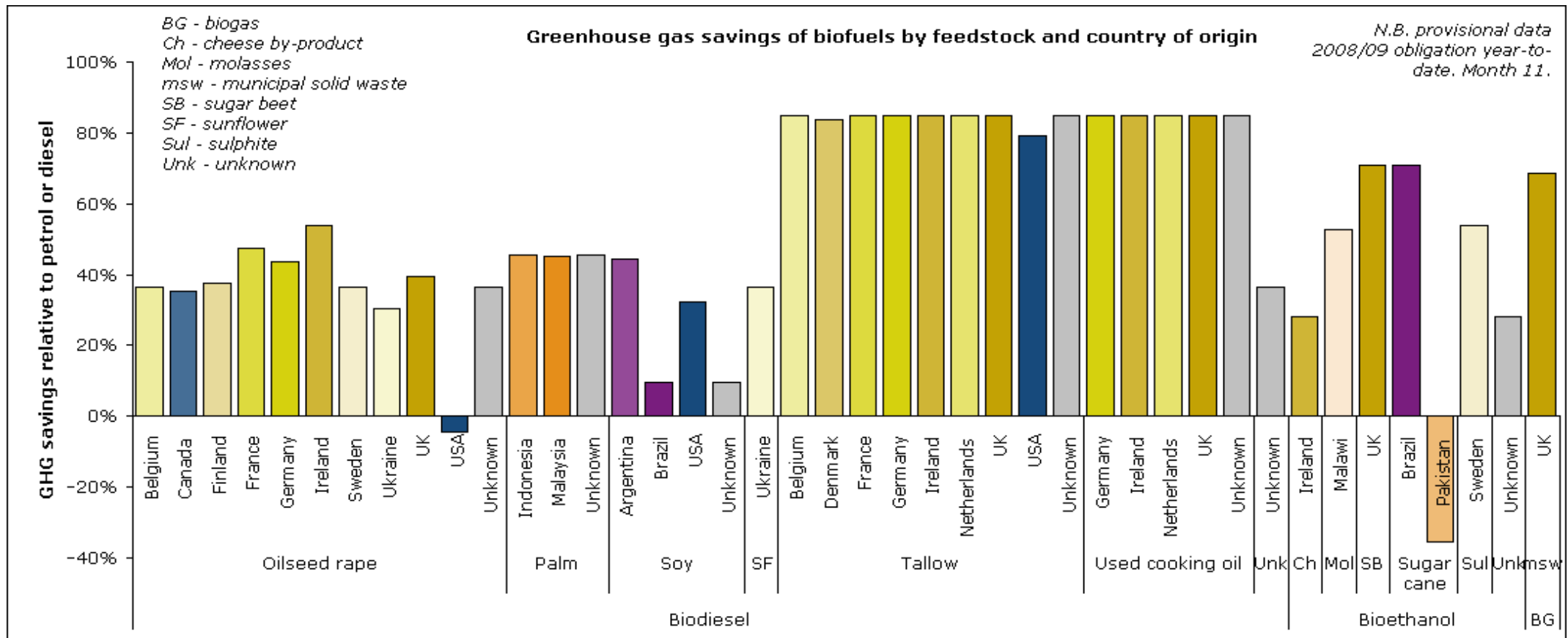
*N.B. provisional data 2008/09 obligation year-to-date. Month 11.*

## Sustainability, data-capture and accuracy

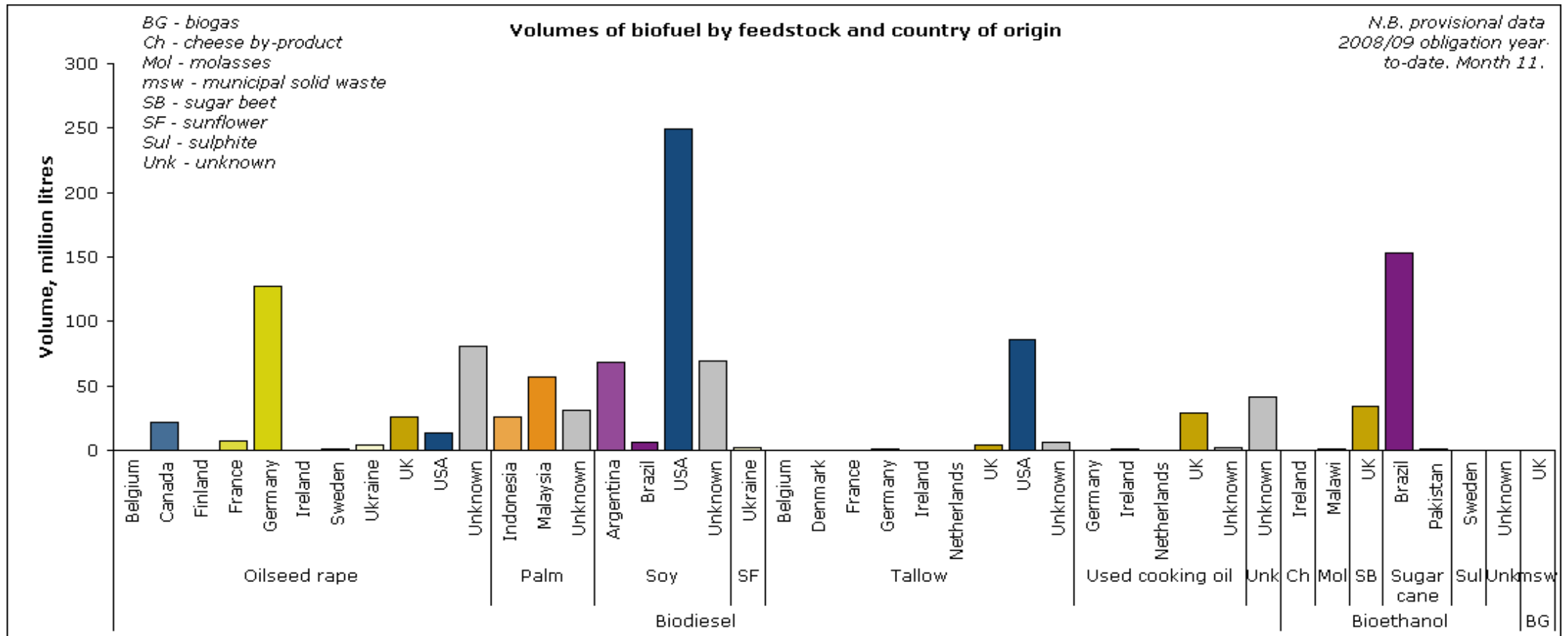




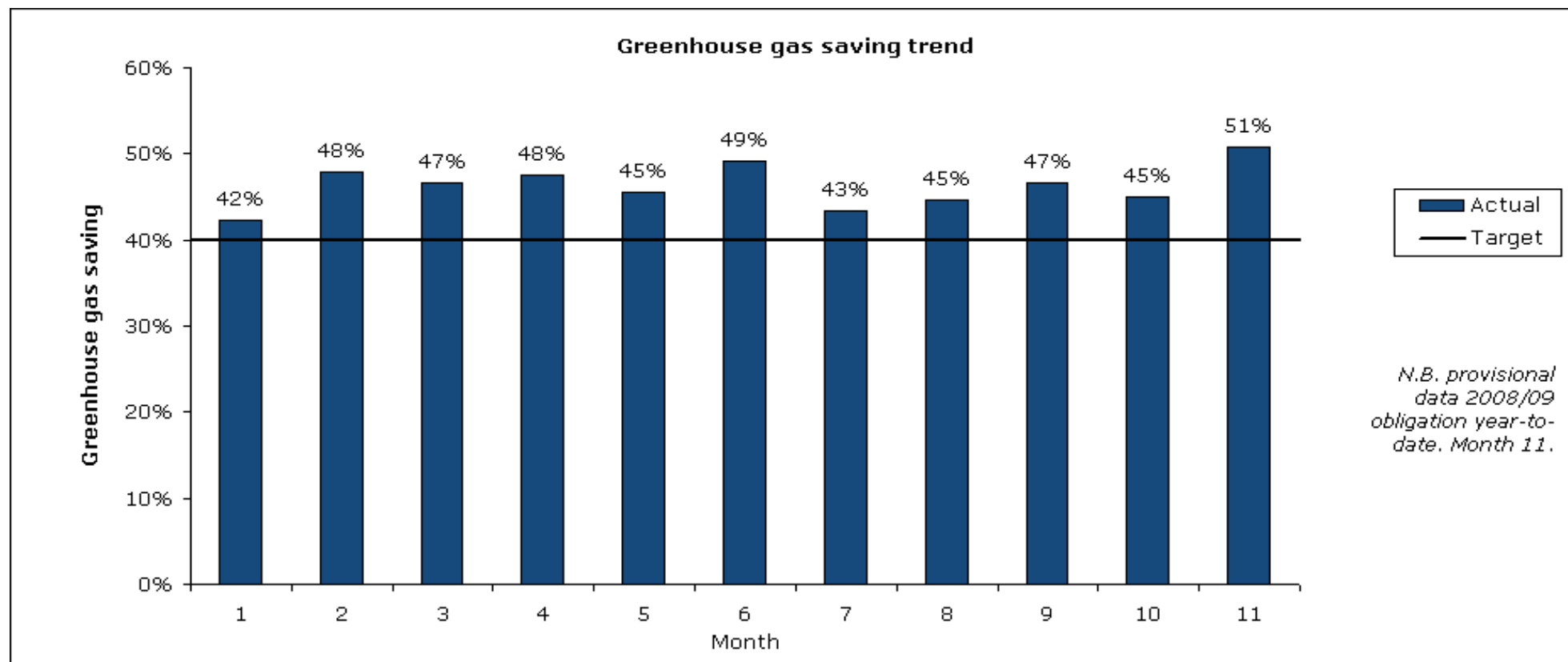
## Greenhouse gas savings



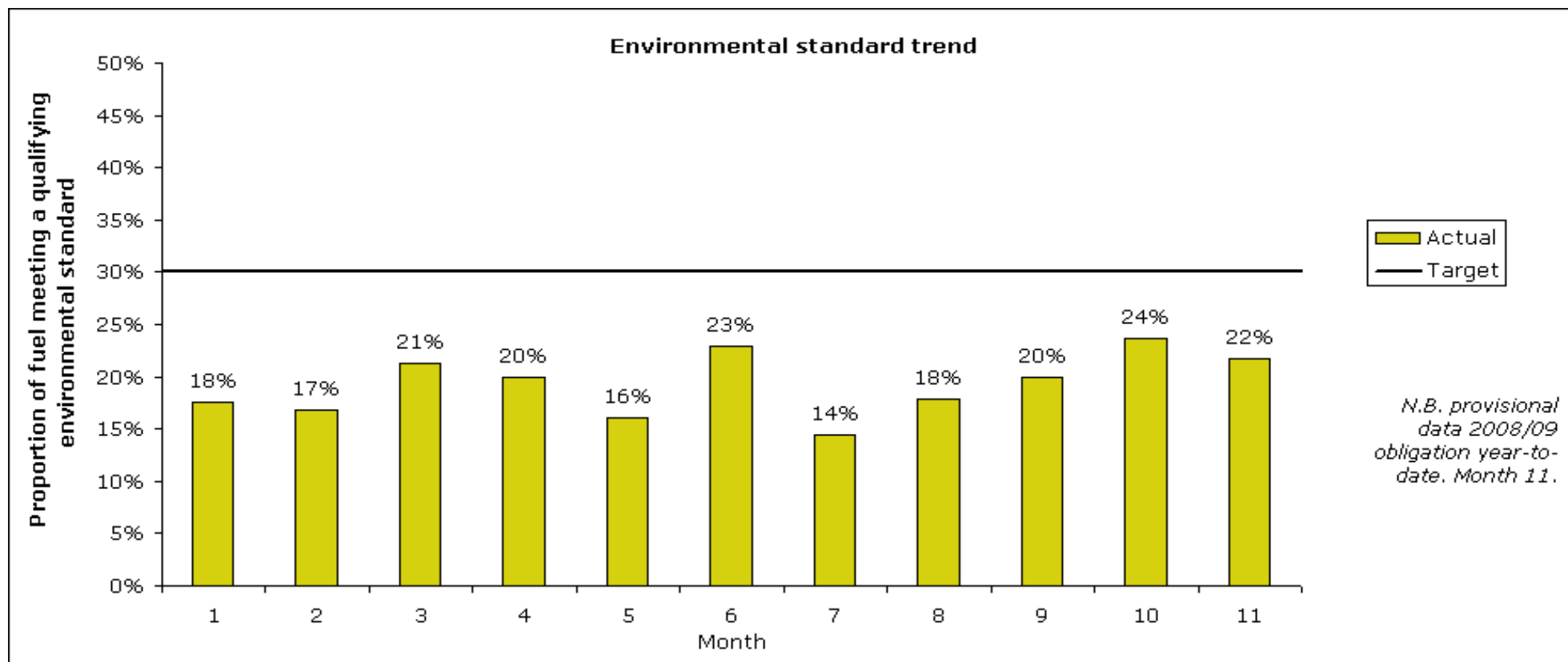
## Volume by feedstock and country



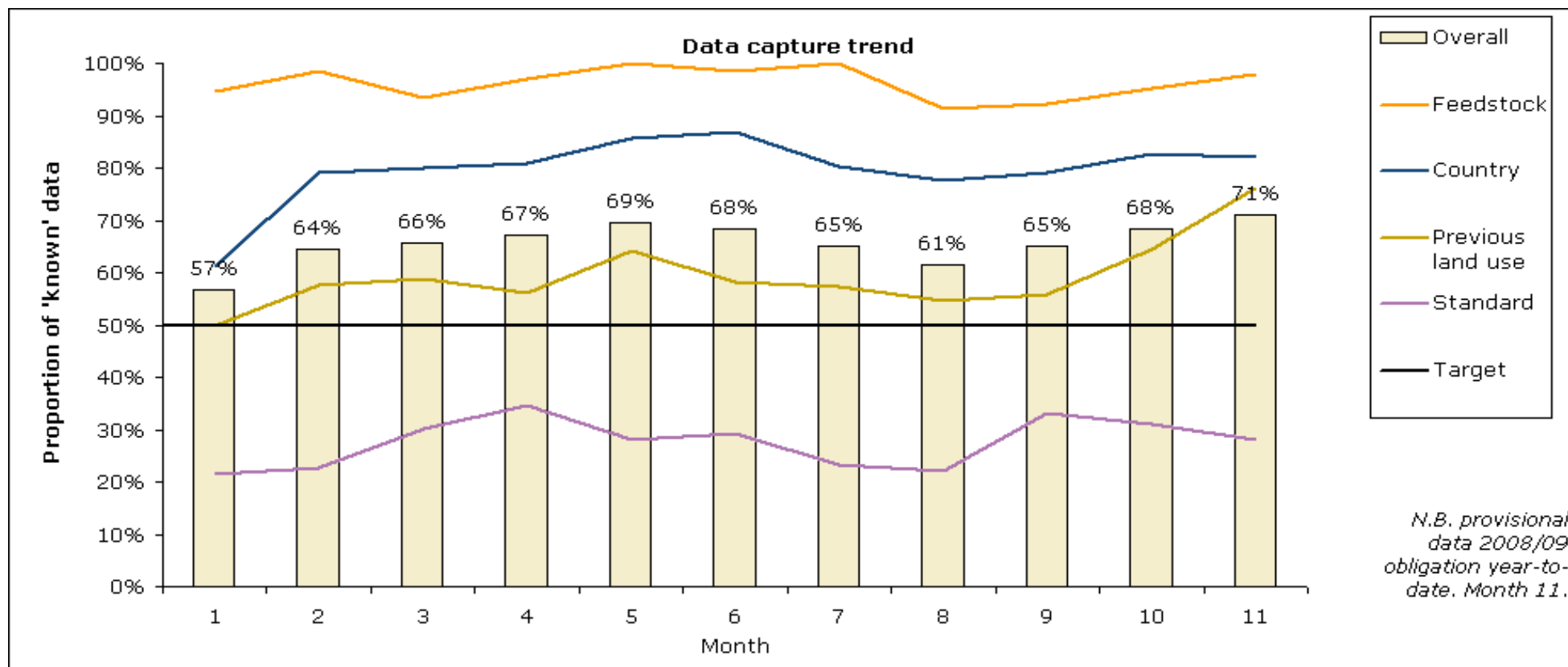
## Performance trends against the RTFO's targets



## Performance trends against the RTFO's targets



## Performance trends against the RTFO's targets



These trend graphs are based on the most up to date information available to the RFA when the report is published. Fuel suppliers are encouraged to revise their data where they are able to provide more accurate information later in the year - for instance adding information if they found out the previous land use of a biofuel plantation, or removing information if they had reason to believe that a sustainability standard might have been incorrectly reported. These data may not therefore correspond exactly to the data in previous RFA reports. All data is subject to final verification at the end of the year.

Refer to the notes and glossary for further information about terms in the darker shaded boxes

Table 1: Volume of biofuels supplied for road transport under the RTFO.

		Volume, million l, or million kg
Fuel type	Biodiesel	967.0
	Bioethanol	190.3
	Biogas	0.3
	<b>Total</b>	<b>1157.5</b>

Table 2: Carbon and sustainability data of biofuels by fuel type.

		Volume, l or kg	Volume, million l or million kg	Volume, %	Proportion meeting an environmental standard				Proportion meeting a social standard				Carbon intensity, g(CO <sub>2</sub> e)/MJ	Greenhouse gas saving, %	Accuracy level, (0-5)
					RTFO	Qualifying Standards	Other standards	None/ unknown	RTFO	Qualifying Standards	Other standards	None/ unknown			
Fuel type	Biodiesel	966952530	967.0	84%	3%	17%	10%	71%	0%	17%	13%	71%	50	42%	2.1
	Bioethanol	190303411	190.3	16%	18%	1%	0%	81%	0%	1%	18%	81%	25	70%	3.4
	Biogas	291020	0.3	0.03%	0%	100%	0%	0%	0%	100%	0%	0%	27	69%	4.0
	<b>Total</b>	<b>1157546961</b>	<b>1157.5</b>	<b>100%</b>											
	<b>Mean</b>				<b>5%</b>	<b>14%</b>	<b>8%</b>	<b>72%</b>	<b>0%</b>	<b>14%</b>	<b>13%</b>	<b>72%</b>	<b>46</b>	<b>46%</b>	<b>2.3</b>

Table 3: Carbon and sustainability data of biodiesel from different feedstocks, countries, and according to the previous land-use.

		Volume, l	Volume, million l	Volume, %	Proportion meeting an environmental standard				Proportion meeting a social standard				Carbon intensity, g(CO <sub>2</sub> e)/MJ	Greenhouse gas saving, %	Accuracy level, (0-5)
					RTFO	Qualifying Standards	Other standards	None/ unknown	RTFO	Qualifying Standards	Other standards	None/ unknown			
Feedstock	Oilseed rape	282271110	282.3	29%	9%	0%	34%	57%	0%	0%	43%	57%	53	38%	2.0
	Palm	113349282	113.3	12%	0%	16%	0%	84%	0%	16%	0%	84%	47	45%	2.1
	Soy	393621337	393.6	41%	0%	2%	0%	98%	0%	2%	0%	98%	60	30%	2.1
	Sunflower	2172624	2.2	0%	0%	0%	0%	100%	0%	0%	0%	100%	55	36%	2.0
	Tallow	101657204	101.7	11%	0%	100%	0%	0%	0%	100%	0%	0%	17	80%	3.0
	Used cooking oil	32166694	32.2	3%	0%	100%	0%	0%	0%	100%	0%	0%	13	85%	3.0
	Unknown	41714279	41.7	4%	0%	0%	0%	100%	0%	0%	0%	100%	55	36%	0.0
	<b>Total Mean</b>	<b>966952530</b>	<b>967.0</b>	<b>100%</b>	<b>3%</b>	<b>17%</b>	<b>10%</b>	<b>71%</b>	<b>0%</b>	<b>17%</b>	<b>13%</b>	<b>71%</b>	<b>50</b>	<b>42%</b>	<b>2.1</b>
Country of origin	Argentina	68328766	68.3	7%	0%	4%	0%	96%	0%	4%	0%	96%	48	44%	2.0
	Belgium	168718	0.2	0%	0%	15%	0%	85%	0%	15%	0%	85%	49	44%	2.0
	Brazil	6215796	6.2	1%	0%	0%	1%	99%	0%	0%	1%	99%	78	10%	2.0
	Canada	21936258	21.9	2%	0%	0%	0%	100%	0%	0%	0%	100%	56	35%	2.0
	Denmark	3755629	3.8	0%	0%	100%	0%	0%	0%	100%	0%	0%	14	84%	2.0
	Finland	65453	0.1	0%	0%	0%	0%	100%	0%	0%	0%	100%	54	37%	2.0
	France	7771349	7.8	1%	0%	1%	76%	23%	0%	1%	76%	23%	45	48%	2.5
	Germany	128155086	128.2	13%	0%	1%	69%	30%	0%	1%	69%	30%	48	44%	2.1
	Indonesia	25807459	25.8	3%	0%	29%	0%	71%	0%	29%	0%	71%	47	46%	2.0
	Ireland	1039012	1.0	0%	0%	90%	0%	10%	0%	90%	0%	10%	16	82%	2.4
	Malaysia	56484931	56.5	6%	0%	19%	0%	81%	0%	19%	0%	81%	47	45%	2.8
	Netherlands	133914	0.1	0%	0%	100%	0%	0%	0%	100%	0%	0%	13	85%	2.0
	Sweden	999063	1.0	0%	0%	0%	0%	100%	0%	0%	0%	100%	55	36%	2.0
	Ukraine	6697037	6.7	1%	0%	0%	38%	62%	0%	0%	38%	62%	58	32%	2.0
	UK	59051079	59.1	6%	42%	56%	0%	2%	0%	56%	42%	2%	30	65%	3.6
	USA	348657146	348.7	36%	0%	26%	0%	74%	0%	26%	0%	74%	50	43%	2.6
	Unknown	231685834	231.7	24%	0%	4%	0%	96%	0%	4%	0%	96%	59	31%	0.8
	<b>Total Mean</b>	<b>966952530</b>	<b>967.0</b>	<b>100%</b>	<b>3%</b>	<b>17%</b>	<b>10%</b>	<b>71%</b>	<b>0%</b>	<b>17%</b>	<b>13%</b>	<b>71%</b>	<b>50</b>	<b>42%</b>	<b>2.1</b>
Previous land-use	By-product	133823898	133.8	14%	0%	100%	0%	0%	0%	100%	0%	0%	16	81%	3.0
	Cropland	452762342	452.8	47%	3%	6%	14%	77%	0%	6%	17%	77%	54	37%	2.4
	Grassland - ag. use	813277	0.8	0%	0%	0%	100%	0%	0%	0%	100%	0%	168	-94%	2.0
	Unknown	379553013	379.6	39%	3%	0%	9%	88%	0%	0%	12%	88%	58	33%	1.5
	<b>Total Mean</b>	<b>966952530</b>	<b>967.0</b>	<b>100%</b>	<b>3%</b>	<b>17%</b>	<b>10%</b>	<b>71%</b>	<b>0%</b>	<b>17%</b>	<b>13%</b>	<b>71%</b>	<b>50</b>	<b>42%</b>	<b>2.1</b>

Table 4: Carbon and sustainability data of bioethanol from different feedstocks, countries, and according to the previous land-use.

		Volume, l	Volume, million l	Volume, %	Proportion meeting an environmental standard				Proportion meeting a social standard				Carbon intensity, g(CO <sub>2</sub> e)/MJ	Greenhouse gas saving, %	Accuracy level, (0-5)
					RTFO	Qualifying Standards	Other standards	None/unknown	RTFO	Qualifying Standards	Other standards	None/unknown			
Feedstock	Cheese (by-product)	960	0.0	0%	0%	100%	0%	0%	0%	100%	0%	0%	61	28%	2.0
	Molasses	1349299	1.3	1%	0%	100%	0%	0%	0%	100%	0%	0%	40	53%	2.0
	Sugar beet	33988569	34.0	18%	100%	0%	0%	0%	0%	0%	100%	0%	25	71%	4.0
	Sugar cane	154236820	154.2	81%	0%	0%	0%	100%	0%	0%	0%	100%	25	70%	3.3
	Sulphite	265998	0.3	0%	0%	100%	0%	0%	0%	100%	0%	0%	39	54%	2.0
	Unknown	461765	0.5	0%	0%	0%	0%	100%	0%	0%	0%	100%	61	28%	0.0
	<b>Total Mean</b>	<b>190303411</b>	<b>190.3</b>	<b>100%</b>	<b>18%</b>	<b>1%</b>	<b>0%</b>	<b>81%</b>	<b>0%</b>	<b>1%</b>	<b>18%</b>	<b>81%</b>	<b>25</b>	<b>70%</b>	<b>3.4</b>
Country of origin	Brazil	153190456	153.2	80%	0%	0%	0%	100%	0%	0%	0%	100%	25	71%	3.3
	Ireland	960	0.0	0%	0%	100%	0%	0%	0%	100%	0%	0%	61	28%	2.0
	Malawi	1349299	1.3	1%	0%	100%	0%	0%	0%	100%	0%	0%	40	53%	2.0
	Pakistan	1046364	1.0	1%	0%	0%	0%	100%	0%	0%	0%	100%	115	-36%	2.0
	Sweden	265998	0.3	0%	0%	100%	0%	0%	0%	100%	0%	0%	39	54%	2.0
	UK	33988569	34.0	18%	100%	0%	0%	0%	0%	0%	100%	0%	25	71%	4.0
	Unknown	461765	0.5	0%	0%	0%	0%	100%	0%	0%	0%	100%	61	28%	0.0
	<b>Total Mean</b>	<b>190303411</b>	<b>190.3</b>	<b>100%</b>	<b>18%</b>	<b>1%</b>	<b>0%</b>	<b>81%</b>	<b>0%</b>	<b>1%</b>	<b>18%</b>	<b>81%</b>	<b>25</b>	<b>70%</b>	<b>3.4</b>
Previous land-use	By-product	1616257	1.6	1%	0%	100%	0%	0%	0%	100%	0%	0%	40	53%	2.0
	Cropland	93046433	93.0	49%	37%	0%	0%	63%	0%	0%	37%	63%	25	71%	3.9
	Unknown	95640721	95.6	50%	0%	0%	0%	100%	0%	0%	0%	100%	26	69%	3.0
	<b>Total Mean</b>	<b>190303411</b>	<b>190.3</b>	<b>100%</b>	<b>18%</b>	<b>1%</b>	<b>0%</b>	<b>81%</b>	<b>0%</b>	<b>1%</b>	<b>18%</b>	<b>81%</b>	<b>25</b>	<b>70%</b>	<b>3.4</b>

Table 5: Carbon and sustainability data of biogas from different feedstocks, countries, and according to the previous land-use.

		Volume, kg	Volume, million kg	Volume, %	Proportion meeting an environmental standard				Proportion meeting a social standard				Carbon intensity, g(CO <sub>2</sub> e)/MJ	Greenhouse gas saving, %	Accuracy level, (0-5)
					RTFO	Qualifying Standards	Other standards	None/unknown	RTFO	Qualifying Standards	Other standards	None/unknown			
Feedstock	MSW	291020	0.3	100%	0%	100%	0%	0%	0%	100%	0%	0%	27	69%	4.0
Country of origin	UK	291020	0.3	100%	0%	100%	0%	0%	0%	100%	0%	0%	27	69%	4.0
Previous land-use	By-product	291020	0.3	100%	0%	100%	0%	0%	0%	100%	0%	0%	27	69%	4.0

Refer to the notes and glossary for further information about terms in the darker shaded boxes

Table 6: Carbon and sustainability data for biofuels by fuel type, feedstock, country of origin and previous land-use

			Feedstock	Country of origin	Previous land-use	Volume, l or kg	Volume, million l or million kg	Volume, %	Proportion meeting an environmental standard				Proportion meeting a social standard				Carbon intensity, g(CO <sub>2</sub> e)/MJ	Greenhouse gas saving, %	Accuracy level, (0-5)	
									RTFO	Qualifying Standards	Other standards	None/ unknown	RTFO	Qualifying Standards	Other standards	None/ unknown				
Fuel type	Biodiesel	Oilseed rape	Belgium	Cropland		33653	0.0	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%	55	36%	2.0
			Unknown	Unknown		109159	0.1	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%	55	36%	2.0
			Canada	Cropland		16465515	16.5	1%	0%	0%	0%	100%	0%	0%	0%	0%	100%	56	35%	2.0
			Unknown	Unknown		5470743	5.5	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%	56	35%	2.0
			Finland	Unknown		65453	0.1	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%	54	37%	2.0
			France	Unknown		7681405	7.7	1%	0%	0%	76%	24%	0%	0%	76%	24%	45	47%	2.5	
			Germany	Cropland		78128448	78.1	7%	0%	0%	81%	19%	0%	0%	81%	19%	48	44%	2.0	
				Grassland - ag. use		813277	0.8	0%	0%	0%	100%	0%	0%	100%	0%	0%	168	-94%	2.0	
			Unknown	Unknown		48151101	48.2	4%	0%	0%	51%	49%	0%	0%	51%	49%	48	45%	2.1	
			Ireland	Cropland		99458	0.1	0%	0%	0%	0%	100%	0%	0%	0%	100%	40	54%	5.0	
			Sweden	Cropland		999063	1.0	0%	0%	0%	0%	100%	0%	0%	0%	100%	55	36%	2.0	
			Ukraine	Unknown		4524413	4.5	0%	0%	0%	57%	43%	0%	0%	57%	43%	60	31%	2.0	
			United Kingdom	Cropland		12506777	12.5	1%	99%	0%	0%	1%	0%	0%	99%	1%	52	40%	4.9	
				Unknown		13188416	13.2	1%	94%	0%	0%	6%	0%	0%	94%	6%	53	39%	4.0	
			United States	Cropland		8566424	8.6	1%	0%	0%	0%	100%	0%	0%	0%	100%	90	-4%	2.0	
				Unknown		4591704	4.6	0%	0%	0%	0%	100%	0%	0%	0%	100%	90	-4%	2.0	
			Unknown	Cropland		9607369	9.6	1%	0%	0%	0%	100%	0%	0%	0%	100%	55	36%	1.0	
				Unknown		71268732	71.3	6%	0%	0%	0%	100%	0%	0%	0%	100%	55	36%	1.0	
		Palm	Indonesia	Cropland		19829542	19.8	2%	0%	37%	0%	63%	0%	37%	0%	63%	47	46%	2.0	
			Unknown	Unknown		5977917	6.0	1%	0%	0%	0%	100%	0%	0%	0%	100%	47	46%	2.0	
			Malaysia	Cropland		42923481	42.9	4%	0%	25%	0%	75%	0%	25%	0%	75%	47	45%	2.9	
			Unknown	Unknown		13561450	13.6	1%	0%	0%	0%	100%	0%	0%	0%	100%	47	45%	2.3	
		Soy	Unknown	Unknown		31056892	31.1	3%	0%	0%	0%	100%	0%	0%	0%	100%	47	46%	1.0	
			Argentina	Cropland		53329182	53.3	5%	0%	5%	0%	95%	0%	5%	0%	95%	48	44%	2.0	
			Unknown	Unknown		14999584	15.0	1%	0%	0%	0%	100%	0%	0%	0%	100%	48	44%	2.0	
			Brazil	Cropland		278393	0.3	0%	0%	0%	0%	100%	0%	0%	0%	100%	78	10%	2.0	
			Unknown	Unknown		5937403	5.9	1%	0%	0%	1%	99%	0%	0%	1%	99%	78	10%	2.0	
			United States	Cropland		207772506	207.8	18%	0%	3%	0%	97%	0%	3%	0%	97%	58	32%	2.5	
		Sunflower	Unknown	Unknown		41665224	41.7	4%	0%	0%	0%	100%	0%	0%	0%	100%	58	33%	2.2	
			Unknown	Cropland		55876	0.1	0%	0%	0%	0%	100%	0%	0%	0%	100%	78	10%	1.0	
			Unknown	Unknown		69583169	69.6	6%	0%	0%	0%	100%	0%	0%	0%	100%	78	10%	1.0	
			Unknown	Unknown		2166655	2.2	0%	0%	0%	0%	100%	0%	0%	0%	100%	55	36%	2.0	
		Tallow	Ukraine	Cropland		5969	0.0	0%	0%	0%	0%	100%	0%	0%	0%	100%	55	36%	2.0	
			Unknown	Unknown		25906	0.0	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	2.0		
			Belgium	By-product		3755629	3.8	0%	0%	0%	100%	0%	0%	0%	100%	14	84%	2.0		
			Denmark	By-product		89944	0.1	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	2.0		
			France	By-product		697854	0.7	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	2.0		
			Germany	By-product		401978	0.4	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	2.0		
			Ireland	By-product		67095	0.1	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	2.0		
			Netherlands	By-product		4167934	4.2	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	2.0		
			United Kingdom	By-product		86061288	86.1	7%	0%	0%	100%	0%	0%	0%	100%	18	79%	3.2		
			United States	By-product		6389576	6.4	1%	0%	0%	100%	0%	0%	0%	100%	13	85%	1.0		
			Unknown	By-product		364406	0.4	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	2.0		
			Germany	By-product		537576	0.5	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	2.3		
			Ireland	By-product		66819	0.1	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	2.0		
			Netherlands	By-product		29187952	29.2	3%	0%	0%	100%	0%	0%	0%	100%	13	85%	3.2		
			United Kingdom	By-product		2009941	2.0	0%	0%	0%	100%	0%	0%	0%	100%	13	85%	1.0		
			Unknown	Unknown		41714279	41.7	4%	0%	0%	0%	100%	0%	0%	0%	100%	55	36%	0.0	
Bioethanol	Unknown		Unknown		960	0.0	0%	0%	0%	100%	0%	0%	0%	100%	61	28%	2.0			
	Cheese (by-product)		Ireland	By-product		1349299	1.3	0%	0%	100%	0%	0%	0%	100%	40	53%	2.0			
	Molasses	Malawi	By-product		33988569	34.0	3%	100%	0%	0%	0%	0%	100%	0%	25	71%	4.0			
	Sugar beet	United Kingdom	Cropland		59057864	59.1	5%	0%	0%	0%	100%	0%	0%	100%	25	71%	3.8			
	Sugar cane	Brazil	Cropland		94132592	94.1	8%	0%	0%	0%	100%	0%	0%	100%	25	71%	3.0			
		Unknown	Unknown		1046364	1.0	0%	0%	0%	0%	100%	0%	0%	100%	115	-36%	2.0			
		Pakistan	Unknown		265998	0.3	0%	0%	0%	100%	0%	0%	0%	100%	39	54%	2.0			
	Sulphite	Sweden	By-product		461765	0.5	0%	0%	0%	0%	100%	0%	0%	100%	61	28%	0.0			
	Unknown	Unknown	Unknown		291020	0.3	0%	0%	0%	100%	0%	0%	0%	100%	27	69%	4.0			
	Biogas	MSW	United Kingdom	By-product																
Total Mean					1157546961	1158.0	100%	5%	14%	8%	72%	0%	14%	13%	72%	46	46%	2.3		