

## ARB STAFF DISCUSSION OF THE REPORTING PROGRAM IN THE UK RENEWABLE TRANSPORT FUEL OBLIGATION

### 1. What is the Renewable Transport Fuel Obligation?

The UK Renewable Transport Fuel Obligation (RTFO) Program will, from April 2008, place an obligation on fuel suppliers to ensure that a certain percentage of their aggregate sales is made up of biofuels. The effect of this will be to require 5% of all UK fuel sold on UK forecourts to come from a renewable source by 2010. Through this initiative, the RTFO expects to reduce the carbon emissions from road transport in 2010 by about 1 million tonnes, equivalent to taking 1 million cars off the road.

### 2. Requirements for Carbon and Sustainability Reporting

The obligated suppliers of fossil fuel for road transportation (Obligated Suppliers, including refiners, importers and any others who supply fossil based road transportation fuels) will be required to produce *Renewable Transport Fuel Certificates (RTFCs)* showing that an amount of renewable fuel has been supplied which is equivalent to a specified percentage of their overall fuel sales. The certificates can be earned from their own sales of renewable fuels, or can be acquired from other suppliers of renewable fuels. Alternatively, obligated companies can buy out of their obligation. The buy out price will be \$1.2 per gallon in the first two years. It is proposed that obligated suppliers who wish to claim RTFCs will be required to submit *monthly and annual carbon and sustainability (C&S) reports*.

#### 2.1 Monthly Report

The monthly reports are expected to be required by the 15th day of the month following the month in which the fuel was supplied. Non-obligated fuel suppliers must provide a C&S report whenever they wish to apply for RTF certificates. Fuel suppliers will submit two reports to the RTFO Administrator: a volume report and a carbon and sustainability (C&S) report. The volume report and C&S report can be submitted separately and at different times, provided both reports meet the deadline and that they cover the same period. The volumes in the C&S report must match the volumes in the volume report.

Monthly reports should contain the following information:

##### *General batch information*

- Administrative batch number<sup>\*</sup>: Each batch number will be unique. The batch refers to an administrative batch, not necessarily a physical batch.
- Volume of fuel: expressed in liters for liquid fuel or kg in the case of gas.
- Fuel type: indicating the fuel type: biodiesel, bioethanol, biomethane or bio-ETBE.
- Feedstock: the feedstock type from which the fuel is made.
- Feedstock origin: the country of origin of the feedstock.

<sup>\*</sup> Administrative batch: any amount of product with identical sustainability characteristics. The sustainability characteristics are: fuel type; feedstock; feedstock origin; environmental standard; social standard; and land use.

*Sustainability information for each administrative batch*

- Environmental standard: suppliers can report any standard benchmarked against the RTFO Sustainable Biofuel Meta-Standard. The standard does not need to be a Qualifying Standard to be reported. However, the UK Government intends to set targets to indicate the proportion of biofuels which is expected to meet a Qualifying Standard.
  - For by-products, sustainability reporting is not required: fill in ‘by-product’.
  - If supplementary checks are performed successfully on the gap criteria of Qualifying Standards the RTFO Sustainable Biofuel Meta-Standard can be reported.
- Social standard: suppliers can report any standard benchmarked against the Sustainable Biofuel Meta-Standard. The standard does not need to be a Qualifying Standard to be reported. However, supplier targets will be set for the proportion of biofuels which is expected to meet a Qualifying Standard.
  - For by-products, sustainability reporting is not required: fill in ‘by-product’.
  - For highly mechanized farming, reporting on labor conditions is not required, but reporting on land rights issues must be fully completed. If compliance with land rights criteria is not reported, the social standard is not fully complied with and does not count towards the indicative target.
  - If supplementary checks are performed on the gap-criteria the RTFO Sustainable Biofuel Meta-Standard can be reported.
- Land use in November 2005:
  - Guidance on how to determine the Land use in November 2005 is taken from IPCC guideline.
  - For by-products fill in: ‘by-product’.

*Carbon information for each administrative batch*

- Carbon intensity expressed in g CO<sub>2</sub>e / MJ.
- Impact of land use change expressed in g CO<sub>2</sub>e / MJ.
- Accuracy level – a measure of what type of data was used to derive the carbon intensity of a batch of biofuel.

An example of the monthly report is presented in Attachment 1.

## **2.2 Annual Report**

Under the RTFO Order, the RTFO obligation period runs from April 15<sup>th</sup> one year to April 14<sup>th</sup> the following year and each annual C&S report should cover an obligation period. It is expected that the Administrator will require annual reports by 30<sup>th</sup> September in the same year and that these will have to be accompanied by a *verifier’s statement*. The annual report will not be linked to the issuing of certificates, but failure to submit an annual report is an offence which may incur a civil penalty.

The core information in the annual report from the fuel supplier consists of the aggregated data from monthly reports over a single obligation period (April 15<sup>th</sup> to April 14<sup>th</sup>). This aggregated data must incorporate any changes that have been made by a supplier submitting a variance report. The annual report also requires fuel suppliers to

provide additional information relevant to the sustainability and carbon intensity of their biofuels.

### 2.3 Verification

In order to provide confidence in the carbon and sustainability claims, all information submitted in the annual RTFO C&S report must be verified independently. The Administrator may impose a civil penalty on any supplier that does not supply the required independent verification.

There is no requirement to pass physical evidence (such as copies of invoices etc) from farms, processors or other suppliers along the supply chain. The company which generates the carbon and/or sustainability data retains this evidence. In verifying the carbon and sustainability data reported by a fuel supplier, the verifier is able to work back up the supply chain to the source data using the chain of custody records. The cooperation of those in the supply chain is therefore vital.

With respect to sustainability data, certificates of accepted standards are sufficient proof of compliance with the criteria and indicators of that standard: these will not be verified again. If it is claimed that the RTFO Sustainable Biofuels Meta-Standard is met, certificates from the supplementary checks will be required as evidence.

All other C&S data is subject to verification, for example:

- Carbon data
- Evidence of Land Use in November 2005
- Chain of Custody records
- Other information provided in the annual report

This verification approach is recommended in the UC Report for use in the California Low Carbon Fuel Standard (LCFS).

### 3. Key Point of the RTFO Carbon Reporting Calculation Methodology

The essential part of the carbon reporting calculation methodology is *default values*, which provide estimates of the carbon intensity of different fuel chains. *Accuracy Levels* are defined corresponding to type of default value or data used, as summarized in Table 1. Default values in accuracy levels 0~2 are provided by the RTFO, examples are presented in Attachment 2. Obligated suppliers can choose to report using different levels default values. If actual data are available, the obligated suppliers can calculate and report their own carbon information using the carbon reporting calculation spreadsheet provided by the RTFO. If part of the data in the spreadsheet is using actual data, it corresponds to accuracy level 3; if all data in the spreadsheet are using actual data, it corresponds to accuracy level 4. The spreadsheet for the calculation of corn to ethanol is shown in Attachment 3.

Table 1. Accuracy levels corresponding to type of default value or data used

Type of default value or data	Accuracy level
Fuel default	0
Feedstock default	1
Feedstock & origin default	2
Selected default	3
Actual data	4

#### 4. References

UK Department for Transport. Carbon and Sustainability Reporting within the Renewable Transport Fuel Obligation Requirements and Guidance-Draft Government Recommendation to RTFO Administrator. June 2007

Available at [http://www.arb.ca.gov/fuels/lcfs/lcfs\\_uk1.pdf](http://www.arb.ca.gov/fuels/lcfs/lcfs_uk1.pdf)

(Note: The revised version of this Guidance will be released by the UK Department for Transport in January 2008)

Attachment 1: Example of Monthly Reporting Format  
(Source: RTFO C&S Reporting Guidance)

Batch number	Fuel type	Quantity of fuel (litres or kg <sup>1</sup> )	Biofuel Feedstock	Feedstock Origin	Sustainability Information			Carbon Information		
					Env. Standard	Social Standard	Land use in Nov 2005	Carbon intensity g CO <sub>2</sub> e / MJ	Impact of LUC	Accuracy level
33001	Bioethanol	250,000	Wheat	UK	LEAF	Mechanised. + LEAF	Cropland	72	0	2
33002	Bioethanol	100,000	Wheat	France	-	Mechanised	Cropland	76	0	2
33003	Bioethanol	250,000	Sugar beet	UK	ACCS	Mechanised	Cropland	45	0	4
33004	Bioethanol	1,000,000	Sugar cane	Brazil	-	-	Cropland	19	0	2
33005	Bioethanol	500,000	Unknown	Unknown	-	-	Unknown	72	Unknown	0
33006	Biodiesel	1,000,000	Oilseed rape	UK	ACCS	Mechanised + RTFO	Cropland	79	0	2
33007	Biodiesel	250,000	Oilseed rape	Unknown	-	Mechanised	Unknown	79	0	2
33008	Biodiesel	500,000	Palm oil	Malaysia	RSPO + RTFO	RSPO + RTFO	Cropland	49	Unknown	2
33009	Biomethane	150,000	Dry manure	UK	By-product	By-product	By-product	36	0	2
33010	Bio-ETBE	500,000	Wheat	UK	LEAF	Mechanised + LEAF	Cropland	12	0	2

<sup>1</sup>) biogas should be reported in kg and liquid fuels in litres

Attachment 2: Default Value Tables  
(Source: RTFO C&S Reporting Guidance)

Accuracy Level 0: Fuel Default Values

Fuel	Carbon Intensity (grams CO <sub>2e</sub> / MJ)
Bioethanol	78
Biodiesel	77
Biomethane	36
Bio-ETBE	42

Accuracy Level 1: Feedstock Default Values

Fuel	Feedstock	Carbon Intensity (grams CO <sub>2e</sub> / MJ)
Bioethanol	Wheat	78
	Sugar beet	51
	Corn	125
Biodiesel	Oilseed rape	77
	Soy	59
	Palm	51
	UCO & tallow	14
Biomethane	MSW & manure	36
ETBE – refinery isobutene	Wheat	17
	Sugar beet	5
	Sugar cane	30
	Corn	42
ETBE – imported isobutene	Wheat	30
	Sugar beet	56
	Sugar cane	78
	Corn	51

## Accuracy Level 2: Feedstock &amp; Origin Default Values

Fuel	Feedstock	Origin	Carbon Intensity (grams CO <sub>2e</sub> / MJ)
Bioethanol	Wheat	Canada	104
		France	83
		Germany	77
		United Kingdom	78
	Sugar beet	UK	51
	Sugar cane	Brazil	20
	Corn	US	125
France		62	
Biodiesel	Oilseed rape	Australia	78
		Canada	77
		France	67
		Germany	69
		Poland	66
		United Kingdom	77
	Soy Palm	Argentina	22
		Brazil	59
		USA	32
		Malaysia	51
		Indonesia	51
UCO & tallow	UK	14	
Biomethane	MSW or manure	UK	36
ETBE – refinery isobutene	Wheat	Canada	24
		France	17
		Germany	14
		United Kingdom	15
	Sugar beet	UK	5
	Sugar cane	Brazil	-6
	Corn	US	30
France		9	

### Attachment 3: Example of Carbon Calculation Spreadsheet (Corn to Ethanol) (Source: RTFO C&S Reporting Guidance)

<b>Stage 1 - Crop Production</b>							
Description	Cultivation and harvest of corn						
<b>Basic Data</b>							
Yield @ traded moisture content	Units [t corn / ha.a]	<input type="text" value="value"/>	Y				
Traded moisture content	%	<input type="text" value="value"/>	M1				
<b>Soil Emissions</b>							
N <sub>2</sub> O emissions				Emissions factor (kgCO <sub>2</sub> e/ha) <i>calculation</i> N FERT x 6.613	+ Y =	Emissions (kgCO <sub>2</sub> e/t corn) <i>calculation</i>	1
<b>Farming Inputs</b>							
		Mass of input		Emissions co-efficient		Emissions (kgCO <sub>2</sub> e/t corn)	
N fertiliser	[kg N / ha.a]	<input type="text" value="value (N FERT)"/>	x	<input type="text" value="value"/>	+ Y =	<i>calculation</i>	2
P fertiliser	[kg P <sub>2</sub> O <sub>5</sub> / ha.a]	<input type="text" value="value"/>	x	<input type="text" value="value"/>	+ Y =	<i>calculation</i>	3
K fertiliser	[kg K <sub>2</sub> O / ha.a]	<input type="text" value="value"/>	x	<input type="text" value="value"/>	+ Y =	<i>calculation</i>	4
Lime (CaCO <sub>3</sub> )	[kg CaCO <sub>3</sub> / ha.a]	<input type="text" value="value"/>	x	<input type="text" value="value"/>	+ Y =	<i>calculation</i>	5
Pesticides	[kg/ha.a]	<input type="text" value="value"/>	x	Emissions co-efficient [kgCO <sub>2</sub> e/kg] <input type="text" value="value"/>	+ Y =	<i>calculation</i>	6
<b>Machinery Inputs</b>							
Diesel fuel consumption	[litres/ha.a]	<input type="text" value="value"/>	x	Emissions factor (kgCO <sub>2</sub> e/litre) <input type="text" value="value"/>	+ Y =	<i>calculation</i>	7
<b>Coproducts</b>							
Credit	[t/ha.a]	<input type="text" value="value"/>	x	Emissions co-efficient [kgCO <sub>2</sub> e/t] <input type="text" value="value"/>	+ Y =	<i>calculation</i>	8
<b>Totals</b>							
Module total					1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 =	Emissions (kgCO <sub>2</sub> e/t corn) <i>calculation</i>	9
Contribution to fuel chain					( 9 ) x Allocation =	Emissions [kg CO <sub>2</sub> e / t ethanol] <i>calculation</i>	Stage_1

<b>Stage 2 - Drying and storage</b>							
Description	Drying of corn						
Moisture removed	% by weight	<input type="text" value="value"/>	M2				
<b>Fuel / input type</b>							
Fuel for heating	[MJ/t corn]	<input type="text" value="value"/>	x	Emissions co-efficient [kgCO <sub>2</sub> e/MJ] <input type="text" value="value"/>	=	Emissions [kgCO <sub>2</sub> e / tcorn] <i>calculation</i>	10
Electricity	[MJ/t corn]	<input type="text" value="value"/>	x	<input type="text" value="value"/>	=	<i>calculation</i>	11
<b>Totals</b>							
Module total					10 + 11 =	Emissions [kgCO <sub>2</sub> e / tcorn] <i>calculation</i>	12
Contribution to fuel chain					( 12 ) x Allocation =	Emissions [kg CO <sub>2</sub> e / t ethanol] <i>calculation</i>	Stage_2

<b>Stage 3 - Feedstock Transport</b>							
Description	Farm to ethanol plant						
Transport distance	[km]	<input type="text" value="value"/>	dist_1	Emissions factor (kgCO <sub>2</sub> e/MJ)			
Fuel consumption	[MJ/t-km]	<input type="text" value="value"/>	FC_1				
<b>Totals</b>							
Module total	[MJ/t]	<i>calculation</i> = dist 1 x FC 1	x	<input type="text" value="value"/>	=	Emissions (kgCO <sub>2</sub> e/t corn) <i>calculation</i>	13
Contribution to fuel chain					( 13 ) x Allocation =	Emissions [kg CO <sub>2</sub> e / t ethanol] <i>calculation</i>	Stage_3

## Stage 4 - Conversion

Description	Ethanol plant					
<b>Basic data</b>						
Plant yield	[t ethanol / t corn]	<input type="text" value="value"/>	Z			
<b>Conversion Inputs</b>						
Coal	[MJ/t pure ethanol]	<input type="text" value="value"/>	x	Emissions factor (kgCO <sub>2</sub> e/MJ)	=	Emissions (kgCO <sub>2</sub> e/t ethanol) <input type="text" value="calculation"/> 14
Electricity import	[MJ/t pure ethanol]	<input type="text" value="value"/>	x	<input type="text" value="value"/>	=	<input type="text" value="calculation"/> 15
<b>Co-products</b>						
Co-products treated by substitution				Credit [kg CO <sub>2</sub> e/t co-product]		
Quantity of co-product 1	[t co-product 1 / t ethanol]	<input type="text" value="value"/>	x	<input type="text" value="value"/>	=	<input type="text" value="calculation"/> 16
Quantity of co-product 2	[t co-product 2 / t ethanol]	<input type="text" value="value"/>	x	<input type="text" value="value"/>	=	<input type="text" value="calculation"/> 17
Quantity of co-product 3 etc	[t co-product 3 / t ethanol]	<input type="text" value="value"/>	x	<input type="text" value="value"/>	=	<input type="text" value="calculation"/> 18
<b>Co-products treated by allocation by market value</b>						
Allocation factor - percentage of emissions attributable to ethanol	%				=	<input type="text" value="calculation"/> Allocation
<b>Co-products treated by allocation by energy content</b>						
Allocation factor - percentage of emissions attributable to ethanol	%				=	<input type="text" value="calculation"/> Allocation
<b>Totals</b>						
Module total		( 14 + 15 + 16 + 17 + 18 ) x Allocation =			=	Emissions (kgCO <sub>2</sub> e/t ethanol) <input type="text" value="calculation"/> 19
Contribution to fuel chain					=	Emissions [kg CO <sub>2</sub> e / t ethanol] <input type="text" value="calculation"/> Stage_4

## Stage 5 - Liquid fuel transport and storage

Description	Ethanol plant to refinery/blending facility					
Transport distance	[km]	<input type="text" value="value"/>	dist_2			
Fuel consumption	[MJ/t-km]	<input type="text" value="value"/>	FC_2			
<b>Totals</b>						
Module total	[MJ/t ethanol]	<input type="text" value="calculation = dist 2 x FC 2"/>	x	Emissions factor (kgCO <sub>2</sub> e/MJ)	=	Emissions (kgCO <sub>2</sub> e/t ethanol) <input type="text" value="calculation"/> 20
Contribution to fuel chain					=	<input type="text" value="calculation"/> Stage_5

## Stage 6 - Liquid fuel transport and storage

Description	Ethanol plant to refinery/blending facility					
Transport distance	[km]	<input type="text" value="value"/>	dist_3			
Fuel consumption	[MJ/t-km]	<input type="text" value="value"/>	FC_3			
<b>Totals</b>						
Module total	[MJ/t ethanol]	<input type="text" value="calculation = dist 3 x FC 3"/>	x	Emissions factor (kgCO <sub>2</sub> e/MJ)	=	Emissions (kgCO <sub>2</sub> e/t ethanol) <input type="text" value="calculation"/> 21
Contribution to fuel chain					=	Emissions [kg CO <sub>2</sub> e / t ethanol] <input type="text" value="calculation"/> Stage_6