Summary of the Key Changes to the Carbon and Sustainability Guidance

1. Introduction

This document describes the key changes to carbon and sustainability (C&S) guidance following the draft issued and consulted upon by the Department for Transport in June 2006. It is provided for those familiar with the guidance to aid their interpretation of the final guidance issued by the Renewable Fuels Agency (RFA). Explanation of the changes is provided in the DfT response to the consultation.

2. Principles and Criteria

The following criteria were amended:

- Criterion 2.1. To cover potential adverse effects on adjacent areas that may be linked to the production site, the criterion now reads 'Compliance with national laws, regulations relevant to biomass production and the area ***(and surrounds)*** where biomass production takes place'.

  The list of indicators now includes 'Environmental Impact Assessment' regulations (as in 3.1 and 4.1 and 5.1)

- Criterion 2.3. The first indicator is now more specific: 'Documentation of the status of rare, threatened or endangered species ***(resident, migratory or otherwise)*** and high conservation value habitats in and around the production site'

- Criterion 2.4. None of the benchmarked standards addresses the hard 10% number for setting aside for nature conservation. The criterion is now more flexible for local interpretation (based on FSC): *'Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources'.*

  The second indicator has been removed as it is covered by criterion 2.3.
  NB. As this criterion is a recommendation only the changes do not affect the results of the benchmark.

- Criterion 4.2. Additional recommended only indicator: "Records of agrochemical inputs / ha/ year, such as fertilizers and pesticides (specified per agrochemical)"

- Social criteria. The words "should" have been replaced with "must" for all Minimum Requirement criteria and indicators.

- Criterion 6.8 Health and Safety**.** The following has been added: "Accommodation, where provided, shall be clean, safe, and meet the basic needs of the workers."

- Criterion 6.9 Minimum wage. The amended criterion now reads: “Housing and other benefits shall not be deducted from the minimum wage/or relevant industry wage as an in kind payment without the expressed permission of the worker concerned.”

- Criterion 7.2. Wording has been improved for clarity (based on FSC) and now reads: “Procedures are in place to consult and communicate with local populations and interest groups on plans and activities that may negatively affect the legal or customary rights, property, resources, or livelihoods of local peoples.”

- Additional recommended criterion for smallholders (from RSPO) has been added: “Growers and mills should deal fairly with smallholders and other local businesses.” Indicators:
    - Current and past prices for produce are publicly available
    - Pricing mechanisms for produce, inputs and services are documented
    - Evidence is available that all parties understand the contractual agreements they enter into, and that contracts are fair, legal and transparent and that all costs, fees and levies are explained and agreed in advance
    - Agreed payments are made in a timely manner

3. Standards

The following amendments have been made concerning benchmarked standards:

- ACCS has been re-benchmarked following modification to its 2008 standard. ACCS is now a Qualifying Environmental Standard. It is not a Qualifying Social Standard.

- SA8000 was previously identified as a Qualifying Social Standard in error. SA8000 does not cover the relevant land rights criteria and therefore is now not defined as a Qualifying Social Standard.

- ProTerra has been benchmarked. It is not a Qualifying Social or Environmental Standard.

- Several other standards are now available to report but have not been fully benchmarked. They are:

    - Genesis Crops Module, Scottish Quality Cereals, Qualität und Sicherheit (German standard) and Fedioil (Finnish standard)

4. By-products

Owing to the development of new fuel pathways, molasses is now included as a by-product.

5. Simplified data fields in monthly reports

The data fields have been simplified:

- An optional field for the suppliers reference number has been included;
- The two fields 'environmental standard' and 'social standard' have been combined to report one field only – 'standard';
- The identification of the standard as a qualifying level or otherwise is now included within the monthly data report, however this will be an automatic field linked to the data reported in the 'standard' field;
- The 'impact of land use' column for carbon intensity information has been removed as this information is captured and reported within the overall carbon calculation.

6. Removal of 'mechanised' exemptions

The option to report 'mechanised' under the social standard data field for specific feedstocks has been removed.

7. Annual reporting requirement

An additional piece of information has been added to the annual reporting requirements. Companies are required to provide information on any successful prosecutions related to breaches of compliance with the sustainability criteria.

The annual report must now be supplied by September 28th (previously 30th).

8. Chain of Custody

The Guidance provides greater clarity on the approaches permitted within the RTFO. Whilst all approaches are permitted in theory, a book and claim approach for a sustainability standard is not yet operational. Should such an approach be developed e.g. under the RSPO, the RFA will assess the approach to determine its reliability and therefore whether it should be permitted under the RTFO.

9. Equivalence Trading

Data swapping where equivalence trading takes place is now allowed. Specific conditions have been identified that must be met:

- All requirements as defined in the Common Agricultural Policy for equivalence trading need to be met.
- Data swapping is only permitted within the same feedstock in an equivalence trade.
- Trade of C&S data through equivalence trading only takes place between the farm providing the data and the first buyer of the feedstock. From the first buyer onwards the trade in C&S data should continue with the certified Chain of Custody where it exists or through the mass balance approach described in this chapter.
- All the C&S data reported must originate from the same contracted farm (i.e. it is not permitted to use carbon intensity data from one farm and sustainability

information from the other). In calculating the carbon intensity of the fuel the default transportation distance should be used.

- A verifiable system is in place at the farm which provides the C&S data to prevent double counting of C&S data. If, for example, the farm is LEAF certified and this is claimed by the biofuel chain through equivalence trading, the LEAF mark cannot be claimed again with the sale of the physical product.

10. Verification

The example of material mis-statements representing "5%" has been removed to avoid misleading parties. The wording has been modified to make it clear that the verifier will use their experience and judgement to determine if they believe that there may, or may not, be material errors in the annual report or the data used to compile monthly reports.

11. Targets

Targets have been modified. Previous targets are identified in brackets. Changes are identified in bold. Targets for sustainability performance are now based on environmental standards only.

Annual target	2008/9	2009/10	2010/11
Percentage of feedstock meeting a qualifying **environmental** standard	**30%** (0%)	50%	80%
Annual average greenhouse gas saving of biofuel supplied	40%	**45%** (50%)	**50%** (60%)
Data reporting on sustainability characteristics	**50%** (35%)	**70%** (65%)	**90%** (80%)

12. Fuel Chains and GHG calculation methodology

a. Additional fuel chains

The following additional modules and/or fuel chains have been developed within the carbon calculation methodology:

- Ethanol from non-Brazilian sugar cane (Pakistan, South Africa and Mozambique)
- Ethanol from molasses (UK, Pakistan and South Africa)
- Wheat from Ukraine
- Oilseed rape from Finland, Ukraine
- Hydrogenated vegetable oil biodiesel from palm oil, rapeseed and soy.

b. Additional tier for selected defaults

In addition to providing data for RFA-defined selected defaults (e.g. if you know the conversion process has CHP there is a default value provided) an additional 'tier' of information is able to be provided. Data which accurately represents how a biofuel was produced, but has not necessarily been collected directly from the supply chain can now, under certain conditions, be used in place of default values. Such data might include a survey of agronomic practices in the particular region of a country

from which a feedstock is sourced. This data would be subject to verification in the same was as actual data and, therefore, obligated suppliers will need to carefully assess the accuracy of the data and the extent to which it is representative of their supply chain.

c. Land Use Change

The amortisation period has been altered to 20 years in line with existing IPCC guidelines

The soil type default for palm oil from Indonesia has been changed from mineral soil to peat soil.

The land-type definition of cropland previously excluded set-aside that had been out of production for 5 years or more. Such a time limit is out of step with the European definition under the CAP and therefore the Guidance now treats set-aside as 'cropland' for the purposes of land definition.

A table that defines carbon intensity values for specific land use changes in the same metric as the fuel chain default values (g CO_2e / MJ) has been added to the Guidance.

d. Co-product treatment

The carbon calculation methodology previously allocated upstream emissions to co-products on an energy basis if the co-products were used for an energy end-use. Co-products used for an energy end-use are now treated by substitution.

e. Changes common to several fuel chains

An error was identified with the emissions coefficients for P, K, Lime and Magnesium fertilisers (all types) – they were given on the basis of individual elements (i.e. P, K etc) instead of "oxides" (i.e. P_20_5). The latter is the standard way in which fertiliser application rates are reported – and the application rates we have used in the crop production modules are reported on this basis. This change, has a significant impact on all fuel chains with a crop production module, and it is referred to below as "Fertiliser emissions co-efficient change"

An error was identified in the way in which fuel and electricity emissions were calculated for "Drying and storage" of crops. The default values are set by estimating the amount of energy required to remove a certain weight of moisture from the crop. This weight of moisture is calculated on the basis of the "percent of moisture removed" – an error was made in this calculation and it has now been corrected. This error has a small effect on the carbon intensity of all chains with a "drying and storage" step – it is referred to below as "drying energy requirements change"

Changes to single default values have been made to ensure consistent use of significant figures. The majority of calculations are based on three significant figures, except where the evidence or magnitude justified greater precision.

f. Wheat to ethanol

Major influences on the fuel chain default value arise from:

- Fertiliser emissions co-efficient change (decreases emissions from the crop production module)
- CHP assumed for the conversion plant (decreases emissions from the conversion module)
- Credit for DDGS displacing soymeal (decreases emissions from the conversion module)
- Crop production where all N2O emissions from soils have been removed from the default values as they are not, in fact, default values, rather they are calculated on the basis of the nitrogen fertiliser application rate and the N2O emissions coefficient (which is specified in the worksheet).
- Fertiliser emissions co-efficient change
- Drying energy requirements change
- Amending the natural gas requirements for the ethanol plant to 12,700 MJ / t ethanol (from around 10,800 previously).
- Assuming that the ethanol plant will not import any electricity as most UK-based plants will use a CHP system.
- The credit DDGS receives for displacing soymeal has increased significantly – due to the revised approach to calculating the N2O emissions from soy (i.e. to include the emissions which result from the nitrogen contained in the crop residue).

g. Sugar beet to ethanol

No major changes have been made to this chain, except that the conditions under which it is used are now constrained to only ethanol produced from sugar juice, and not ethanol produced from molasses. Influences on the fuel chain default value are:

- Fertiliser emissions co-efficient change (decreases emissions from the crop production module)
- Introduction of lime as an input into the conversion process (increases emissions from the conversion module)
- Introduction of lime as an input into the conversion process – it had previously been excluded on the grounds that it was a chemical which had a small impact on the overall carbon intensity of the fuel chain. However, it has been reintroduced for consistency: lime is a co-product of the conversion plant.

h. Sugar cane to ethanol

Influences on the fuel chain default value are:

- Fertiliser emissions co-efficient change (decreases emissions from the crop production module)
- N2O emissions from soils have increased
- Emissions from cane harvesting have increased

- N2O emissions have increased: the type of P fertiliser which is applied to the sugar cane in Brazil also contain nitrogen – this had not previously been taken into account as a source of N2O emissions (and it should have been because it is available to the processes which produce N2O in the same way as other fertilisers containing nitrogen).
- Emissions from burning cane have increased – an error in the spreadsheet was identified.
- The default values for Brazilian sugar cane production have been changed – they are now drawn from the same FAO sources as other crop production data.

i. Molasses to ethanol

This new fuel chain has been introduced in order to better reflect how ethanol is produced from sugar crops in the UK, Pakistan and South Africa.

This fuel chain treats sugar as a co-product, and assumes it would have been produced in an identical way to the chain which produced the molasses (i.e. in the UK, the sugar is a co-product of molasses produced from sugar beet, so the sugar it displaces is assumed to be produced from sugar beet in an identical conversion process). The result of this approach is to attribute the molasses entering the ethanol plant with zero carbon intensity.

The energy source in Pakistan and South Africa is assumed to be coal.

j. Corn to ethanol

Major influences on the fuel chain default value are:

- Fertiliser emissions co-efficient change (decreases emissions from the crop production module)
- Drying energy requirements change
- USA: electricity credit has increased due to revised approach to energy co-products.
- France: increased credit for DDGS replacing soymeal
- Drying energy requirements change
- USA only: electricity export is now treated by substitution (instead of energy allocation). Note: electricity is assumed to be exported from this plant because it is a wet mill, which relies exclusively on steam for its heat requirements, unlike the (assumed) UK-based ethanol plants which will use a mixture of steam and direct heat. There is, therefore, more steam available for a turbine.
- France only: the credit for DDGS displacing soymeal has increased due to revised approach to calculating N2O emissions from soy.

k. Oilseed rape to ME biodiesel

Major influences on the fuel chain default value are:

- Fertiliser emissions co-efficient change (decreases emissions from the crop production module)
- Drying energy requirements change
- Increased credit for rapemeal replacing soymeal
- Lower allocation factor for the biodiesel plant (i.e. fewer emissions attributed to biodiesel)
- Drying energy requirements change
- The credit for rapemeal displacing soymeal has increased due to revised approach to calculating N2O emissions from legumes.
- Lower allocation factor for the biodiesel plant (i.e. fewer emissions attributed to biodiesel) due to an increased value for glycerine. Previously £0/tonne had been assumed but was not in line with the approach of using a three-year rolling average. The revised value means that now only 90% of the fuel chain emissions are allocated to the biodiesel (compared with 99% previously). This lowers emissions from ALL modules in the biodiesel chain. Note that this applies to all ME biodiesel chains and is referred to as “revised biodiesel allocation factor”

l. Soya beans to ME biodiesel

Major influences on the fuel chain default value are:

- Revised approach to quantifying N2O emissions from soy
    - Based on comparisons with emissions measured from fields, the previous approach significantly underestimated the N2O emissions arising from soya beans (e.g. by 40 – 50%) but is closely aligned for other crops. This is due to the exclusion of crop residues from the methodology which are now included.
- Fertiliser emissions co-efficient change (decreases emissions from the crop production module)
- Drying energy requirements change
- Reduced credit for soy oil displacing rape oil
- Lower allocation factor for the biodiesel plant (i.e. fewer emissions attributed to biodiesel)
- Drying energy requirements change
- There is interdependency between the soy chain and the rapeseed chain (because their co-products are interchangeable). The effect of this relationship on the soy chain is to decrease the credit it gets for displacing rape oil.
- Lower allocation factor for the biodiesel plant (i.e. fewer emissions attributed to biodiesel)

m. Palm oil to ME biodiesel

The only change to the palm oil chain is that of the lower allocation factor for the biodiesel plant (i.e. fewer emissions attributed to biodiesel)

n. UCO & Tallow to ME biodiesel

The only change to the UCO & Tallow chain is that of the lower allocation factor for the biodiesel plant (i.e. fewer emissions attributed to biodiesel)

o. OSR, Soy and palm to HVO biodiesel

These chains have been introduced in response to the availability of biodiesel from the Neste plant which uses the so-called NextBTL process.

The feedstock production and delivery for these chains is almost identical to those for the conventional (methyl ester) chains – the only differences are the feedstock transport distances, which reflect processing of the oils in Finland (and subsequent delivery of the product to the UK market).

The energy inputs to the conversion plant have been based on a publicly available IFEU study commissioned by Neste. Conservative assumptions have been built into the single default values by assuming no co-products are exported from the plant.

p. ETBE chains

These chains were updated and the modifications circulated to stakeholders in July 2007. The following errors have been corrected:

- Failure to take into account non-renewable nature of part of the ETBE
- Incorrect credit for displacement of methanol
- Incorrect ratio of ethanol to isobutene.