RSB – ROUNDTABLE ON SUSTAINABLE BIOMATERIALS

RSB METHODOLOGY FOR DISPLACEMENT EMISSIONS

Version 1.0

Publication date: 7 December 2018

Status: Approved

RSB reference code: *RSB-STD-04-002 (Version 1.0)*

Contact Details:

RSB - Roundtable on Sustainable Biomaterials
Impact Hub Geneva
Rue Fendt 1
1201 Geneva
Switzerland
web: http://www.rsb.org
email: info@rsb.org

Introduction

This standard is a supplement to the RSB Standard for Advanced Fuels (RSB-STD-01-010) and describes the methodology to estimate displacement emissions to be used by Participating Operators to comply with G.2.1.2.2. of the RSB Standard for Advanced Fuels which states:

"Advanced fuel producers may voluntarily report on indirect emissions that may have been created by the diversion of end-of-life-products or residual feedstocks to the eligible product.

This reporting shall be separate from the Greenhouse Gas Calculation. The operator shall either report that the feedstock meets the requirements of the RSB Low iLUC Risk Biomass Criteria and Compliance Indicators (RSB-STD-04-001), category "Waste and Residues"

or

report on the estimated displacement emission risk level by following the RSB methodology for displacement emissions.

Displacement emissions are indirect emissions from producing a replacement feedstock when an economically valuable feedstock is removed from the market.

Example:

Used Cooking Oil (UCO) can be used to produce biodiesel. UCO qualifies under the new RSB Standard for Advanced Fuels and is therefore eligible for a simplified certification approach and a GHG calculation that starts at the point of origin (i.e. the restaurant that uses vegetable oil for cooking). In contrast, the certification of biodiesel from vegetable oil requires a certification and GHG calculation from the cultivation of the biomass onwards. However, displacement effects might occur if the UCO was used as animal feed fat previously and is now substituted by other vegetable oils (e.g. palm oil).

Main changes from the previous version

N/A - this is the first version of the standard.

TABLE OF CONTENTS

A. Intent of this standard

This standard has been developed to describe a methodology for estimating displacement emissions in line with requirement G.2.1.2.2. of the RSB Standard for Advanced Fuels (RSB-STD-01-010) and requirement F.1.5. of the RSB Standard for Advanced Products (RSB-STD-02-001)

B. Scope of this standard

This standard applies to any operator using end-of-life-products or production residues from agriculture, forestry, livestock, fishery or industrial production, or intermediates produced thereof, for the purpose of producing advanced fuels or advanced products.

C. Status and effective date

Version 1.0 of this RSB Standard shall be effective from January 1st, 2019.

D. Note on the use of this RSB Standard

All aspects of this standard are considered to be normative, including the intent, scope, effective date, note on the use of this standard, references, terms and definitions, and requirements, unless otherwise stated. Users implementing this standard shall ensure that the intent of this standard is met. To ensure that the intent of this standard is met, users shall implement all of the requirements specified in this standard, and all additional measures necessary to achieve the intent of this standard.

Operators applying this standard will be audited in line with the RSB Requirements for Certification Bodies and Auditors to verify the assumptions of the assessment.

E. RSB list of documents and corresponding references

Please see RSB List of Documents and References **(**RSB-DOC-10-001**)**.

F. Terms and definitions

For the purposes of this standard, the terms and definitions given in RSB Glossary of Terms **(**RSB-STD-01-002**)** shall apply.

Additional definitions are:

1. Production residue

   Material that is a secondary product of a process which is inelastic in supply and that has an economic value ratio of ≤ 5% with respect to the primary product(s), co-products and other by-products generated from the same production process.

2. Emission factor

   GHG emissions per unit of activity data (Source: Greenhouse Gas Protocol – Product Life Cycle Accounting and Reporting Standard, 2011).

G. Requirements

1. The operator shall define the end-of-life-product or production residue to be assessed by applying the parameters:
   - Feedstock name
   - Location of advanced fuel / advanced product production
   - Location of likely uses of the advanced fuel / advanced product

2. The operator shall define the annual quantity of the feedstock that is planned to be used for advanced fuel/product production in the scope of certification ($e.g. m_{feedstock}$ [t]).

   Operators may also define the annual quantity of the feedstock by using other metrics than mass, whenever appropriate.

   Please note: As a recommendation, the annual feedstock quantity should be estimated based on the maximum advanced fuel/product production capacity including plans for expansion to avoid recurring assessments. Please see G.11 for more information about the need for updating the assessment.

3. The operator shall compile an inventory of the existing uses of the feedstock by describing each use and the quantity of material used in each use. The inventory shall be produced either when the feedstock is first used for the production of advanced fuels/products or at the time of the first certification. The inventory period shall be the calendar year preceding the time of the inventory. If there are no

changes to feedstock quantity or composition (see also G.11) the re-certification inventory may be the same as the inventory for the first certification.

3. 1. Based on sufficiently robust information, the operator shall determine the geographic scope of the assessment, i.e. if the inventory is to be conducted on a local, a regional or a global level. The geographic scope shall be determined based on the structure of the trade of this feedstock. If the feedstock is traded on a local level, the assessment shall be done locally, if it is traded regionally, the assessment shall be done regionally and if it is traded globally, the assessment shall be done globally.

3. 2. If more than one use for the feedstock exists, the operator may determine only the main use(s) by applying one of the following methods:

- the main use(s) cover 60% of all use(s) (on a mass basis), or
- the main use shall be the use with the largest proportion in 80% of all uses (on a mass basis).

3. 3. Should the feedstock be used in an incineration facility with energy generation, this use shall also be included in the inventory.

4. The operator shall make an inventory of alternative feedstocks that may substitute the assessed feedstock in its identified use(s) (as defined in G.3) by describing each substitute and defining the substitution ratio.

4. 1. The operator shall describe each possible substitute and determine if any constraints exist (e.g. based on regulatory requirements, technical specifications or consumer preferences). If significant constraints exist for a substitute which will make its use very unlikely, then this substitute may be excluded from the further assessment.

4. 2. The operator shall determine the substitution ratio based on the material properties that determine the quantity of the material required to be substituted for its use (as defined in G.3). For food or feed related uses, the substitution ratio shall be determined based on the nutrient composition, for energy related uses the substitution ratio shall be based on the energy content, for chemical related uses, the substitution ratio shall be based on the chemical value.

The chemical value of the feedstocks shall be determined based on the quantity of this feedstock that is required to produce one unit of product, in relationship to other feedstocks. In determining the chemical values, the operator shall not only account for differences in product yields but also additional inputs such as energy or other chemicals, which may be required when using this feedstock.

4. 3. When determining the substitution ratio, the operator may consider scenarios where the feedstock is not fully replaced by a substitute (for example for economic or practical reasons) in order to avoid overestimating the displacement effects.

4. 4. In the case that the existing use is incineration with energy generation, the energy type that most likely will replace the energy from the waste or residue shall be determined as follows:

   - If the operator of the point of origin replaces the waste or residue with a new feedstock for energy generation, the amount of the new feedstock shall be considered;
   - If the operator of the point of origin will either import additional grid electricity or reduce the electricity being fed into the grid, the marginal grid electricity shall be considered.

5. The operator shall assume that the substitute materials assessed in G.4 replace the feedstock in the identified uses evenly and without any preference. Should sufficiently robust information exist to assess the order or composition in which substitute materials are replacing the feedstock in the identified use(s), operators may determine the order or composition of replacement in this manner.

6. The operator shall calculate the quantity of new demand for each substitute material used ($e.g.\ m_{substitute_i}\ [t]$).

   Operators may also define the annual quantity of the new demand by using metrics other than mass, whenever appropriate.

6. 1. The operator shall base the calculation on the assumption that existing uses are replaced evenly, and substitute materials are used evenly. If sufficiently robust information exists to assess the order of replacement the operator shall base the calculation on the order identified.

6. 2. The operator shall consider the substitution ratio (G.4.2.) in the calculation.

7. The operator shall determine the emission factor for each substitute, in metric tons CO2e per unit of substitute material ($EF_{substitute_i}\left[\frac{tCO_{2eq}}{t}\right]$).

7. 1. The operator shall either conduct their own calculation following ISO 14040:2016 in combination with ISO 14044:2006 or use the emission factors of recognised databases (Ecoinvent, GaBi, Renewable Energy Directive default values, GREET and further databases subject to approval of the RSB).

7. 2. For marginal grid electricity, the operator shall determine the emission factor by accounting for:

   - The electricity source that is added to the national grid each year; and
   - The projected trajectory of grid emissions over the lifetime of the project; and
   - The timing of anticipated capital investments for maintenance, upgrade or replacement of the current electricity generation

equipment from which the feedstock is being diverted as displacement risks may no longer be considered when significant capital is required to continue electricity production.

If evidence of the above is not available, the operator shall use the emission factor of the national grid electricity mix.

8. The operator shall calculate the total emissions based on the quantity of substitute materials and their emission factors.

$$E_{Substitute\ materials}\left[t\ CO_{2eq}\right] = \sum m_{\ substitute_i}\ [t] * EF_{substitute_i}\left[\frac{tCO_{2eq}}{t}\right]$$

Where:

$E_{Substitute\ materials}$: Total emissions of the substitute materials

$m_{\ substitute_i}$: Mass of the substitute type

$EF_{substitute_i}$: Emission factor of the substitute type

9. The operator shall calculate the displacement emissions factor per t of feedstock material by dividing the total emissions by the total quantity of feedstock material which is switched to advanced fuel/product production.

$$Displacement\ factor_{feedstock}\ \left[\frac{t\ CO_{2eq}}{t}\right] = \frac{E_{Substitute\ materials}\left[t\ CO_{2eq}\right]}{m_{feedstock}\ [t]}$$

Where:

$Displacement\ factor_{feedstock}$: Displacement factor of the feedstock used

$E_{Substitute\ materials}$: Total emissions of the substitute material

$m_{feedstock}\ [t]$: Mass of the feedstock to be used by the operator

10. If sufficiently robust information exists to assess the order of replacement (see G.5), the operator shall carry out a sensitivity analysis to test the sensitivity of the displacement emission factor to changes of the input factors. Whenever available, the sensitivity analysis shall include indirect land use change emission estimates, using the most regionally appropriate estimates available for the emission factors of the substitutes (G.7).

    The operator shall report the sensitivity range together with the displacement factor.

11. The operator shall calculate the displacement factor or assess compliance with the RSB Low iLUC Risk Biomass Criteria and Compliance Indicators (RSB-STD-04-001) for the certification audit. The operator shall revisit the assessment in the case of significant changes of the feedstock quantity (i.e. an increase of more than 10% of the feedstock quantity), changes to the feedstock composition or other relevant changes of the RSB certification scope.

The assessment shall be revised within one year of the significant change.

Please note: if none of the above is the case, or displacement is no longer relevant for other reasons, the re-calculation of the displacement factor, or the re-assessment of compliance with the RSB Low iLUC Risk Biomass Criteria and Compliance Indicators (RSB-STD-04-001) is not required.

12. The operator shall determine the displacement effect risk level based on the results of the assessment and the sensitivity analysis as follows:

- **Low risk**: Displacement emissions are 30% or less than the total GHG emissions of the fossil comparator;
- **Medium risk**: Displacement emissions are 70% or less than the total GHG emission of the fossil comparator;
- **High risk**: Displacement emissions are more than 70% of the total GHG emissions of the fossil comparator.