Green Gold Label Program

Introduction

This instruction document has been drawn up for all actors in the biomass supply chain, on behalf of the Green Gold Label Foundation (www.greengoldlabel.com) and is applicable to all GGL participants.

Scope

This instruction document contains the rules on data and reference values for the greenhouse gas (GHG) calculation for biomass. With the GHG calculation the fossil greenhouse gasses coming from fossil fuels used for producing the biomass are calculated. Comparing it against a reference value for the fossil fuel mix for the energy grid that the biomass is to replace, in order to decrease the amount of fossil GHG, the balance needs to be positive and above a given value. Because of market demand the GHG calculation has been brought in line with latest version of the BioGrace-II calculation tool.

The aim of this document is to provide lean, simple, accurate and open (with clear reference to all the values used and the origin) GHG calculations which data complies to the requirements of the Biograce II tool, and shall be reported in the Biograce II tool. The next participant in the chain shall use the previous and partial GHG calculations as input for their BioGrace-II Excel tool calculation.
Unless stated otherwise, the calculation is done with data collected over an annual period. Reporting shall include an explanation and source reference. When no specific data is available (disaggregated) default values in the appendices may be used under specific circumstances. These individual default values are noted in the latest version of BioGrace-II Excel tool – Version 4 and the reference values on which they are based. Alternatively under specific circumstances the process default values and disaggregated process default values based on BioGrace-II may be used as noted in Annex VI – Section C of the Renewable Energy Directive (EU) 2018/2001 of the European Commission[1].

Disaggregated default values and default values may only be used if actual values are unavailable and cannot be attained with maximum effort.

The methodology for the calculation of greenhouse gas (GHG) emissions in this document is based on the European Commission's Directive (EU) 2018/2001 – ANNEX VI – Section B "Methodology for greenhouse gas emission from the production and use of biomass fuels before conversion into electricity and heat".

Reference
This instruction document complies with the GHG calculation as prescribed by the following documents:

- *Verification Protocol for Sustainable Solid Biomass for Energy Applications Commissioned by the Ministry of Economic Affairs and Climate policy – January 2021;*
- *European Commission's Renewable Energy Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources – 11 December 2018;*
- *BioGrace-II, the GHG calculation tool–Version 4.*

Sections from the original methodological description that are not relevant for GGL certified material have been omitted. The parts that have been omitted concern GHG calculations of the

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[1] *Also known as RED II Directive*

relative emission reduction of the production of biogas/biomethane, of land use change, of improved agricultural management and of CO2 capturing and storage.
The adjusted formula where not relevant factors are omitted looks like:

[F.1]] [2] $E = e_{ec} + e_p + e_{td} + e_u$

where: E   =   total emissions from the use of the fuel;
       e_{ec} =   emissions from the extraction or cultivation of raw materials;
       e_p =   emissions from processing;
       e_{td} =   emissions from transport and distribution;
 e_u =   emissions from the fuel in use;

Disaggregated default values and default values may only be used if actual values are unavailable and cannot be attained with maximum effort. Values for these disaggregated values are given in BioGrace-II Excel tool–version 4 and Annex VI – Section C of the RED II Directive. If the actual transport distances and/or configuration of the production unit do not enable a choice of the right default value, the most conservative value shall be taken, meaning the value for the largest transport distance and/or a configuration using a natural gas boiler.

System description and rules

Systematical overview
For the collection of data the system is roughly divided into 4 grouped processes or process blocks.

Figure 1: The systematical overview for biomass (calculation) chain of which the biomass is one of the main products produced:
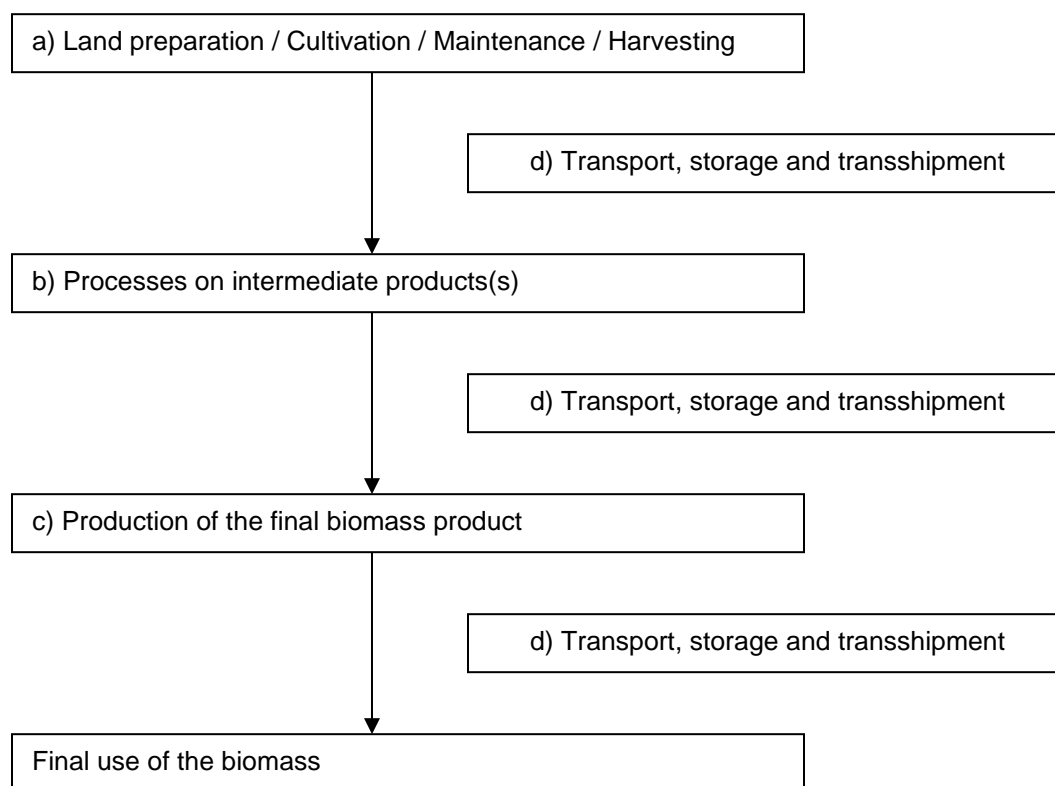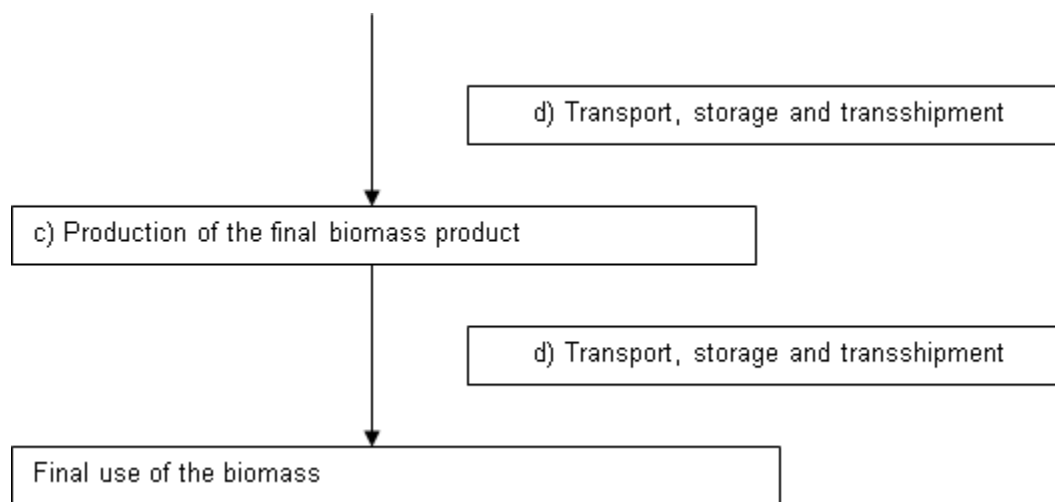
Waste, secondary biomass and primary forest and agricultural crop residues, including treetops and
branches, straw, bagasse, husks, cobs, nut shells and residues from processing, including crude glycerine
(glycerine that has not been refined), shall be considered to have zero life-cycle greenhouse gas emissions up to the process of collection of those materials.

Figure 2: The systematical overview for biomass (calculation) chain from the collection of biomass which is defined as residual flows or residues.

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                                    │ d) Transport, storage and transshipment │
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│ c) Production of the final biomass product│
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                                    ┌────────────────────────────────────────┐
                                    │ d) Transport, storage and transshipment │
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│ Final use of the biomass                  │
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GHG calculation:

Greenhouse gas emissions coming from fossil fuels that are collected and calculated at each process block shall be expressed in terms of grams of CO_2 equivalent per metric ton of fuel (gCO_2eq/ton) and communicated as required by the GGLS4 – Transaction and Product Certificate v2-2 standard as emissions from the extraction or cultivation of raw materials (e_{ec}), emissions from processing (e_p), emissions from transport and distribution (e_{td}) and emissions from the fuel in use (e_{td}), to be added up to a total emission for the biomass by the final user. Because of market requirements the communicated e_{ec} , e_p , e_{td} and , e_u shall be calculated using the Biograce-II tool.
When values for e_{td} or e_p already include the e_u portion they may be reported as e_{td} or e_p (CO_2-equivalent) and with zero e_u to prevent double counting the e_u part.

Renewable fuel or renewable energy is assumed to produce zero CO2 when burning (but (may) still produce CH4 and N2O from the fuel in use).

Disaggregated default values and default values may only be used if actual values are unavailable and cannot be attained with maximum effort. Values for these disaggregated values are given in BioGrace-II Excel tool–version 4 and Annex VI – Section C of the RED II Directive.If the actual transport distances and/or configuration of the production unit do not enable a choice of the right default value, the most conservative value shall be taken, meaning the value for the largest transport distance and/or a configuration using a natural gas boiler.