

BIOGRACE II

Harmonised Greenhouse Gas Calculations
for Electricity, Heating and Cooling from Biomass

Calculation rules

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Agenda

- Purpose with calculation rules
- General BioGrace rules
- Specific BioGrace II rule

Purpose

- Making actual calculations requires rules
- Clarifies the rules given in directive
- Not all rules are given from the directive and report
- Harmonisation within EU

Cut off criteria

- All emissions from processes and products used and associated with the system the economic operator has defined must be included in the GHG calculation. However, if the contribution of that input or process to the total emissions of the biofuel pathway is lower than $0.1 \text{ g CO}_{2,\text{eq}}/\text{MJ}$ biofuel or biomass, it may be excluded.

Cut off criteria

Mass or energy threshold		
0,000005	kg/MJ	(this is equal to 0,005 g/MJ)
0,0002	MJ/MJ	(this is equal to 0,2 kJ/MJ)
10	MJ ha ⁻¹ year ⁻¹	
0,3	kg ha ⁻¹ year ⁻¹	

Electricity usage in fuel production

- Average emission intensity for the country
- Additional standard values

Changing starting values

- When changing a starting value into an actual value, all other starting values in that step should be changed into actual values as well.

Changing starting values

Chipping		
Yield		
Wood chips	0,976	$MJ_{Wood\ chips} / MJ_{Forestry\ residue}$
Moisture content	30%	
Energy consumption		
Diesel	0,0034	$MJ / MJ_{Wood\ chips}$
CH ₄ and N ₂ O emissions from use of diesel		(chipping)

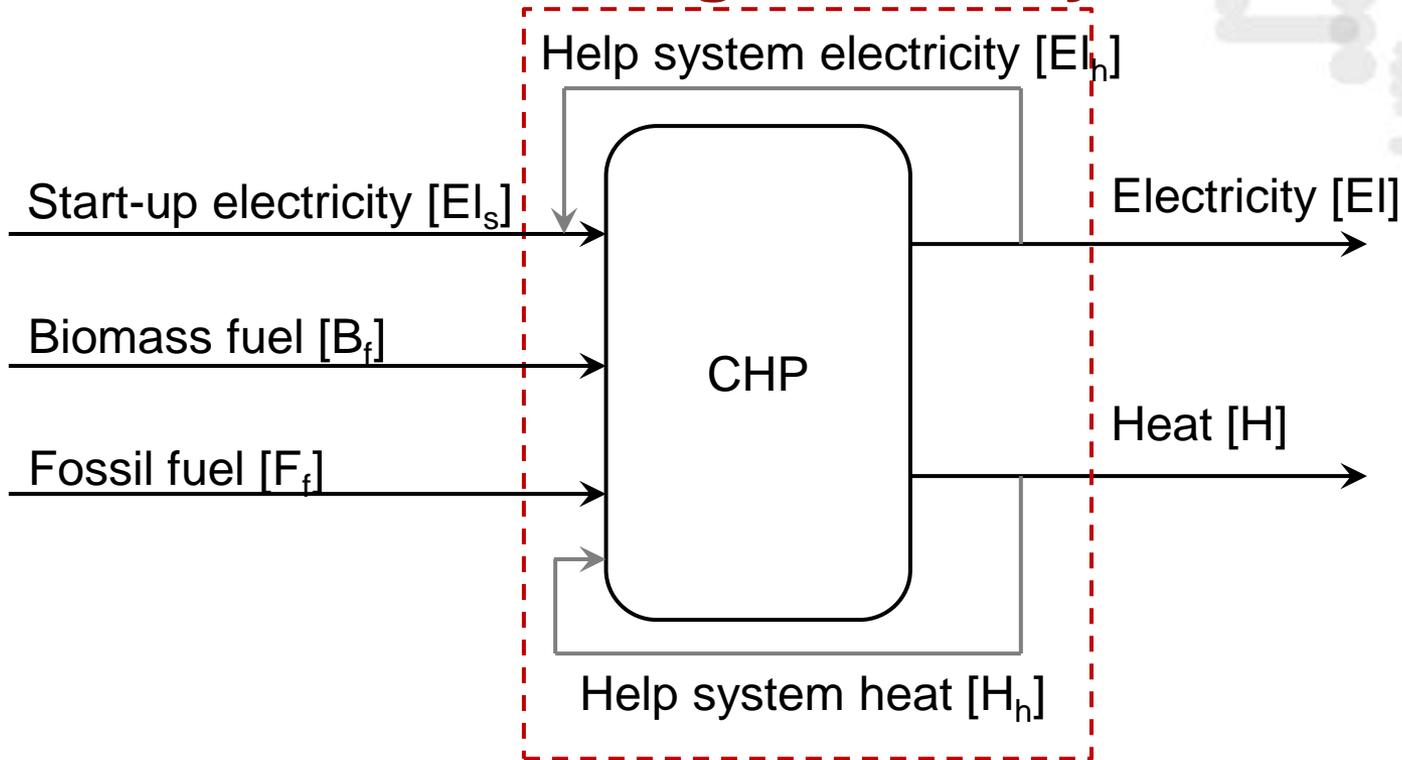
Efficiency rule - Biomass combustion plant

- Start-up fuel or co-combustion fuel
 - Fossil fuel
- Electricity
 - Start-up electricity
 - Help systems (oil pumps, pumps for the feedwater, ventilation pumps)
- Heat
 - Preheating of air or fuel

Guidance from RED

- **RED Article 5(3)**
- In multi-fuel plants using renewable and conventional sources, only the part of electricity produced from renewable energy sources shall be taken into account. For the purposes of this calculation, the contribution of each energy source shall be calculated on the basis of its energy content.

Rule for determining efficiency



$$n_{el} = \frac{El - El_s - El_h}{F_f + B_f}$$

$$n_h = \frac{H - H_h}{F_f + B_f}$$

Requirements

- Fossil fuel input includes any fossil fuel used for start-up, stopping and supporting
- A reference-period of 365 consecutive days shall be used to avoid annual fluctuations in heat requirement or production cycles
- When calculating the annual fuel input, the lower heating value on wet basis shall be used.



Calculation rules to come

- Allocation
 - Final energy carrier
 - Between fuel and co-products
 - Co-digestion

Questions / Input

- Is the rule for efficiency understandable
 - Clarifications needed
- Other input can be sent at a later stage

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Thank you for your attention

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