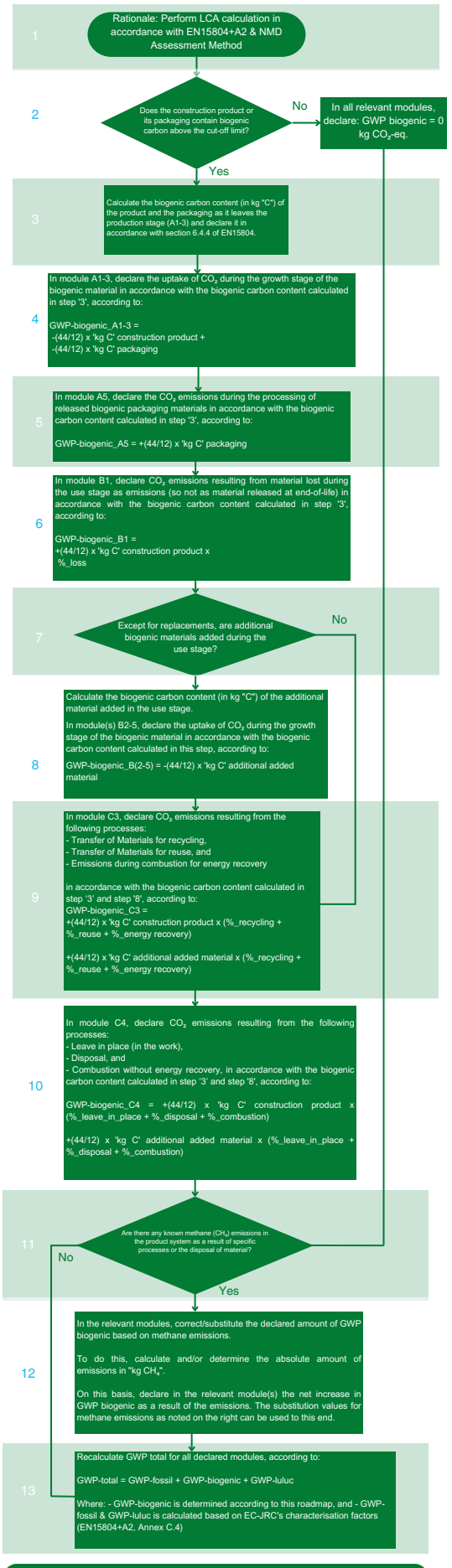
Biogenic carbon in LCA



NOTE: Regardless of the fact that manual calculation of GWP biogenic is proposed, it remains imperative that the chosen Ecoinvent background processes represent the actual ones as closely as possible. See also:

"EN15804+A2, section 6.3.5.5 End-of-life stage,
NOTE 4 Waste disposals for products containing biogenic carbon declared as GWP-biogenic are modelled as closely to reality as possible based on current practices."

This should take into account any differences in moisture content of the construction product and that of the waste disposal processes used. NB the dry mass of the processing process and the construction product must match. One way to do this is to perform a plausibility check. This will assess whether the CO_2 emissions calculated in this roadmap related to the processing of the materials correspond with the emissions modelled in the Ecoinvent background process. Although any differences due to the manual calculation are not relevant for GWP-biogenic, this may result in omissions for other substances.

Notes

The current roadmap describes the method by which GWP biogenic can be calculated manually for a construction product and the relevant packaging materials. The principles described in the roadmap can obviously also be applied to correct the Ecoinvent background processes themselves in terms of the requirements from the standard. If these changes are implemented correctly, the calculated value of GWP-biogenic and GWP-total that follows from the calculation method can be applied directly. This method is more complete and correct but requires more care and consistency in modelling.

The cut-off rules for the biogenic carbon content declarations (see: EN15804+A2, section 6.4.4.) state that GWP biogenic need not be declared if:
1) the mass of biogenic carbon-containing materials in the product is less than 5% of the mass of the product, or
2) if the mass of biogenic carbon-containing materials in the packaging is less than 5% of the total mass of the packaging.

Take into account the moisture percentage of the construction product, the type and density. If species-specific data are not available/known, EN 16449 can be used. When calculating biogenic carbon content, it is irrelevant whether it is a primary or secondary material stream. NB biogenic carbon content is considered an inherent material property.

CAUTION: When calculating the biogenic carbon content, ensure that the moisture percentage is expressed as % relative to the dry mass of the material.

The step described in the process diagram assumes an aggregate declaration of A1-3. If the production stages are declared in separate modules A1, A2 and A3, then the uptake of CO_2 during the growth stage of the biogenic material should be declared as part of GWP biogenic in module A1. Any production losses of biogenic material during this production stage are declared as emissions in GWP biogenic in the relevant sub-module regardless of the processing method, where: GWP-biogenic_A1-3 = GWP-biogenic_A1 + GWP-biogenic_A2 + GWP-biogenic_A3. Here, the sum of the sub-modules should again correspond to the calculation method of GWP-biogenic_A1-3 as described in the process diagram.

CAUTION: Uptakes may not be declared for old-growth forest (natural forest). Emissions from biogenic material of this origin should be declared in GWP-luluc.

Replacement of construction products and packaging due to losses in modules A4 and A5 are not reflected in GWP-biogenic_A4 or GWP-biogenic_A5 because the uptake during the growth stage of the material to be replaced including the processing takes place within the same module and the sum can again be seen as "0".

CAUTION: The possible methane emissions that may take place during the waste treatment of these processes are an exception to this. A check and correction on this should always be done in accordance with steps 11 & 12.

These are known emissions and/or the fraction material that falls under the fraction "%_loss" as listed in the Annex with Lump-sum values for end-of-life processing scenarios accompanying: Environmental Performance Construction Works Assessment Method

This explicitly does not include materials that are added to replace other released materials. Replacement of materials during the use stage in modules B2-B3 are not reflected in GWP-biogenic_B(2-3) because the uptake during the growth stage of the material to be replaced including the processing takes place within the same module and the sum can again be seen as "0". This therefore specifically involves biogenic materials (in quantities above the criteria cut-off rule) that are added to the construction product and which are only released again at the technical end-of-life (in module C). Module B4 implicitly deals with replacement of materials during the use stage and module B5, refurbishment, are outside the scope of the assessment method. They are therefore not included in this step.
EXAMPLE: Bio-based coatings applied over other coating layers, i.e. without removing the original coating layer.

The proposed correction for methane is not necessary if the Ecoinvent background processes themselves are adjusted in which methane is already included in the calculation.

Substitution values for emissions of methane relative to carbon dioxide (from NMD Notitie biogene koolstof):

Calculation method	**Substitution value**
EF 3.0	34,0 kg CO_2-eq/ kg CH_4
EF 3.1	27,1 kg CO_2-eq/ kg CH_4