**Comment/Explanation\*:***Include your justification for your proposed change to the draft standard below.*
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_The Carbon Leadership Forum (CLF) strongly suggests removing all references and requirements to reporting of **net** embodied carbon emissions for a product. Biogenic carbon should **only be** reported separately, as is recommended by the *U.S. EPA C-MORE Draft EPD Criteria for Data Quality and Transparency*, *Project Life Cycle Assessment Requirements: ECHO Recommendations for Alignment, Version 1.0,* and is explicitly required by the majority of North American policies and standards, including CALGreen 5.409 reporting guidance, Vancouver’s Embodied Carbon Guidelines, the NRC Practitioner Guide (2024), Toronto TGS v4 (public project requirements), NYC EO 23 LCA Guidance, the ASCE/SEI draft Prestandard, and Draft standard ICC/ASHRAE 240p (see pg 42, Fig 8 of *Project Life Cycle Assessment Requirements: ECHO Recommendations for Alignment).*

EPA’s draft data quality and transparency criterion #17 states that EPDs should: “report impacts from biogenic carbon, Module D, book and claim systems, and other carbon dioxide removal mechanisms separately, in line with the requirements from the relevant PCRs.” The net embodied carbon metric currently included in the standard directly contradicts this separation.

This recommendation is particularly important in the context of this standard’s limitation to only A1-A3. Accounting for biogenic carbon only in stages A1-A3, rather than across the life cycle A-C, does not account for the end of life emissions when the stored carbon is inevitably released at the end of a product’s life. This also contradicts existing product category rules (PCRs) that dictate the creation of EPDs. This method thereby includes counting the uptake of carbon in bio-based materials, but excludes the end of life release of that carbon, resulting in large negative numbers that do not reflect the complete biogenic carbon flow.

At a minimum, biogenic carbon storage must be reported separately until the scope of this standard is expanded to include the additional stages to align with existing standards and more accurately report biogenic flows throughout the process. This means that all references to a net value must be removed from reporting and calculations. In the following section, we indicate the edits to remove net metrics from sections 6.3.3, 6.4 and 6.5. We also remove the corresponding biogenic carbon storage metrics, given that metric has been adjusted to be optional, and additional calculations should not be provided.

References:

U.S. Environmental Protection Agency (EPA). (2024). *U.S. EPA C-MORE Draft EPD Criteria for Data Quality and Transparency* <https://www.epa.gov/system/files/documents/2024-12/c-more_draft_epd_criteria_data_quality_transparency.pdf>

Lewis, M., Watkins, L., Loader, C., and Lambert, M. (2024). *Project Life Cycle Assessment Requirements: ECHO Recommendations for Alignment, Version 1.0.* ECHO Project. <https://www.echo-project.info/publications>

**Proposed Change to the Draft Standard\***
*Use “strikethrough” and “underline” formatting to indicate all proposed changes. Changes must be shown with “hard-formatting” strikethrough and underline, not “track changes”.*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### ~~6.3.3 Net~~ *~~embodied carbon~~* ~~for products~~

~~Net~~ *~~embodied carbon~~* ~~emissions for each~~ *~~Minimum Assessed Product~~* ~~may be calculated as follows:~~

**~~NEC~~~~product~~ ~~= GEC~~~~product~~ ~~– CS~~~~product~~**

~~Where:~~

~~NEC~~~~product~~ ~~= Net~~ *~~embodied carbon~~* ~~for a project-specific quantity of a~~ *~~building product~~* ~~for life cycle modules A1-A3+A5.3 (kg CO~~~~2~~~~e)~~

~~GEC~~~~product~~ ~~= GWP for a project-specific quantity of a~~ *~~building product~~* ~~for life cycle modules A1-A3+A5.3 (kg CO~~~~2~~~~e)~~

~~CS~~~~product~~ ~~= Carbon storage for a project-specific quantity of a~~ *~~building product~~* ~~for life cycle modules A1-A3 (kg CO2)~~

## **6.4 Total Embodied Carbon Emissions Results**

Total emissions results shall include the gross *embodied carbon* emissions ~~and carbon storage~~ for the *assessed dwelling unit.* ~~The net embodied carbon may be included distinctly in accordance with Section 8.~~

For *assessed dwelling units* with *attached dwelling units*, the total *embodied carbon* emissions results shall be calculated according to one of the methods below and stated explicitly in the report according to Section 8:

1. Whole Building Method: summation of the total gross *embodied carbon* emissions ~~and total carbon storage~~ for all *Minimum Assessed Products* for the entire *building* according to Section 5.4 and calculated according to Section 6.3
2. Threshold Method: summation of the total *embodied carbon* emissions ~~and total carbon storage~~ according to Section 6.3 according to the *threshold specifications* for each unique *dwelling unit* type resulting from the *worst-case analysis* for the *Minimum Assessed Products* according to Section 5.4 of that *dwelling unit* type and multiplied by the number of *dwelling units* per unique *dwelling unit* type.[[1]](#footnote-0) This result is summed with the total *embodied carbon* emissions and total carbon storage according to Section 6.3 for the *Minimum Assessed Products* for the foundation system, roof system, and common areas for the total *embodied carbon* results representative of the *assessed dwelling unit.*

### 6.4.1 Total gross *embodied carbon* emissions for *assessed dwelling unit.*

The total *embodied carbon* emissions for the *assessed dwelling unit* shall be calculated as follows:

**TGECA1-A3+A5.3 = ∑GECproduct**

Where:

TGECA1-A3+A5.3 = total gross *embodied carbon* emissions for the entire *assessed dwelling unit* (kg CO2e)

GECproduct = gross *embodied carbon* for each *Minimum Assessed Product*

### ~~6.4.2 Total carbon storage for~~ *~~assessed dwelling unit~~*

~~The total carbon storage for the~~ *~~assessed dwelling unit~~* ~~shall be calculated as follows:~~

**~~TCS~~~~A1-A3~~ ~~= ∑CS~~~~product~~**

~~Where:~~

~~TCS~~~~A1-A3~~ ~~= total carbon storage for the entire~~ *~~assessed dwelling unit~~* ~~(kg CO2)~~

~~CS~~~~product~~ ~~= carbon storage for each~~ *~~Minimum Assessed Product~~*

### ~~6.4.3 Optional: total net~~ *~~embodied carbon~~* ~~emissions for~~ *~~assessed dwelling unit~~*

~~The total net~~ *~~embodied carbon~~* ~~emissions for the~~ *~~assessed dwelling unit~~* ~~shall be calculated as follows:~~

**~~TNEC~~~~A1-A3+A5.3~~ ~~= TGEC~~~~A1-A3+A5.3~~ ~~– TCS~~~~A1-A3~~**

~~Where:~~

~~TNEC~~~~A1-A3+A5.3~~ ~~= Total net~~ *~~embodied carbon~~* ~~emissions for the entire~~ *~~assessed dwelling unit e~~*

~~TGCE~~~~A1-A3+A5.3~~ ~~= total gross~~ *~~embodied carbon~~* ~~emissions for the entire~~ *~~assessed dwelling unit~~* ~~(kg CO~~~~2~~~~e)~~

~~TCS~~~~A1-A3~~ ~~= total carbon storage for the entire~~ *~~assessed dwelling unit~~* ~~(kg CO2)~~

##

## 6.5 Embodied Carbon Emissions Intensity Results

The *embodied carbon* emissions intensity of the *assessed dwelling unit* shall be calculated according to *gross floor area* (m2 or ft2), *conditioned floor area* (m2 or ft2) and either *bedrooms (for* a single *detached dwelling unit)* or *units (*formultiple *attached dwelling units)*.

### 6.5.1 Total gross *embodied carbon* intensity by *gross floor area*

The total gross *embodied carbon* intensity of the *gross floor area* shall be calculated as follows:

$TGECI\_{GFA}=\frac{TGEC\_{A1-A3+A5.3}}{GFA}$

Where:

TGECA1-A3+A5.3 = total gross *embodied carbon* emissions for the entire *assessed dwelling unit* (kg CO2e)

GFA = *gross floor area*

### ~~6.5.2 Optional: Net~~ *~~embodied carbon~~* ~~intensity by~~ *~~gross floor area~~*

~~The total net~~ *~~embodied carbon~~* ~~intensity of the~~ *~~gross floor area~~* ~~shall be calculated as follows:~~

$TNECI\_{GFA}=\frac{TNEC\_{A1-A3+A5.3}}{GFA}$

~~Where:~~

~~TNECI~~~~GFA~~ ~~= Net~~ *~~embodied carbon~~* ~~intensity by~~ *~~gross floor area~~*

~~TNEC~~~~A1-A3 + A5.3~~ ~~= Total net~~ *~~embodied carbon~~* ~~emissions for the entire~~ *~~assessed dwelling unit~~*

~~GFA =~~ *~~gross floor area~~*

### 6.5.3 Gross *embodied carbon* intensity by *conditioned floor area*

The total gross *embodied carbon* intensity of the *conditioned floor area* shall be calculated as follows:

$TGECI\_{CFA}=\frac{TGEC\_{A1-A3+A5.3}}{CFA}$

Where:

TGECICFA = total gross *embodied carbon* intensity by *conditioned floor area*

TGECA1-A3 + A5.3 = total gross *embodied carbon* emissions for the entire *assessed dwelling unit* (kg CO2e)

CFA = *conditioned floor area*

### ~~6.5.4 Optional: Net~~ *~~embodied carbon~~* ~~intensity by~~ *~~conditioned floor area~~*

~~The total net~~ *~~embodied carbon~~* ~~intensity of the~~ *~~conditioned floor area~~* ~~shall be calculated as follows:~~

$TNECI\_{CFA}=\frac{TNEC\_{A1-A3+A5.3}}{CFA}$

~~Where:~~

~~TNECI~~~~CFA~~ ~~= total net~~ *~~embodied carbon~~* ~~intensity by~~ *~~conditioned floor area~~*

~~TNEC~~~~A1-A3 + A5.3~~ ~~= total net~~ *~~embodied carbon~~* ~~emissions for the entire~~ *~~assessed dwelling unit~~* ~~(kg CO~~~~2~~~~e)~~

~~CFA =~~ *~~conditioned floor area~~*

### 6.5.5 Gross *embodied carbon* intensity per *bedroom*

The total gross *embodied carbon* intensity by number of *bedrooms* shall be calculated as follows:

$TGECI\_{BDR}=\frac{TGEC\_{A1-A3+A5.3}}{BDR}$

Where:

TGECIBDR = Gross *embodied carbon* intensity per *bedroom*

TGECA1-A3 + A5.3 = total gross *embodied carbon* emissions for the entire *assessed dwelling unit* (kg CO2e)

BDR = number of *bedrooms* indicated on the *construction documents*

### ~~6.5.6 Optional: Net~~ *~~embodied carbon~~* ~~intensity per~~ *~~bedroom~~*

~~The total net~~ *~~embodied carbon~~* ~~intensity by number of~~ *~~bedrooms~~* ~~shall be calculated as follows:~~

$TNECI\_{BDR}=\frac{TNEC\_{A1-A3+A5.3}}{BDR}$

~~Where:~~

~~TNECI~~~~BDR~~ ~~= total net~~ *~~embodied carbon~~* ~~intensity per~~ *~~bedroom~~*

~~TNEC~~~~A1-A3 + A5.3~~ ~~= total net~~ *~~embodied carbon~~* ~~for the entire~~ *~~assessed dwelling unit~~* ~~(kg CO2e)~~

~~BDR = number of~~ *~~bedrooms~~* ~~indicated on the~~ *~~construction documents~~*

### 6.5.7 Gross *embodied carbon* intensity per unit

The total gross *embodied carbon* intensity per unit shall be calculated as follows:

$TGECI\_{UNIT}=\frac{CFA\_{UNIT} ×TGEC\_{A1-A3+A5.3}}{GFA\_{building}}$

Where:

TGECIUNIT = gross *embodied carbon* intensity per unit

CFAUNIT = *conditioned floor area* of unit

TGECA1-A3 + A5.3 = total gross *embodied carbon* emissions for the entire *assessed dwelling unit* (kg CO2e)

GFABUILDING = *gross floor area* of *assessed dwelling unit*

### ~~6.5.8 Optional: Net~~ *~~embodied carbon~~* ~~intensity per unit~~

~~The total net~~ *~~embodied carbon~~* ~~intensity per unit shall be calculated as follows:~~

$TNECI\_{UNIT}=\frac{CFA\_{UNIT} ×TNEC\_{A1-A3+A5.3}}{GFA\_{building}}$

~~Where:~~

~~TNECI~~~~UNIT~~ ~~= net~~ *~~embodied carbon~~* ~~intensity per unit~~

~~CFA~~~~UNIT~~~~=~~ *~~conditioned floor area~~* ~~of unit~~

~~TNEC~~~~A1-A3 + A5.3~~ ~~= total net~~ *~~embodied carbon~~* ~~emissions for the entire~~ *~~assessed dwelling unit~~* ~~(kg CO~~~~2~~~~e)~~

~~GFA~~~~BUILDING~~ ~~=~~ *~~gross floor area~~* ~~of~~ *~~assessed dwelling unit~~*

*~~…~~*

~~8.5.3 GWP results for net embodied carbon (including NEC~~~~product~~~~, TNEC, TNECI~~~~GFA~~~~, TNECI~~~~CFA~~~~, TNECI~~~~BDR~~ ~~and/or TNECI~~~~UNIT~~~~) may be included in a project and/or confirmed embodied carbon report. The results shall not be included in any total results and shall be accompanied by the text: For informative purposes only.~~

1. (Normative Note) Dwelling Units with the same construction type, same envelope systems, same number of bedrooms, same number of stories within the unit, same window area (+ 10 percent), same conditioned floor area (+10 percent, not to exceed +100 square feet), and same ceiling height (+0.5 feet) are permitted to be the same unit type. [↑](#footnote-ref-0)