GREENHOUSE GAS PROTOCOL

Scope 3 Technical Working Group Meeting

Working draft, do not cite

Full TWG
Phase 2, Meeting 4
Category-specific boundaries & optionality (continued)

October 30th, 2025

WORLD RESOURCES INSTITUTE

World Business Council for Sustainable Development

Agenda

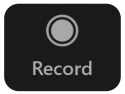
(Draft; for discussion)

- Housekeeping (5 min)
- Timeline for Phase 2 (5 min)
- Cross-cutting Series D (30 min)
  - I. Cradle-to-gate emission factors for fuel/energy
  - II. Inclusion of capital goods used by activities
  - III. Remaining optional boundary activities
- Category 11, Sold product annualization (30 min)
- Category 11, metrics (5 min)
- Category 2 *total* amort. and 8 *annual* amort. (25 min)
- A1. Disaggregation (15 min)
- Next steps (5 min)

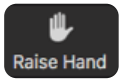
(Draft; for discussion)

Housekeeping and decision-making criteria

Welcome and Meeting information

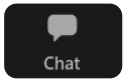


This meeting is recorded.



Please mute yourself by default and unmute when speaking

Please use the Raise Hand function to speak during the call.



You can also use the chat function in the main control.

Recording, slides, and meeting minutes will be shared after the call.

Housekeeping

- TWG members should **not disclose any confidential information** of their employers, related to products, contracts, strategy, financials, compliance, etc.

- In TWG meetings, **Chatham House Rule** applies:
  - "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed."

- **Compliance and integrity** are key to maintaining the credibility of the GHG Protocol
  - Specifically, all participants need to follow the **conflict-of-interest policy**
  - **Anti-trust rules** have to be followed; please avoid any discussion of competitively sensitive topics*

* Such as pricing, discounts, resale, price maintenance or costs; bid strategies including bid rigging; group boycotts; allocation of customers or markets; output decisions; and future capacity additions or reductions

Decision-Making Criteria

- Evaluating options: Describe pros and cons of each option relative to each criterion. Qualitatively assess the degree to which an option is aligned with each criterion through a green (most aligned), yellow (mixed alignment), orange (least aligned) ranking system. Some criteria may be not applicable for a given topic; if so, mark N/A.
- Comparing options: The aim is to advance approaches that ideally meet all decision criteria (i.e. maximize pros and minimize cons against all criteria). If options present tradeoffs between criteria, the hierarchy should be generally followed, such that, for example, scientific integrity is not compromised at the expense of other criteria, while aiming to find solutions that meet all criteria.

Illustrative example	**Option A: Name**	**Option B: Name**	**Option C: Name**
1A. Scientific integrity	• Pros • Cons	• Pros • Cons	• Pros • Cons
1B. GHG accounting and reporting principles	• Pros • Cons	• Pros • Cons	• Pros • Cons
2A. Support decision making that drives ambitious global climate action	• Pros • Cons	• Pros • Cons	• Pros • Cons
2B. Support programs based on GHG Protocol and uses of GHG data	• Pros • Cons	• Pros • Cons	• Pros • Cons
3. Feasibility to implement	• Pros • Cons	• Pros • Cons	• Pros • Cons

Note: This is a summary version. For further details, refer to the full decision-making criteria included in the annex to the Governance Overview, available at https://ghgprotocol.org/our-governance.

(Draft; for discussion)

Timeline for Phase 2

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(Draft; for discussion)

Full Scope 3 TWG Meetings

Meeting #	Date	Time	Topic
1	*Aug 28*		• *Category-specific boundaries & optionality*
2	*Sep 18*		• *Category-specific boundaries & optionality (continued)*
3	*Oct 9*		• *A1. Disaggregation (cross-harmonization with CS TWG and other editorial revisions)* • *Category-specific boundaries & optionality (continued)* • *NEW: Category 10/11 boundaries, justified exclusions, and emission factor guidance*
4	Oct 30	9-11 AM ET	• Cross-cutting boundary for capital goods and WTW of fuels used for category activities • Category-specific boundaries/optionality and Category 10/11 boundaries (continued)
5	Nov 20	4-6 PM ET	• Category-specific boundaries/optionality and Category 10/11 boundaries (continued) • Possibly: Introduce breakouts to develop quantification and/or EF requirements
6	Dec 11	9-11 AM ET	• Category-specific quantification requirements and guidance (Cat. 2, 15, etc.) • Category-specific EF requirements and guidance (Cat. 4/9, 6, 7, and 5/12) • Category-specific classification and emission factors (Cat. 1, 2, 3, 8/13)

* This is not a TWG meeting; it is the Secretariat's meeting with the ISB to present proposed revisions from the TWG

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Full Scope 3 TWG Meetings (Year 2026)

Meeting #	Date TBC	Time	Topic
7	January	9-11 AM ET	Performance tracking (possibly review base year and target setting)
8	February	**4-6 PM ET**	TBD
9	March	9-11 AM ET	TBD
10	March	9-11 AM ET	TBD
11	April	**4-6 PM ET**	TBD
12	May	9-11 AM ET	TBD

* This is not a TWG meeting; it is the Secretariat's meeting with the ISB to present proposed revisions from the TWG

(Draft; for discussion)

Cross-cutting Series D revisions

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Pre-read

Cross-cutting considerations re: optional v. required boundaries

I. Require cradle-to-grave emission factors for fuels and/or energy (across all categories)
II. Required/optional inclusion of capital goods used to perform category activities
III. Remaining optional boundary activities across all categories (excluding categories 10 and 11)

* Based on member feedback from the post-Meeting 01 indicative survey (D Revisions - TWG member feedback.pdf)

(Draft; for discussion)

I. Require cradle-to-grave emission factors for fuels and/or energy (across all categories)

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Pre-read

I. **Require** cradle-to-grave EFs for fuels and/or energy (across all categories)

- **76%** believe that full life cycle emissions of fuels/energy across all scope 3 categories should be **required** *

- Estimated or actual fuel use by value chain partners in any scope 3 category reported by a reporting company **shall** include both the:
  - Cradle-to-gate (or well-to-tank) emissions **and**
    - (*the vendor's scope 3 category 3 emissions*)
  - Combustion-related (or tank-to-wheel) emissions
    - (*the vendor's scope 1 emissions)*

- Estimated or actual energy (including electricity, steam, heat, and cooling) used by value chain partners in any scope 3 category reported by a reporting company **shall** include both the:
  - Cradle-to-gate (or well-to-tank) emissions of fuels, if any, used to generate said energy
    - (*the vendor's scope 3 category 3 emissions*)
  - Combustion-related (or tank-to-wheel) emissions of of fuels, if any, used to generate said energy
    - *(the vendor's scope 2 emissions)*

* Based on member feedback from the post-Meeting 01 indicative survey (D Revisions - TWG member feedback.pdf)

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Pre-read

I. **Require** cradle-to-grave EFs for fuels and/or energy (continued)

- As presented in Meeting 03; see next slide for additional proposed text for Category 1 and Category 2

Category	REQUIRED	Notes
Category 1, 2, and 3	n/a	Should it be stated here as well?
Category 4, 9 Category 5, 12 Category 6 Category 7 Category 8 Category 10 Category 11 Category 13	"All upstream (cradle-to-gate) emissions of fuels and/or energy used by…" • [D4.3][D9.3] "… transportation and distribution providers." • [D5.2][D12.2] "… waste handlers." • [D6.5] "… transportation carries" • [D7.3] "… during employee commuting or remote work (the latter, if not included in category 1)." • [D8.3] "… leased assets." • [D10.3] "… customers." • [D11.3] "… end users." • [D13.3] "… lessees in leased assets."	
Category 14 and 15	n/a	Implied as it's required for investees

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Pre-read

I. Require cradle-to-grave EFs for fuels and/or energy (continued)

- The following revisions were added to clarify the inclusion of cradle-to-gate (i.e., well-to-wheel) emissions of fuels used by value chain partners to perform activities reported by a reporting company its scope 3

Category	REQUIRED	Notes
Category 1	**[D1.7]** "All upstream (cradle-to-gate) emissions of fuels and/or energy used by value chain partners to manufacture, distribute, and/or provide goods and/or services purchased by a reporting company."	Should [D1.7] and [D2.7] be specified for Category 1 and 2, respectively, to ensure cross-category consistency with the boundary extension introduced for other categories (previous slide)?
Category 2	**[D2.7]** "All upstream (cradle-to-gate) emissions of fuels and/or energy used by value chain partners to manufacture, distribute, and/or provide capital goods purchased by a reporting company."	
Category 3	No change.	Category 3 is defined as the upstream (cradle-to-gate) emissions associated with purchased fuel and/or energy.

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For discussion

Rev. D20.4 – Justified exclusion of cradle-to-gate emissions

- **Proposed language:**
  - "If a reporting company cannot find cradle-to-gate emission factors for fuels/energy and/or or is unable to determine whether emissions factors for scope 3 categories activities (including purchased goods and services) include the cradle-to-gate emissions (in addition to combustion-related emissions) of fuels/energy used thereby, then said company may use said emission factors subject to disclosure."

- Purpose:
  - In some instances:
    - Reporting companies that use secondary emission factors or supplier-specific emissions data (primary or secondary) may not be able to determine whether fuel/energy use is accounted for using cradle-to-gate *and* combustion or exclusively combustion-related emission factors; or
    - Reporting companies may be unable to find cradle-to-gate emission factors (data availability)
  - In such cases, the above justified exclusion of cradle-to-gate emissions is designed to permit that companies report scope 3 emissions that lack cradle-to-gate emissions (subject to disclosure)

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Pre-read

I. Require cradle-to-grave EFs for fuels and/or energy (continued)

- *The inclusion of capital goods used to extract, process, or transport fuels in the cradle-to-gate emissions of purchased fuels is considered on the next slide*
- *The inclusion of capital goods used to generate energy (e.g., solar facilities) in the cradle-to-gate emissions of purchased energy is considered on the next slide*

II. Required/optional inclusion of capital goods used to perform category activities

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Pre-read

II. Required/optional inclusion of to capital goods used for category activities

- Scope 3 TWG indicative polling (post-Meeting 01) may be inconsistent *
  - Regarding requiring the inclusion of "non-attributable" ** emissions associated with manufacturing or constructing the capital goods used to perform a category-specific activity or activities:
    - **77%** of members believe Category 3 should **require** inclusion for purchased fuels
    - **82%** of members believe Category 3 should **require** inclusion for purchased energy
    - **92%** of members believe Category 4 and 9 should **maintain optional** inclusion for T&D
    - **90%** of members believe Category 5 should **maintain optional** inclusion for waste handling
    - **85%** of members believed Category 6 should **maintain optional** inclusion for business travel
    - **77%** of members believe Category 13 should **require** inclusion for leased assets (by lessee)
  - However, regarding the inclusion of "non-attributable" ** emissions associated with manufacturing or constructing capital equipment used to perform any scope 3 activity, i.e., **cross-cutting**: *
    - **50%** of members believe the Standard should **require** inclusion for all scope 3 categories
    - **50%** of members believe the Standard should **maintain optional** inclusion for all scope 3 categories

* Based on member feedback from the post-Meeting 01 indicative survey (which did not achieve quorum) (D Revisions - TWG member feedback.pdf).

** Using the GHG Protocol *Product Standard* terminology: "Processes and services, materials and energy flows [that] are not directly connected to the studied product because they do not become the product, make the product, or directly carry the product through its life cycle."

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II. Required/optional inclusion of to capital goods used for category activities (continued)

- Requiring that lessees include emissions from constructing/manufacturing leased assets will be surveyed

Category	REQUIRED	OPTIONAL	Notes
Cat. 8	[D8.5] "Lessees **shall** report the upstream (cradle-to-gate) emissions* associated with manufacturing or constructing a leased asset(s) on an amortized basis, in proportion to the lessees' use of the leased asset (e.g., 100% if the lessee has full use, or a fraction if the lessee has partial use, e.g., in the case of multi-tenant leases)."	n/a	Lessees **shall** account for the leased asset manufacture or construction (amortized basis)
Cat. 13	[D13.4] "All emissions associated with manufacturing or constructing the leased assets (including vehicles, facilities, machinery, and other dedicated infrastructure), if not already included in category 2."	[D13.4] Footnote: "For ground leases (of land), the lessor **should** account for the life cycle emissions associated with construction or improvements financed by the lessee (in the year that said emissions occur)." **	Lessors will already have accounted for the leased asset manufacture or construction in **category 2**

* As defined in proposed revision D2.3 for Category 2. ** Because the lessor does not construct nor own the asset, therefore it may not be possible to require the inclusion; however, the lessor's income from the lessee is often tied to said lessee's construction of assets on the land.

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Pre-read

Justification for including embodied emissions of leased assets (Cat. 8)

- The embodied emissions of leased assets (including buildings, vehicles, and other equipment) is well understood to account for a sizeable fraction of the lifetime emissions of the leased asset
- Examples
  - Buildings (especially high-rise):
    - "While the average share of embodied GHG emissions from buildings… is approximately 20–25% of life cycle GHG emissions, this figure escalates to 45–50% for highly energy-efficient buildings and surpasses 90% in extreme cases." *
    - Embodied emissions increases significantly with taller buildings **
  - Market of leased office/industrial space
    - Anchor tenants (lessees) are often critical for the financing and initiation of large-scale developments
    - Primary market data on property statistics isn't widely available, but some estimate that >66% of companies that occupy office/industrial space do so via leasing or renting
  - ICE vehicles vs. EVs
    - Embodied emissions of Polestar 2 (EV) versus Volve XC40 (ICE) was 85% higher due to the battery pack

* Meta-analysis of 650 LCA case studies (https://doi.org/10.1016/j.apenergy.2019.114107)

** https://doi.org/10.1080/09613218.2018.1479927

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Pre-read

II. Required/optional inclusion of to capital goods used for category activities (continued)

- "All upstream (cradle-to-gate) emissions associated with manufacturing or constructing capital goods used in…"

Category	REQUIRED OR OPTIONAL
Cat. 1; 2	[D1.2] "… production of goods and services… "; [D2.3] "… capital goods… "
Cat. 3	(a) [D3.4] "… purchased fuels" (b) [D3.4] "… fuels consumed in the generation of purchased energy" and/or [D3.5] "… to generate purchased electricity or other forms of purchased energy" (c) [D3.4] "… fuels lost or consumed in a T&D system" and/or [D3.5] "… to generate electricity or other forms of energy lost or consumed in a T&D system" (d) [D3.5] "… to generate electricity or other forms of energy sold to end users"
Cat. 4 and 9 Cat. 5; 12 Cat. 6 Cat. 7	[D4.4] "… transportation and distribution" [D5.3] "… waste handling"; [D12.2] "… waste handling" [D6.6] "… business travel" [D7.4] "… employees for commuting"
Cat. 10, 11	Not considered
Cat. 14, 15	n/a

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Pre-read

Literature for pre-read (refer to Appendix C for citations)

- **(Frischknecht, et al., 2007)**: (Sharepoint)
  - "Capital goods must be included in the assessment of climate change impacts of non-fossil electricity, agricultural products and processes, transport services and waste management services."
  - "… capital goods may be excluded when analysing fossil-fueled electricity, and metals…"
  - "The mixing of datasets including and excluding capital goods is no problem as long as their share on total impacts is low and partial omissions do not lead to a significant imbalance in comparative assertions."
- **(Liang, et al., 2022)**: (Sharepoint)
  - For a sample of collected cases: "… the operational process accounts for the largest share of building LCCEs, averaging 67%, followed by the production and construction phase, averaging 31%."
- **(Wang, et al., 2018)**: (Sharepoint)
  - "The discrepancy in the results [for medium-density fiberboard or MDF] can be attributed to different methodological issues... [including] the… inclusion or exclusion of capital goods, and other boundary issues…"
- **(Nugent and Sovacool, 2024)**: (Sharepoint)
  - This study* "… finds a range of emissions intensities… from a low of 0.4 g CO_2-eq/kWh to a high of 364.8 g CO_2-eq/kWh for wind energy, with a mean value of 34.11 g CO_2-eq/kWh. For solar energy, it finds a range of 1 g CO_2-eq/kWh to 218 g CO_2eq/kWh, where the mean value is 49.91 g CO_2-eq/kWh."
- **(Mahlan, et al., 2025)**: (Sharepoint)
  - "Data uncertainty and complexity remain major concerns regarding capital goods inclusion in LCAs. This study suggests the optimal approach to accessing reliable capital goods data entails a multifaceted process: a process encouraging rigorous primary data collection through implementing advanced technologies and uncertainty analyses techniques alongside continuous existing database upgradation to minimise uncertainty and enhance reliability and comprehensiveness of LCA outcomes."

* "This study has screened 153 lifecycle studies of greenhouse gas equivalent emissions for wind turbines and solar panels to identify a subset of the 41 most relevant, current, peer-reviewed, original, and complete assessments" (p. 12, section 7. Conclusions)

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For discussion

II. Required/optional inclusion of capital goods used for category activities (continued)

The following decision-making criteria (DMC) analysis is provided for members to consider the option to **require** "non-attributable"* capital goods in the minimum boundary of all scope 3 categories (Option 1):

DMC analysis (source)	Option 1: **Require** for **all**	Option 2: **Optional** for **all**	Option 3: **Require** for **some**
1A. Scientific integrity	• Most scientific as some category emissions are significant (by magnitude)	• Least scientific as some companies may exclude significant (by magnitude) emissions	• More scientific if categories for which these emissions are significant (by magnitude) are included (required)
1B. GHG accounting and reporting principles	• Most complete, consistent, relevant, and transparent	• Not complete • Less transparent • May be inconsistent; exclude relevant	• May be complete • Improves consistency, relevance, and transparency
2A. Support decision making that drives ambitious global climate action	• Value chain activities that are capital-intensive and/or GHG-intensive capital goods would be identified/acted upon	• Value chain activities that are capital-intensive and/or GHG-intensive capital goods would/could be ignored	• Some (not all) capital-intensive and/or GHG-intensive capital goods used for value chain activities would be identified
2B. Support programs based on GHG Protocol and uses of GHG data	• The 5% exclusion threshold and de minimis provision could support harmonization	• Harmonizes with ISO 14064-1/14067 (materiality-based) & EU PEF/PEFCRs (if "relevant & significant") *	• Could harmonize with ISO 14064-1/14067 and EU PEF/ PEFCRs in many cases, though not entirely
3. Feasibility to implement	• Data uncertainty, complexity, and limited availability of both primary & estimated data	• Least challenging; companies with primary data or capacity to estimate may include; otherwise excluded	• May still be challenging for some (all) of the required categories; less for the optional categories

Using the GHG Protocol *Product Standard* terminology: "Processes and services, materials and energy flows [that] are not directly connected to the studied product because they do not become the product, make the product, or directly carry the product through its life cycle." The options and preliminary comparisons herein are not designed to be final, complete, or all-encompassing.

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Pre-read

Rec. D20.3 - Dedicated infrastructure

- **Proposed definition:**
  - "Any and all infrastructure, the manufacture/construction and use of which, is solely for (dedicated to) the category-specific activity(ies). For the avoidance of doubt, infrastructure that is owned by a value chain partner is considered a capital good(s), the use of which shall be allocated, if included." *

- Issue:
  - Infrastructure is a capital good in economic terms (i.e., a long-lived, man-made assets, e.g., roads, bridges, power grids, railways, pipelines, data centers, water systems)
    - These assets enable production, transport, and communication (etc.) by value chain partners
  - However, many if not most infrastructure is *not* owned nor controlled by value chain partners
    - In financial accounting, a company can only capitalize assets they own or control
- Solution:
  - Set the boundary for including infrastructure that is *not* owned by value chain partners as: infrastructure that is solely for (dedicated to) a value-chain partner's category-specific activities
  - A company that owns or operates (controls) infrastructure *would* treat is as capital goods **

* If including capital goods used for some or all scope 3 category activities is required (or optionally included), then companies would be required to allocate the emissions methodologically. ** Given that the company would capitalize said infrastructure as capital good.

(Draft; for discussion)

3. Remaining optional boundary activities across all categories (excluding categories 10 and 11)

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Pre-read

3. Remaining optional boundary activities across all categories (excl. cat. 10)

- All remaining optional boundary activities across all scope 3 categories, excluding (I) fuel/energy and (II) capital goods as presented previously (excluding category 10)

Category	Optional boundary activities
Category 1, 2, 3, 4, 5, 6, 7, and 8	*N/A (for all said categories, the cradle-to-gate emissions of (I) fuel/energy and (II) capital goods used for activities thereof, is presented in the previous slides.)*
Category 9	[D9.4] "The scope 1, scope 2, and upstream (cradle-to-gate) emissions of fuels and/or energy that occur during the use of vehicles by customers traveling to and from retail stores or other locations to purchase the product(s) of a reporting company."
Category 11	[D11.4] "The indirect use-phase emissions of sold products over their expected lifetime (i.e., emissions from the use of products that indirectly consume energy (fuels or electricity) during use)"
Category 12, 13, 14, and 15	*N/A (no optional boundary activities; note that category 10 remains to be considered*)*
Category 16	16.1.2 (insurance payment claims); 16.3 (other financial activities and services); 16.4 (licensing); 16.6 (all other facilitated activities) (some facilitated activities are required**)

* Category 10 to be considered at a later point. ** The following Category 16 facilitated activities are proposed to be required: 16.1.1 (insurance-associated emissions); 16.2 (underwriting and issuance emissions); and 16.5 (distribution/transportation of oil and gas).

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Pre-read

Implications summary

- If both (I) cradle-to-gate emissions of fuels/energy and (II) capital goods used to perform activities in scope 3 categories are **required**, then:
- Only (III) Categories 9, 11, and 16 have **optional** boundary activities (as detailed on previous slide)
- All other categories are required*

- Category 11 delineation to be considered in Meeting 05
  - Direct activities
  - Indirect activities

* Category 10 and Category 15 activities are required despite the fact that companies may exclude them subject to justification (a justified exclusions is not equivalent or synonymous with optionality)

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For discussion

Rev. D20.1 – Prudence requirement for boundary interpretation

- **Proposed language:**
  - "In any instance where an activity could reasonably be interpreted as falling within both a required *and* optional boundary (within a category or between categories), the reporting company **shall** classify and report the activity within a required boundary thereof. If there remains ambiguity after reasonable evaluation, the company shall document the rationale for its classification and disclose the basis for its decision, prioritizing completeness and alignment with required boundaries."

- Purpose:
  - This rule is designed to support classification in instances where an activity could fall in both a required and optional boundary of one or more categories

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For discussion

Rev. D20.2 – Exception to disaggregation rule for required/optional emissions

- **Proposed language:**
  - "If a reporting company uses emission factors or emissions data and is unable to distinguish or disaggregate required vs. optional scope 3 boundary emissions therein, then the company may report the optional boundary scope 3 emissions in the required boundary scope 3 emissions."

- Purpose:
  - This rule is designed to support classification and reporting in instances where a reporting company is unable to disaggregate optional vs. required boundary emissions
  - It is expected that these instances won't be common OR (if they are) that the optional emissions included in the required emissions boundary will most commonly be small in magnitude
  - In instances where optional emissions are expected to or do account for a large fraction of required vs. optional boundary emissions – it is expected that a reporting company should be able to disaggregate said optional emissions (given their relative magnitude)

(Draft; for discussion)

Category 11
Sold product annualization

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Pre-read

Current requirements on lifetime vs. amortized emissions

- **Capital goods**:
  - "[…] companies **should not depreciate, discount, or amortize** the emissions from the production of capital goods over time. Instead companies should account for the total cradle-to-gate emissions of purchased capital goods in the year of acquisition, the same way the company accounts for emissions from other purchased products in category 1." (Box 5.4, p. 39)
- **Sold products**:
  - "Because the scope 3 inventory accounts for total lifetime emissions of sold products, companies that produce more durable products with longer lifetimes could appear to be penalized because, as product lifetimes increase, scope 3 emissions increase, assuming all else is constant. **To reduce the potential for emissions data to be misinterpreted, companies should also report relevant information such as product lifetimes and emissions intensity metrics to demonstrate product performance over time. Relevant emissions intensity metrics may include annual emissions per product, energy efficiency per product, emissions per hour of use, emissions per kilometer driven, emissions per functional unit, etc.**" (Box 5.8, p. 49)

Current guidance on reporting of historic and future scope 3 emissions

- **11.2 Optional information (p. 122)**
  - "Historic scope 3 emissions that have previously occurred, reported separately from future scope 3 emissions expected to occur as a result of the reporting company's activities in the reporting year (e.g., from Waste generated in operations, Use of sold products, End-of-life treatment of sold products)"
- **11.3 Reporting guidance (p. 124)**
  - "Optional reporting: Historic scope 3 emissions that have previously occurred, reported separately from future scope 3 emissions expected to occur as a result of the reporting company's activities in the reporting year
    - Emissions reported for category 5 (Waste generated in operations), category 11 (Use of sold products), and category 12 (End-of-life treatment of sold products) should not be interpreted to mean that emissions have already occurred, but rather that the reported emissions are expected to occur as a result of activities that occurred in the reporting year.
    - Companies may separately report historic emissions (that have already occurred) from future emissions (that have not yet occurred) in order to avoid misinterpretation by stakeholders"

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Pre-read

Category 11 (current standard): activity-driven boundary delineation

- Account for and report:
  - All downstream ("total expected lifetime" emissions in the year that a product is sold (activity))
  - Effectively, the gate-to-grave emissions of **goods and services sold** (activity) by a company

- The above mirrors Category 1
  - All upstream (cradle-to-gate) emissions of **goods and services purchased** (activity) by a company

- Combining Category 11 and Category 1
  - This yields the full life cycle (cradle-to-grave) emissions of the company's activities

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Pre-read

Alternative approach: emissions-driven boundary delineation for Cat. 11

- Account for and report:
  - All 'in-year' emissions from the use of all products in circulation
- This may *not* mirror Category 1
  - All upstream (cradle-to-gate) emissions of goods and services purchased (activity) by company
- Combining Category 11 and Category 1
  - Possibly results in a *proxy* for the full life cycle (cradle-to-grave) emissions of the company's activities (see Appendix D)
    - This is partially a company-perspective (Category 1); and
    - Partially a product-perspective (Category 11)

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Pre-read

Comparison of current vs. alternative approach

1. Cumulative vs. annualized – generally shows about the **same total year-over-year**
   - Emissions-driven approach would indirectly (non-intuitively) serve as a proxy for the lifetime emissions of sold products, despite only reporting the emissions of products in circulation
   - Activity-driven approach more intuitively represents the projected lifetime emissions of sold products (despite the estimation uncertainty or variability)
2. The **impact** of changing product design, selling low-carbon products, or changing the portfolio of sold products would ***not*** be clear or apparent for the emissions-driven approach
   - The impact of changing product design, selling low-carbon products, or changing the portfolio of sold products ***would be clear*** and apparent using the current (activity-driven) approach
3. Regardless of the method:
   - Only per unit (i.e., per sold product) metrics effectively show potential efficiency gains (e.g., from durable products), for example, the GHG-intensity or unit product use (a metric)

- Refer to Appendix D for examples

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For discussion

Decision-making criteria for Category 11 *

- **Option 1: Activity driven** – Report cumulative category 11 emissions in the year that a product is sold
- **Option 2: Emissions driven** – Report category 11 emissions occurring in the reporting year (emissions-driven) resulting from product sales that occurred in previous years and the present year

Illustrative example	**Option 1: Activity-driven**	**Option 2: Emissions-driven**
1A. Scientific integrity	• Cons: Somewhat less scientific	• Pros: More scientific as emissions are accounted in the year they are emitted
1B. GHG accounting and reporting principles	• Pros: Transparent, complete, consistent, accurate, relevant	• Pros: Similarly transparent, complete, transparent, accurate, relevant
2A. Support decision making that drives ambitious global climate action	• Pros: Shifting product portfolio is reflected immediately • Cons: Durable products disincentivized • Pros: Re-baselining would be easier	• Cons: Companies would not see the benefit of changing their products design. • Durable products disincentivized • Re-baselining would be challenging
2B. Support programs based on GHG Protocol and uses of GHG data	• Pros: Harmonizes with other standards and with the *Product Standard*	• Cons: Would not harmonize with other standards not with the *Product Standard*
3. Feasibility to implement	• Pros: No hassle maintaining records • Cons: Sometimes difficult to estimate	• Cons: More complicated to collect emissions data and maintain records

* The options and preliminary comparisons herein are not designed to be final, complete, or all-encompassing.

(Draft; for discussion)

Category 11 metrics

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For discussion

Should the Scope 3 Standard require metrics?

- To support effective category 11 emissions disclosure:
  - Consider **requiring** current and/or **adding further** sold product metrics for disclosure

- Current Scope 3 Standard metrics language:

  - Box 5.7 (Scope 3 Standard, p. 50)
    - Lifetime emissions per product, corporate average emissions (kg CO2e/km)
    - *Non-emissions metrics: fuel economy (e.g., km per liter)*

  - Box 5.8 (Scope 3 Standard, p. 50)
    - Annual emissions per product, emissions per kilometer driven, emissions per functional unit)
    - *Non-emissions metrics: energy efficiency per product*

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For discussion

Should the Scope 3 Standard require metrics? (continued)

Scope 3 Standard (p. 122)

Section: "Optional reporting: Information on product performance"

"To provide appropriate context related to category 11 (Use of sold products), a public GHG emissions report should include, when applicable, the following additional information:

- Product performance indicators and intensity metrics (e.g., average GHG intensity of sold products, average energy efficiency of sold products, average emissions per hour of use, average fuel efficiency of sold vehicles, average emissions per kilometer driven, GHG intensity of sold fuels, average emissions per functional unit, etc.)
- Annual emissions from the use of sold products (i.e., emissions that occur in a single year from products sold in the reporting year)
- Average lifetime/durability of sold products
- The methodologies and assumptions used to calculate product performance indicators and intensity metrics
- The percentage of sold products that are compliant with standards, regulations, and certifications, where applicable
- A statement explaining why emissions from category 11 (Use of sold products) have increased or decreased over time
- Any sold products not included in the inventory, with justification for their exclusion
- Other relevant information"

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For discussion

Should the Scope 3 Standard require metrics? (continued)

- Questions:
  1. Should any of the metrics (currently defined in the Standard) be required
  2. Should any additional metrics be added (required or optional)
  3. Optionality: Should the disclosure of metrics be required or optional?

- Note: Metrics for a company's entire (Scope 1, 2, and 3, and/or multiple scope 3 categories) will be discussed next year when discussing performance tracking

(Draft; for discussion)

Category 2

Amortization of remaining unamortized emissions of capital goods

Category 8

Method by which to amortize the embodied emissions of leased assets (Category 8)

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Pre-read

Proposal summary

- Category 2 will always report a cumulative* emissions figures
  - This cumulative figure will *net* out cumulative amortized emissions to-date
    - Total (cumulative) cradle-to-gate emissions less total (cumulative) amortized cradle-to-gate emissions = net, i.e., remaining, unamortized emissions

** For clarity: The following proposed revision is **not** proposing that Category 2 emissions be reported on an annualized basis*

- Only Category 8 will report an *annualized* emissions figure
- Refer to **Appendix A** and **Appendix B**

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Pre-read

Summary of proposed amortization rules

- **Category 2 (total and amortized)**
  - [D2.4][D2.5]
    - Reporting companies **shall** report **total** remaining unamortized upstream (cradle-to-gate) emissions of capital goods
    - Reporting companies **may** report **amortized** emissions (as a metric alongside their inventory) *
- **Category 8 (only amortized)**
  - [D8.5] Lessees **shall** report the upstream (cradle-to-gate) emissions associated with manufacturing or constructing a leased asset(s) **amortized**, in proportion to the lessees' use of the leased asset
    - *This corresponds with Option 1 of Appendix A*
- **Category 13 (n/a)**
  - [D13.4] n/a (see Category 2 below)

- **Other scope 3 \categories:**
  - The inclusion of capital goods used in the various other scope 3 categories activities (see section II herein, slides 18-25*) directly or indirectly necessitates the use of allocated and therefore (in most if not all cases) amortized upstream (cradle-to-gate) emissions from manufacturing/constructing capital goods used to perform said activities, per expected unit of output over the lifespan of use of the capital good**

* D1.2] "… production of goods and services…", [D2.3] "… manufacture or construction of capital goods…", [D3.4] "… purchased fuels…", [D3.5] "… to generate purchased electricity or other forms of energy…", [D4.4] "… transportation and distribution…", [D5.3][D12.2] "… waste handling…", [D6.6] "… business travel", [D7.4] "… employees for commuting…" ** E.g., the emissions from constructing a solar PV array is allocated per *projected* kWh generated (unit output) over the lifespan of operation of the asset

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Pre-read

Category 2) Remaining unamortized emissions of capital goods

- **Proposed revision [D2.4]:**
  - "The (1) total remaining unamortized emissions of purchased second-hand (or used) capital goods **shall** be accounted for in the year that the capital good is purchased; and (2) amortized and accounted for on a pro-rata (straight-line) basis, reflecting both (a) the expected useful life of the capital good and (b) the years of use prior to purchase. *
  - Companies **shall** determine the expected useful life of a capital good using recognized accounting standards (e.g., GAAP, IFRS, or jurisdictional equivalents) or their own best estimate, provided it is reasonable, supportable, and consistent with internal depreciation practices used for financial reporting. Useful life assumptions **shall not** be shorter than those applied in the reporting company's audited financial accounts for the same or similar assets.
  - If a capital good remains in use beyond its expected useful life and its embodied emissions have been fully amortized, the annual allocation (amortization) **shall** be zero for those years."

* "For example, if (a) the upstream (cradle-to-gate) emissions associated with manufacturing a vehicle is 10 tCO2e, (b) the expected lifespan of the vehicle is ten (10) years, and (c) the vehicle was purchased second-hand after three (3) years of use by the original purchaser—then the reporting company (as the second-hand purchaser) would account for 7 tCO2e emissions in scope 3 category 2 for said purchased second-hand vehicle. For example, if (a) the upstream (cradle-to-gate) emissions associated with constructing a building is 10,000 tCO2e, (b) the expected lifespan of the building is fifty (50) years, and (c) the building was purchased from the original owner after ten (10) years of use by the original owner—then the reporting company (as the second-hand purchaser) shall account for 8,000 tCO2e emissions in scope 3 category 2 for said purchased second-hand building."

* https://www.mordorintelligence.com/industry-reports/used-construction-equipment-market

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Pre-read

Category 2) Includes second-hand (used) capital goods

- **Proposed definitions [D2.4]:**
  - **Remaining unamortized emissions**: The portion of embodied emissions (refer to definition below) associated with a capital good or long-lived asset that has not yet been allocated (through amortization) over its expected useful life (as defined by the reporting company); in other words, the remaining balance of embodied emissions to be recognized in future reporting periods.
  - **Embodied emissions**: All upstream (cradle-to-gate) GHG emissions from raw material extraction, manufacturing, transport, installation, and capitalized repair and maintenance of capital goods, as well as waste handling of associated upstream activities. These emissions may occur at any point over the lifespan of a capital good. For the avoidance of doubt, non-capitalized activities and operational activities (e.g., use-phase energy consumption) are excluded from embodied emissions.

* https://www.mordorintelligence.com/industry-reports/used-construction-equipment-market?utm_source=chatgpt.com

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Pre-read

Category 2) Includes second-hand (used) capital goods (continued)

- See previous slide regarding justification for including embodied emissions of leased asset (Cat. 8)
- Regarding second-hand (used) capital goods and turnover rates:
  - Data on turn-over rates of commercial/industrial buildings is not widely available
    - However, it is the case that buildings are often constructed by a developer, sold to a property owner, and often resold to another property owner(s)
  - Used construction equipment is a $125BN+ market growing rapidly *
  - Many companies lease equipment/vehicles and the lessors may and do sell said equipment/vehicles second-hand at the end of the lease period(s)

* https://www.mordorintelligence.com/industry-reports/used-construction-equipment-market?utm_source=chatgpt.com

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Pre-read

Relisted: Literature for pre-read (refer to Appendix C for citations)

- **(Frischknecht, et al., 2007)**: (Sharepoint)
  - "Capital goods must be included in the assessment of climate change impacts of non-fossil electricity, agricultural products and processes, transport services and waste management services."
  - "… capital goods may be excluded when analysing fossil-fueled electricity, and metals…"
  - "The mixing of datasets including and excluding capital goods is no problem as long as their share on total impacts is low and partial omissions do not lead to a significant imbalance in comparative assertions."
- **(Liang, et al., 2022)**: (Sharepoint)
  - For a sample of collected cases: "… the operational process accounts for the largest share of building LCCEs, averaging 67%, followed by the production and construction phase, averaging 31%."
- **(Wang, et al., 2018)**: (Sharepoint)
  - "The discrepancy in the results [for medium-density fiberboard or MDF] can be attributed to different methodological issues... [including] the… inclusion or exclusion of capital goods, and other boundary issues…"
- **(Nugent and Sovacool, 2024)**: (Sharepoint)
  - This study* "… finds a range of emissions intensities… from a low of 0.4 g CO_2-eq/kWh to a high of 364.8 g CO_2-eq/kWh for wind energy, with a mean value of 34.11 g CO_2-eq/kWh. For solar energy, it finds a range of 1 g CO_2-eq/kWh to 218 g CO_2eq/kWh, where the mean value is 49.91 g CO_2-eq/kWh."
- **(Mahlan, et al., 2025)**: (Sharepoint)
  - "Data uncertainty and complexity remain major concerns regarding capital goods inclusion in LCAs. This study suggests the optimal approach to accessing reliable capital goods data entails a multifaceted process: a process encouraging rigorous primary data collection through implementing advanced technologies and uncertainty analyses techniques alongside continuous existing database upgradation to minimise uncertainty and enhance reliability and comprehensiveness of LCA outcomes."

* "This study has screened 153 lifecycle studies of greenhouse gas equivalent emissions for wind turbines and solar panels to identify a subset of the 41 most relevant, current, peer-reviewed, original, and complete assessments" (p. 12, section 7. Conclusions)

For discussion

Decision-making criteria for Category 2 (capital goods)*

- **Option 1: Current standard** – Box 5.4 says that "companies **should not** depreciate, discount, or amortize the emissions from the production of capital goods over time" (including of 'virgin' or second-hand/used capital goods)
- **Option 2: Amortization** – Embodied emissions of capital goods **shall** be amortized (including second-hand/used)

Illustrative example	**Option 1: Total emissions**	**Option 2: Unamortized emissions**
1A. Scientific integrity	• n/a	• n/a
1B. GHG accounting and reporting principles	• Pros: Accuracy, completeness, transparency are satisfied • Pro/Con: **Relevance** may be **challenged** • Cons: **Consistency** (meaningful tracking over time) is **challenged**	• Pros: Accuracy, completeness, transparency, completeness are satisfied • Pro/Con: **Relevance** may be **improved** • Pros: **Consistency** is **improved** to enable meaningful performance tracking over time
2A. Support decision making that drives ambitious global climate action	• Cons: Excluding used capital goods may not support the accounting and reporting of capital goods with extended lifespans	• Pros: Including used capital goods may not support the accounting and reporting of capital goods with extended lifespans
2B. Support programs based on GHG Protocol and uses of GHG data	• Pros: Harmonizes with SBTi and current drafts of other standards	• Cons: May not harmonize with SBTi and other construction-specific standards
3. Feasibility to implement	• Pros: Easier to quantify emissions from newly constructed/manufactured capital goods	• Cons: May be challenging to quantify emissions from second-hand capital goods; data availability is an issue

* The options and preliminary comparisons herein are not designed to be final, complete, or all-encompassing. ** Every buyer in year 1, 10, 25, 50, …, n therefore shall account for 100% of the cradle-to-gate emissions of a purchased capital good (irrespective of the year or second-hand/used nature of the capital good)

For discussion

Decision-making criteria for Category 8 (leased assets)*

- **Option 1: Current standard** – Life cycle emissions from construction/manufacturing leased asset is **optional**
- **Option 2: Amortization** – Lessees **shall** account for the ***amortized*** embodied emissions of leased assets

Illustrative example	**Option 1:** **Optional** inclusion of amortized emissions	**Option 2:** **Required** inclusion of amortized emissions
1A. Scientific integrity	• n/a	• n/a
1B. GHG accounting and reporting principles	• Pros: The exclusion of leased asset construction or manufacture is less complete, transparent, and relevant	• Pros: The inclusion of leased asset construction or manufacture is more complete, transparent, and relevant
2A. Support decision making that drives ambitious global climate action	• Cons: Excluding manufacture of leased asset may not support action by companies and/or disregards material emissions	• Pros: Including manufacture of leased asset may better support action by companies, including by reporting material emissions
2B. Support programs based on GHG Protocol and uses of GHG data	• Pros: All other current standards let lessees optionally include said emissions	• Cons: No other current standard or framework mandates that lessees include said emissions
3. Feasibility to implement	• Pros: Optionality makes this a non-issue	• Cons: May be challenging for lessees to quantify said emissions and data availability remains a challenge

*The options and preliminary comparisons herein are not designed to be final, complete, or all-encompassing.

(Draft; for discussion)

A1. Disaggregation by specificity

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Pre-read

TWG updates to revision A1. Disaggregation

The following updates will be included in the end-of-year public documentation with revisions to date:

- **A1a. Additional tier proposed in collaboration with the Corporate Standard TWG:**
  - Addition of a "measured" tier (71% support*) **
    - Most (**91%**) of Scope 3 TWG members support the "measured" tier for **scope 1** emissions
    - Most (**71%**) of Scope 3 TWG members support the "measured" tier for **scope 3** emissions
  - Definition of "measured" tier has yet to be reviewed by the Corporate Standard TWG (next year)
    - ISO's definition of primary data received most support (i.e., "quantified value of a process or an activity obtained from a direct measurement or a calculation based on direct measurements")
    - This will be finalized next year (1H26) with the Corporate Standard TWG
    - The public will be informed of as much in the EOY public documentation
- **A1b. Editorial revisions that will be proposed:**
  - Rename "unknown/unclassified" tier to "**unclassified**" (100% support*)
  - Rename "non-specific" tier to "**partially specific**" (84% support*)

* Based on a Scope 3 TWG member survey completed by 24 members (which does ***not*** constitute a quorum). ** This would result in five tiers: (1) Measured; (2) Specific; (3) Partially specific; (4) Spend-based/EEIO; and (5) Unclassified.

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For discussion

Final reporting requirement(s) for disaggregated scope 3 emissions

- Some disaggregation polls from Meeting 03 were ***not*** conclusive
- These items will be polled following this meeting and must completed by November 7th to finalize Phase 1.
- The following outstanding items remain:
  1. **Proposal**: Disaggregate **all scope 3 categories** *
     - Support, oppose, abstain
  2. **Proposal**: Disaggregate **all sub-categories** *
     - Support, oppose, abstain
  3. **Proposal**: Disaggregate **all optional boundary emissions** *
     - Support, oppose, abstain
  4. **Consideration**: **Format of disclosure**
     - Disaggregation (for each category, etc.) shall be reported via (i) tCO2e, (ii) percentages, or (iii) either
     - Companies shall report % emissions by disaggregated tier for the entire scope 3 inventory **
  5. **Consideration**: "A reporting company may report scope 3 category emissions **sub-totals** in a smaller, consolidated table *without* disaggregation – if and only if the company reports and makes publicly available *disaggregated* scope 3 category emissions data **separately** (e.g., via a **supplementary annex**)"
     - Yes, No, Abstain

* The Secretariat recommends requiring disaggregation across all scope 3 categories for consistency, readability, prescriptiveness, and requirement simplicity (in terms of standard language and interpretability). ** I.e., 10% specific, 10% partially specific, 50% EEIO/spend-based, and 30% unclassified

Revision D30: Sub-categories

- Consider whether and which categories should or will have sub-categories (beyond Category 15 and Category 16) which currently *do* have sub-categories

- This will be discussed in Meeting 05mefer to: Category disaggregation

(Draft; for discussion)

Next Steps

Next steps

- GHG Protocol Secretariat:
  - Distribute the Recording
  - Distribute Meeting Minutes and the Feedback Form

- Next meeting:
  - November 20th – **Meeting 5** at 4-6 PM EST

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Thank you!

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(Draft; for discussion)

Appendix A.
Amortization options for Category 8

Cat. 8) Option 1. Lessee to report leased asset construction amortized

- **Issue:**
  - Lessees have no calculation method to quantify emissions from constructing leased assets
- **Proposed solution (Option 1): Amortization**
  - Require that lessees account for **proportionate upstream (cradle-to-gate) emissions** associated with leased assets (including buildings, machines, equipment, etc.)
- Example:
  - A building that incurred 10,000 tCO2e during construction with a 50-year expected useful life; and a lessee that rents 25% of the rentable square footage (RSF) for a 10-year lease in the period year 30-40 of the building's useful life would account for leased asset emissions as follows:
    - 10,000 tCO2e / 50 years = 200 tCO2e per year (amortized emissions from construction)
    - 200 tCO2e x 25% = 50 tCO2e amortized emissions allocable to the lessee (tenant)

- See **Appendix B** for an example and proposed calculation method for amortizing capital improvements
  - Appendix B is not for discussion in this meeting
  - Specific text will be reviewed subject to time or asynchronously (via comments file or a survey)

Cat. 8) Option 2. Lessee to report leased asset construction upfront (Cat. 8)

- **Proposed solution (Option 2): Upfront**
  - Account for **proportionate upstream (cradle-to-gate) emissions** associated with constructing or manufacturing the leased asset **upfront** in the year that the lease starts
- Example:
  - Lessee rents 25% of the RSF of a building for a 10-year lease; the building has an expected lifespan of 50 years; construction caused 10,000 tCO2e; the lessee could report either:
    - **Proportionate emissions, Upfront** (i.e., 50 tCO2e x 10 years = 500 tCO2e in year 1); **OR**
    - **Proportionate emissions, Amortized** (i.e., 50 tCO2e per year for 10 years) (see previous slide)
- Pros:
  - This option could be simpler (feasibility)
  - It could let companies control forward-year emissions (e.g., record all emissions in year 1 to achieve greater reduction versus a year 0 or year 1 baseline)
  - Capital improvements could likewise be recorded in the year they are performed

Cat. 8) Option 3. Lessee to report either amortized or upfront (Cat. 8)

- Option 3:
  - Let companies (lessees) report emissions either (Option 1) amortized **OR** (Option 2) upfront

- Cons:
  - The optionality may result in widely varying emission reported by companies that lease assets (possibly negatively impacting accounting and reporting principles)
- Pros:
  - This improves feasibility

Appendix B.
Method by which to amortize the embodied emissions of leased assets (Category 8)

Note

- Appendix B is not for discussion in this meeting
- Specific text will be reviewed subject to time or asynchronously (via comments file or a survey)

Landlords to amortize emissions of additional capital activities (continued)

- **Issue:**
  - Landlords often incur capital expenses (e.g., repair & maintenance, tenant improvements, and other activities) **during** a tenant's (lessee's) occupation of a space
    - These activities are capital goods with varying depreciation schedules and effective years of use
    - Some impact all lessees (e.g., lobby renovations)
    - Some are dedicated (e.g., tenant improvements)
  - Lessees have no calculation method to quantify emissions of capital expenses *during* a lease
- **Proposed solution:**
  - Require that landlords effectively 'capitalize' said emissions from on-going capital expenses
    - I.e., add them to the upstream (cradle-to-gate) emissions of the capital good ***annually***
    - E.g., a landlord constructs a building using 10,000 tCO2e and incurs 250 tCO2e R&M in year 2
      - This would result in 10,250 tCO2e to be amortized in year 3 onwards *
      - The capital improvement may have a different lifespan of use
  - The landlord may use useful lifespan in accordance with its financial accounting practices; or rely on estimates **
  - Require that tenants (lessees) account for all upstream (cradle-to-gate) emissions ***to date***
    - E.g., tenant with 25% RSF would in year 2 account for 50 tCO2e amortized emissions ***
    - E.g., tenant would in year 3 account for 50 tCO2e plus 6.25 tCO2e = 56.25 tCO2e amortized emissions ^
      - 10,000 tCO2e / 50 years = 200 tCO2e per year x 25% = 50 tCO2e allocation to the lessee (tenant)
      - 250 tCO2e / 10 years = 25 tCO2e per year x 25% = 6.25 tCO2e allocation to lessee (tenant)

* For example, if a new HVAC repair is expected to have a 10-year lifespan of use, then the 250 tCO2e would be 25 tCO2e amortized. ** Subject to disclosure. *** 10,000 tCO2e / 50 years = 200 tCO2e. ^ For shared capital improvements

Amortization of building

- Landlord constructs building in year 0 causing 10,000 tCO2e with an expected useful life of 50 years
- Tenant rents 25% of rentable square footage (RSF) in year 3 for a 10-year lease

Index year	0	1	2	3	4	5	6	7	8	9	10
Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Landlord											
Construction (Category 2)	**10,000**										
Years of use	50										
Amortization		200	200	200	200	200	200	200	200	200	200
Total Amortization		200	200	200	200	200	200	200	200	200	200
Tenant											
Lease period (years)	10										
Tenants % rentable sq. foot	25%										
Start year	2027										
End year	2036										
% RSF			25%	25%	25%	25%	25%	25%	25%	25%	25%
Leased asset (Category 8)			**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**

Amortization of building

- Landlord performs (common space) capital improvements causing 250 tCO2e with a useful life of 10 years*

Index year	0	1	2	3	4	5	6	7	8	9	10
Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Landlord											
Construction (Category 2)	**10,000**										
Years of use	50										
Amortization		200	200	200	200	200	200	200	200	200	200
Capital improvement (Category 2)			**250**								
Years of use			10								
Amortization				25	25	25	25	25	25	25	25
Total Amortization		200	200	225	225	225	225	225	225	225	225
Tenant											
Lease period (years)	10										
Tenants % rentable sq. foot	25%										
Start year	2027										
End year	2036										
% RSF			25%	25%	25%	25%	25%	25%	25%	25%	25%
Leased asset (Category 8)			**50**	**56.25**	**56.25**	**56.25**	**56.25**	**56.25**	**56.25**	**56.25**	**56.25**

* For example, if a new HVAC repair is expected to have a 10-year lifespan of use, then the 250 tCO2e would be 25 tCO2e amortized.

Amortization of building

- Landlord performs (common space) capital improvements causing 250 tCO2e with a useful life of 10 years*

Index year	0	1	2	3	4	5	6	7	8	9	10
Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Landlord											
Construction (Category 2)	**10,000**										
Years of use	50										
Amortization		200	200	200	200	200	200	200	200	200	200
Tenant improvement (Category 2)			**250**								
Years of use			10								
Amortization				25	25	25	25	25	25	25	25
Total Amortization		200	200	225	225	225	225	225	225	225	225
Tenant											
Lease period (years)	10										
Tenants % rentable sq. foot	25%										
Start year	2027										
End year	2036										
% RSF			25%	25%	25%	25%	25%	25%	25%	25%	25%
Leased asset (Category 8)			**50.00**	**75.00**	**75.00**	**75.00**	**75.00**	**75.00**	**75.00**	**75.00**	**75.00**

* For example, if a new HVAC repair is expected to have a 10-year lifespan of use, then the 250 tCO2e would be 25 tCO2e amortized.

Implications of operational v. financial control on capital improvements

- Operational control
  - Tenant improvements = operated by tenant (category 2)
  - Tenant would account for it in category 2
  - Landlord would account of it in category 13 (if not included in Landlord's category 2)

- Financial control
  - Tenant improvement = financial owned (capitalized by) landlord (category 2)
  - Tenant would account for it in category 8
  - Landlord would account for it in category 2

(Draft; for discussion)

Appendix C.
Some literature regarding capital goods in PCFs

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Pre-read

Literature (I)

- **(Frischknecht, et al., 2007)**: Frischknecht R, Althaus H-J, Bauer C, Doka G, Heck T, Jungbluth N, Kellenberger D, Nemecek T (2007): The Environmental Relevance of Capital Goods in Life Cycle Assessments of Products and Services. Int J LCA, **Sharepoint**
- **(Liang, et al., 2022)**: Liang, Y., Li, C., Liu, Z., Wang, X., Zeng, F., Yuan, X., & Pan, Y. (2022). *Decarbonization potentials of the embodied energy use and operational process in buildings: A review from the life-cycle perspective.* Renewable and Sustainable Energy Reviews, 165, 112558. **Sharepoint**
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* (Nugent and Sovacool, 2024): "This study has screened 153 lifecycle studies of greenhouse gas equivalent emissions for wind turbines and solar panels to identify a subset of the 41 most relevant, current, peer-reviewed, original, and complete assessments" (7. Conclusions, p. 12)

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Pre-read

Literature (II)

- **(Ye, et al., 2023):** Ye, Q., Krol, M.S., Shan, Y. *et al.* Allocating capital-associated CO_2 emissions along the full lifespan of capital investments helps diffuse emission responsibility. *Nat Commun* **14**, 2727 (2023). **Sharepoint**
- **(Hertwich, 2021):** Hertwich, E.G. Increased carbon footprint of materials production driven by rise in investments. *Nat. Geosci.* **14**, 151–155 (2021). **Sharepoint**

Appendix D.
Category 11 examples

Not all company-level reporting approaches show efficiency gain

Extending the durability of sold products can increase Category 11 (cumulative) emissions, and possibly also Category 1 (total cradle-to-gate) emissions, despite decreasing (improving) the effective GHG-intensity of an activity (or activities) of the use of said product(s) by a customer.

Some alternative methods of representing the GHG emissions of purchased/sold products for Corporate Carbon Footprint (CCF), i.e., GHG inventory reporting, were explored:

A. Cumulative Category 1, Cumulative Category 11 – current Standard approach
B. Cumulative Category 1, Annualized Category 11
C. Annualized Category 1, Annualized Category 11

Assumptions for a partial* lifecycle PCF

Proxy PCF Lifecycle (**Cumulative**)					
Sold product	Vacuum A	Vacuum B	Vacuum C	Vacuum D	Vacuum E
Category 1 (tCO2e) - cumulative	1.00	1.00	1.00	1.00	1.00
Lifetime (durability) (years)	*5 year*	*10 year*	*15 year*	*20 year*	*25 year*
tCO2e/year	0.25	0.25	0.25	0.25	0.25
Category 11 (tCO2e) - cumulative	1.25	2.50	3.75	5.00	6.25
Total (tCO2e) - Cumulative PCF *	**2.25**	**3.50**	**4.75**	**6.00**	**7.25**
% yoy	n/a	56%	36%	26%	21%

* This is a partial PCF as it only includes cradle-to-gate emissions, excludes scope 1 and 2, and excludes other scope 3 categories (e.g., T&D and EOL); the purpose of this example is to highlight the effect of Category 1 and Category 11 emissions accounting/reporting time boundaries for cumulative/annual figures

A. Cumulative Category 1, Cumulative Category 11 – current Standard approach

Corporate Carbon Footprint (CCF): **Cumulative** Category 1 emissions and **Cumulative** Category 11 emissions					
Year	1	2	3	4	5
Category 1 (tCO2e) - cumulative	1.00	1.00	1.00	1.00	1.00
Category 11 (tCO2e) - cumulative	1.25	2.50	3.75	5.00	6.25
Vacuum A	1.25	0.00	0.00	0.00	0.00
Vacuum B		2.50	0.00	0.00	0.00
Vacuum C			3.75	0.00	0.00
Vacuum D				5.00	0.00
Vacuum E					6.25
Total (tCO2e) - Cumulative CCF	**2.25**	**3.50**	**4.75**	**6.00**	**7.25**
% yoy	n/a	56%	36%	26%	21%

B. Cumulative Category 1, Annualized Category 11

Corporate Carbon Footprint (CCF): **Cumulative** Category 1 emissions and **Annualized** Category 11 emissions					
Year	1	2	3	4	5
Category 1 (tCO2e) - cumulative	1.00	1.00	1.00	1.00	1.00
Category 11 (tCO2e) - annualized	0.25	0.50	0.75	1.00	1.25
Vacuum A	0.25	0.25	0.25	0.25	0.25
Vacuum B		0.25	0.25	0.25	0.25
Vacuum C			0.25	0.25	0.25
Vacuum D				0.25	0.25
Vacuum E					0.25
Total (tCO2e) - Partially Annualized CCF	**1.25**	**1.50**	**1.75**	**2.00**	**2.25**
% yoy	n/a	20%	17%	14%	13%

C. Annualized Category 1, Annualized Category 11

Corporate Carbon Footprint (CCF): Annualized Category 1 emissions and Annualized Category 11 emissions					
Year	1	2	3	4	5
Category 1 (tCO2e) - annualized	0.20	0.30	0.37	0.42	0.46
Vacuum A	0.20	0.20	0.20	0.20	0.20
Vacuum B		0.10	0.10	0.10	0.10
Vacuum C			0.07	0.07	0.07
Vacuum D				0.05	0.05
Vacuum E					0.04
Category 11 (tCO2e) - annualized	0.25	0.50	0.75	1.00	1.25
Vacuum A	0.25	0.25	0.25	0.25	0.25
Vacuum B		0.25	0.25	0.25	0.25
Vacuum C			0.25	0.25	0.25
Vacuum D				0.25	0.25
Vacuum E					0.25
Total (tCO2e) - Annualized CCF	**0.45**	**0.80**	**1.12**	**1.42**	**1.71**
% yoy	n/a	78%	40%	27%	20%

Per year of use (functional unit of analysis) for products

- This reflects the annualized emissions per year of use of a vacuum cleaner (the functional unit of analysis)
- This results in annualized emissions of a vacuum to decrease year-over-year as the durability (lifespan) of said product increases while holding constant the annual emissions from use

Proxy PCF Lifecycle (**Annualized**)					
Sold product	Vacuum A	Vacuum B	Vacuum C	Vacuum D	Vacuum E
Category 1 (tCO2e) - annualized	0.20	0.10	0.07	0.05	0.04
Category 11 (tCO2e) - annualized	0.25	0.25	0.25	0.25	0.25
Total (tCO2e) - Annualized PCF	**0.45**	**0.35**	**0.32**	**0.30**	**0.29**
% yoy	n/a	-22%	-10%	-5%	-3%

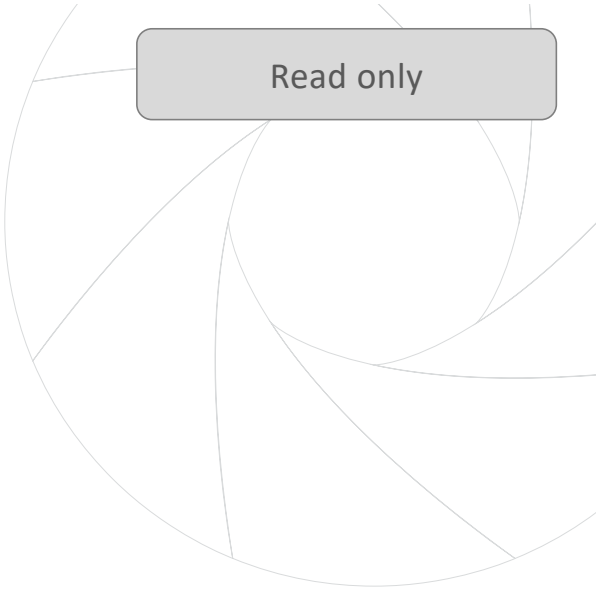
Comparison* of CCF and PCF figures on cumulative and annualized basis

Total (tCO2e) - Cumulative CCF	2.25	3.50	4.75	6.00	7.25
Total (tCO2e) - Partially Annualized CCF	1.25	1.50	1.75	2.00	2.25
Total (tCO2e) - Annualized CCF	0.45	0.80	1.12	1.42	1.71
Total (tCO2e) - Annualized CCF	n/a	78%	40%	27%	20%
Total (tCO2e) - Cumulative CCF	n/a	56%	36%	26%	21%
Total (tCO2e) - Partially Annualized CCF	n/a	20%	17%	14%	13%
Total (tCO2e) - Cumulative PCF *	2.25	3.50	4.75	6.00	7.25
Total (tCO2e) - Annualized PCF	0.45	0.35	0.32	0.30	0.29
Total (tCO2e) - Cumulative PCF *	n/a	56%	36%	26%	21%
Total (tCO2e) - Annualized PCF	n/a	-22%	-10%	-5%	-3%

* CCF figures and PCF figures are not quantitatively comparable; the purpose of this slide is to showing the year-over-year comparability within a CCF methodology and PCF methodology

Appendix E.
Other proposed boundary revisions (discussed in previous meetings)

Category 4/9
Classification rule(s)



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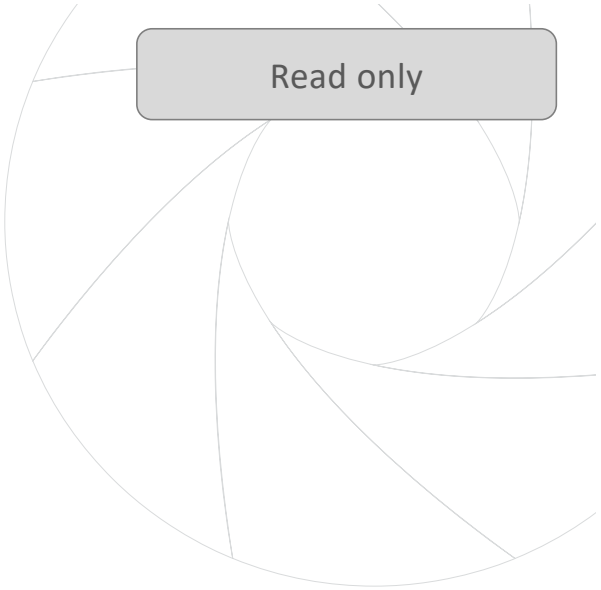
Refer to revision [D4.6] for options and Meeting 02 slides from Sept. 19

- Revisions/edits to Category 4 & 9 **classification rule(s)** will not be discussed in this meeting
- Members are welcome to provide input asynchronously and a survey vote will be distributed on this

- *For reference, the options considered included: **
  - ***Option 1: No change***
    - *Cat. 4) Purchased goods and services (Tier 1 to Gate) and Purchased T&D (upstream or downstream)*
    - *Cat. 9) Downstream T&D that is not purchased by company*
  - ***Option 2: Purchase principle***
    - *Cat. 4) "Purchased T&D services" ONLY*
    - *Cat. 9) "Unpaid T&D services" ONLY*
  - ***Option 3: Gate principle***
    - *Cat. 4) All upstream T&D activities are gate-defined based on or relative to the reporting company's sold product(s), including T&D activities purchased or not.*
    - *Cat. 9) All downstream T&D activities are gate-defined based on or relative to the reporting company's sold product(s), including T&D activities purchased or not.*

* Other options intentionally excluded; refer to Meeting 02 slides from September 19

Category 6 and 7



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Business travel includes accommodation for employees

- *Revision [D6.1]*
  - *The following was not change in the Description: Transportation of employees*

- Revision [D6.2]
  - The following was added to the Description: "Accommodation services (e.g., hotel nights) purchased by a reporting company for its employees (e.g., hotels, short-term rentals, etc.)."

- Revision [D6.4]
  - The following was added to the required boundary: "The upstream (cradle-to-gate) emissions attributable to accommodation (e.g., hotel nights, short-term rental, etc.)"

- **Proposed definition [D6.3]:**
  - "**Employee**: An individual directly employed by the reporting company (or by entities it owns, operates, or leases) under an employment contract and/or compensated (salary, wages, or benefits) by the reporting company."

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Employees excludes paid non-employees and external stakeholders

- "Employee" is narrowly defined (see previous slide)
  - Business travel (and accommodation) (Category 6) ***only*** applies to employees *
  - Employee commuting (and remote work) (Category 7) ***only*** applies to employees *

- Any and all business travel, accommodation, and/or commuting by paid non-employees or external stakeholders **shall** and **may**, respectively, be accounted for as a purchased good/service (Category 1)
  - Business travel by consultants paid directly, reimbursed, included in the contract
  - Accommodation of consultants paid directly, reimbursed, included in the contract
  - Transport of paid non-employees to and from facilitates owned and operated by the reporting company
  - Operation of remote worksites used by paid non-employees

- **Proposed definition [D1.3]:**
  - "**Paid non-employee**: An individual who performs work for the reporting company but who is not employed by it, and who is compensated either directly (as an independent contractor or consultant) or indirectly (through payment to a third-party vendor, agency, or service provider)."

* As per [D1.3], [D1.4], and [D1.5]: Business travel or commuting performed by paid, non-employees (e.g., consultants, vendors, etc.) in the service of a reporting company **shall** be accounted for in Category 1 as a purchased good or service.

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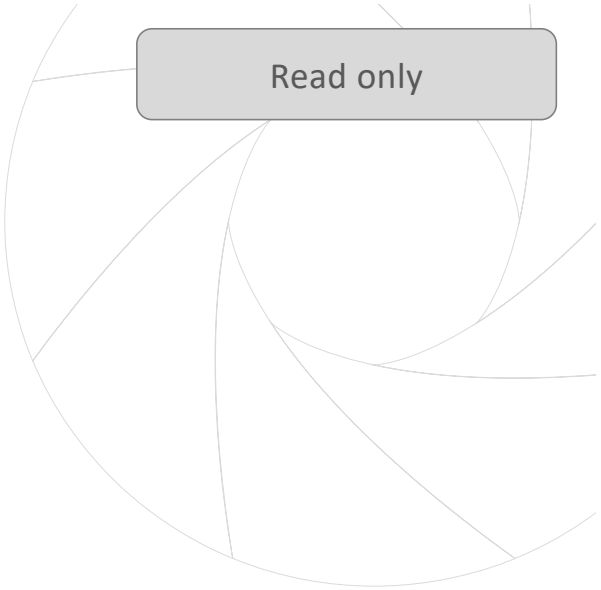
External stakeholder is defined but not itemized anywhere

- **Proposed definition [D1.6]:**
  - **External stakeholder**: "An individual engaged in activities connected to the reporting company's facilities, operations, or value chain who is not compensated by the reporting company, excluding customers. This includes employees of tenants, lessees, joint venture partners, upstream value chain partners that are not Tier 1, peer companies, industry associations, researchers, regulators, or community stakeholders."

- Consideration for review asynchronously or via a survey:
  - Consider specifying that companies may include business travel by, accommodation of, commuting by, and remote work of external stakeholders in Category 1
  - This optional boundary would be recommended ("should") if relevant (broadly defined)

Category 14



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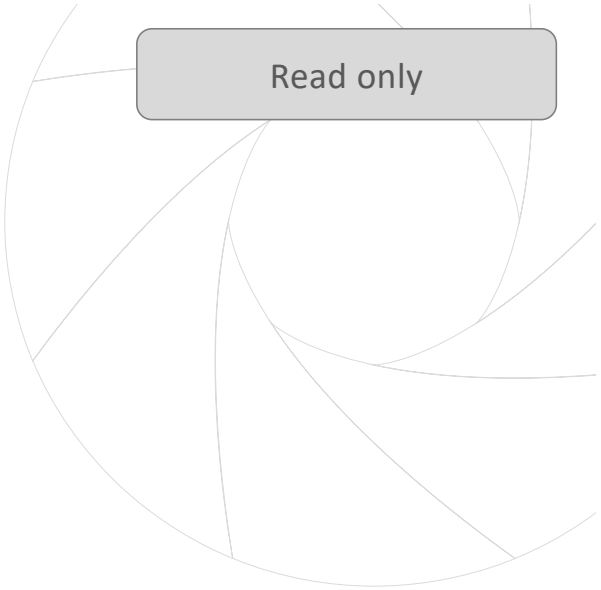
Quantification guidance for non-exclusive franchise models

- Proposed quantification guidance for non-exclusive franchise models:
  - "Franchisor engaged in non-exclusive franchise models **shall** account for **proportional** scope 1, scope 2, scope 3 emissions of the franchisor. Franchisee emissions **may** be allocated to each franchisor in proportion to the amount of income generated from or through the franchisee (economic allocation); alternatively, franchisors **may** use another allocation method (e.g., mass or volume of product sold) to allocate franchisee emissions between franchisors. For the avoidance of doubt, the proportional emissions accounted for by each franchisor **should** amount to total (100%) franchisee scope 1, scope 2, and scope 3 emissions."

Category 15



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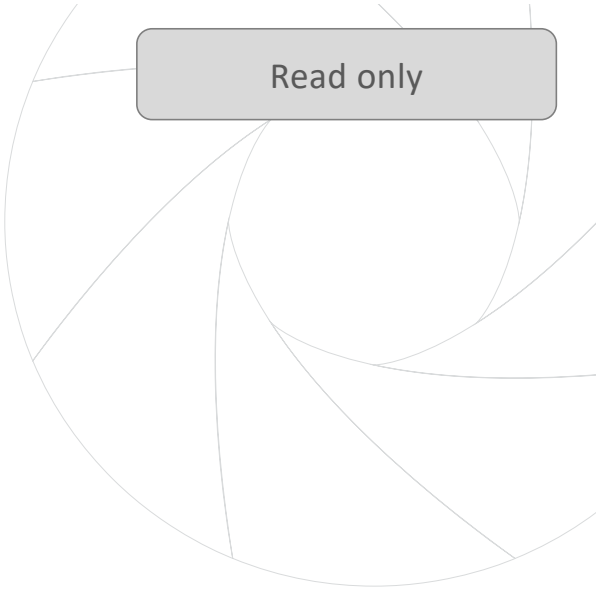
Commodities

- Refer to revisions [D15.5], [D15.6], [D15.7], [D15.8], [D15.9], and [D15.10]

- Note on the cradle-to-gate emissions boundary for commodities:
  - Revision [D5.10] is proposing that: "Companies shall account for the upstream (cradle-to-gate) emissions of all commodities purchased and sold in the reporting year and accounted for in Category 14, like is required for Category 1 (purchased goods and services)."
  - This is consistent with the boundary revisions applied to investees which requires the inclusion of investee scope 3 emissions by *investors*
    - The proposed boundary revision by the Scope 3 TWG now includes cradle-to-gate emissions in category 15 for all investments (equity, debt, etc.)
  - Therefore, using a cradle-to-gate emissions boundary for commodities is consistent with the required boundary for Category 15 as a whole

Category 16



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(16.4) Licensing and (16.5) Distributors of fuel and energy

- [D16.1] Licensing (excluding franchising) is itemized as a facilitated activity
- [D16.6] Companies **may** account for emissions from licensing activities
  - Differentiation of franchising vs. licensing:
    - Footnote: "For the avoidance of doubt, a franchise is a specific form of license agreement that includes (a) brand use, (b) system control, and (c) ongoing support and/or fees. A license, by contrast, grants permission to use intellectual property (e.g., a trademark, patent, or copyrighted material) without the level of business control typical of a franchise. Companies **shall** apply applicable accounting and regulatory requirements established by local standard setters to determine whether an agreement is that of a franchise or license. Where an agreement involves the elements of a franchise (i.e., brand use, system control, and ongoing support and/or fees), it **shall** be treated as a franchise agreement and the related emissions **shall** be accounted for in Category 14."
- [D16.1] Distribution of fuel/energy (not purchased by reporting company) itemized as a facilitated activity
- The full life cycle emissions of distributed [D16.4] Fuel and [D16.5] Energy **shall** be reported
  - Loss of fuels shall be accounted for as scope 1; Loss of energy shall be accounted for as category 3