Technical Document Open consultation WBCSD Guidance on Avoided Emissions

Contents

I. Introduction

Context of the *Guidance* on *Avoided Emissions* development

At the United Nations Climate Change Conference (COP27) in 2022, the World Business Council for Sustainable Development (WBCSD) announced that it would launch the *Guidance on Avoided Emissions* in time for the 2023 G7 Climate, Energy and Environment Ministers meeting. It made the announcement at the Government of Japan COP27 Pavilion in collaboration with the Japanese Ministry of Economy, Trade and Industry (METI). In March 2023, WBCSD published its first cross-sector *Guidance on Avoided Emissions*. Over 60 multinational companies and expert organizations contributed to the development of the Guidance. WBCSD presented the Guidance at the Sapporo G7 Climate, Energy and Environment Ministers Meeting in April 2023 and the G7 ministers officially welcomed and referenced the work in their final communiqué.

Business, finance and policy actors positively received the Guidance and the relationship with key stakeholders has since deepened and broadened. This has also led to the expansion of the WBCSD Avoided Emissions work portfolio, with the aim to contribute to more standardized approaches for avoided emissions accounting. WBCSD is continuously engaging with companies across key sectors, such as the built environment, agriculture and food, chemicals, energy, transport and mobility, and digital, to test and further enhance the Guidance as the intervention-based emissions accounting landscape is still nascent and emerging methodologies are still in their early adoption phases.

As a next step, we aim to refine the Guidance and move towards a document with high technical quality that supports the further standardization of avoided emissions methodologies and prepares for (partial) integration in standard-setting processes in the context of corporate climate action and market-based mechanisms. A thorough review of >10 existing and emerging intervention-based frameworks, combined with the testing results collected over the past 24 months, have led to this open consultation to receive public feedback on key elements of the Guidance, as well as on some refinements identified since its launch.

Purpose of this consultation

With this consultation, we welcome multi-stakeholder feedback on the WBCSD *Guidance on Avoided Emissions*, encompassing both elements of the 2023 Guidance document and the more recently developed refinement proposals based on the document review and testing results. Over 2 months, we invite stakeholders to review the themes and refinement proposals in this document and share their feedback with us. Ultimately, the aim is to develop a robust and practical Guidance that considers the perspectives of a broad set of stakeholders on core themes and refinement proposals. We will consolidate and summarize the open consultation responses to guide the finalization of the updated Guidance document. While we will review all feedback, we cannot incorporate every response into the revised Guidance. Note that WBCSD will not provide specific responses to your feedback.

How to read this technical consultation document

In this technical consultation document, you will find a comprehensive description of the key refinements proposed for the Guidance. This document serves as technical supplementary material to help stakeholders formulate responses to the online consultation survey. The survey outlines a high-level rationale and description for each theme based on original sections of the Guidance or on recently developed refinement themes.

How to submit your feedback

You can submit your feedback through the online survey until **18 January 2025**. Respondents may provide detailed feedback, including specific alternative proposals where they disagree with the content, expressions of support where they agree and suggestions for improvement. Note that it is possible to answer only selected sections – it is not necessary to provide an answer to all questions. WBCSD will also consider any partially completed surveys submitted.

II. Summary of refinements

Overview of key refinement proposals

In total, we selected 10 key refinements for feedback during this consultation. See the table below for a summary of these refinements. Some refinements are already addressed in the Guidance, but are identified for finetuning, whilst other refinements are marginally addressed and are now proposed for an additional comprehensive deep dive. We have more extensively described them in the remainder of this document. Next to these key refinements, WBCSD is also working on other adjustments to the Guidance as part of the refinement process.

Table 1: Themes and where the guidance addresses them

Refinement theme	Type of refinement	Where the Guidance addresses the theme	Page in this document
1. Relationship between corporate climate action & accounting and avoided emissions and greenhouse gas (GHG) inventory AE and GHG inventory Definitions of relevant concepts in corporate climate action and accounting and their relationships with avoided emissions, e.g., Scope 3.11, carbon removals, offsetting	Finetuning (existing)	Chapter 2: Understanding avoided emissions	6
2. Types of avoided emissions (AE) solutions & system expansion in AE claims Definition of and relation between intermediary and end-use solutions and the methodological implications; generic guidance and principles for system expansion	Finetuning (existing)	Section 4.3, Gate 3: contribution legitimacy	8
3. Gate 1: Climate action credibility (organization) Principles for adherence to climate action credibility at the organizational level to address different categories of actors and frameworks for climate action	Finetuning (existing)	Section 4.1, Gate 1: Climate action credibility	12
4. Gate 2: Latest climate science alignment (solution) Proofing alignment of solutions with climate science and delineating climate solutions from high-emissions assets and technologies	Finetuning (existing)	Section 4.2, Gate 2: Latest climate science alignment	14
5. Gate 3: Contribution legitimacy Structure and definitions to qualify a solution as a significant and direct contributor to avoided emissions impact	Finetuning (existing)	Section 4.3, Gate 3: Contribution legitimacy	17
6. Reference scenario & timeframe Clarification of the distinction between year-on-year (YoY) and forward-looking approaches to AE	Finetuning (existing)	Chapter 5: Assessing avoided emissions	20

assessments; approach to and implications of recalculation of reference and solution scenarios			
7. Allocation Exploring necessity, potential use cases and approaches for allocation of AE impact to various contributing actors	Deep dive (mainly additional)	Section 5.5.4: Double counting and avoided emissions	24
8. Data Good practice for data quality and data collection, as well as hierarchy of data sources for reference and solution scenario modelling and reporting	Deep dive (mainly additional)	Section 5.5.5: Recommended data sources for the calculation of avoided emissions	26
9. Traceability and impact monitoring Addressing the relevance of traceability in AE calculations and practical discussion of the validation of AE impact in business-to-business (B2B) or business-to-consumer (B2C) contexts.	Deep dive (mainly additional)	Not specifically addressed	29
10. Aggregation, consolidation and reporting Approaches to consolidation of AE impact across a company portfolio; further guidance on consolidation and reporting in line with existing frameworks	Finetuning (existing)	Section 5.7, Step 5: Assess avoided emissions at the scale of the company (optional); Section 6.1: Guidelines for reporting avoided emissions	31

III. Refinement proposals

Introduction

This section provides the ten key themes of the open consultation and the associated questions you can respond to through the online survey. Each refinement includes a high-level rationale behind the proposal and an outline of the respective Guidance content and proposed refinements. Underneath each section, you will find the questions for feedback that are part of the online survey.

1. Relationship between AE and GHG inventory

Rationale for refinement

To further support the application of the guidance in practice and clarify the role and complementarity of intervention-based/avoided emissions assessments with existing GHG inventory accounting, we propose further explanation of the relationship between key concepts in corporate climate action.

Addressed in Guidance: Chapter 2: Understanding avoided emissions

Proposed refinement

In general, AE assessments and GHG inventory have different calculations. Unlike a company's carbon inventories, which it builds by taking stock of historic emissions relative to a base year, avoided emissions are often forward-looking and their calculation uses a comparative assessment of a low-carbon scenario relative to a hypothetical counterfactual reference scenario.

During climate solution production and implementation, the emissions of a solution provider usually increase, while those of the solution user can decrease (see examples below). The solution provider is not alone in capturing emissions reductions as such through an inventory perspective. Given that the uptake of and demand for climate solutions may increase in the near future, this may also lead to an increase in a climate solution provider's scope 1, 2 and 3 emissions.

There are also cases where there may be a potential overlap between the scope 3 emissions of a solution provider (associated with the direct use phase of the products sold) and the inventory emissions of a solution user, for instance when an appliance or equipment manufacturer increases the use phase energy efficiency of one of its long-running products. This often applies to efficiency increases for solutions that consume energy during use, fuels and feedstocks and products that contain or emit GHGs during use (see the GHG Protocol Scope 3 standard for more information).

These are non-exhaustive examples of avoided emissions solutions to illustrate different ways in which the solution provider and user inventory emissions evolve depending on the use case. Note that the below cases and graphs are highly schematic and depend on a variety of conditions, such as whether it is a brownfield or greenfield project for the solution provider. Generally, avoided emissions solutions lead to an increase in inventory emissions for the solution provider and a reduction in inventory emissions for the solution user.

Example 1: LED light bulbs

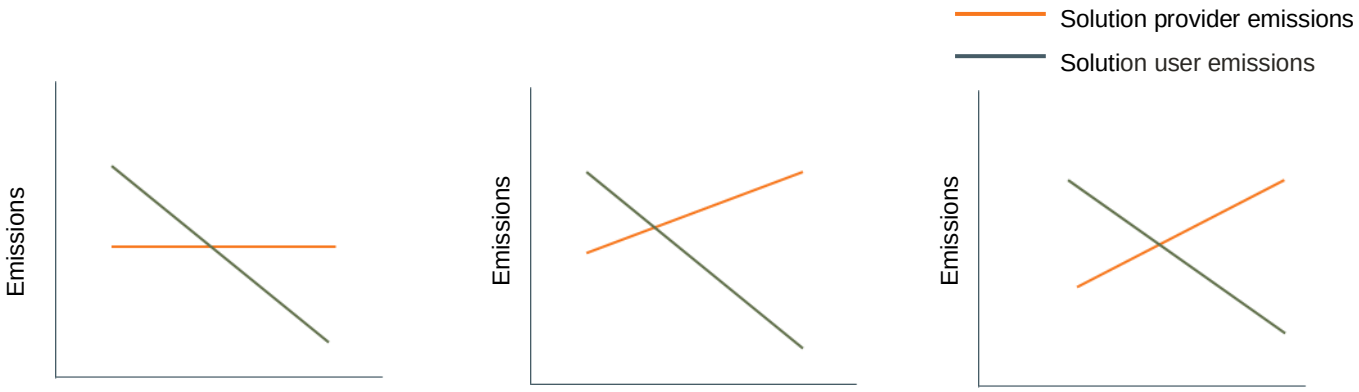
A solution provider switches from standard incandescent bulbs to LED light bulbs. Both solutions have similar GHG emissions in their manufacturing, so the inventory remains largely the same. For the user, however, the LED light bulbs enable a scope 2 emissions reduction due to lower electricity requirements.

Example 2: High-performance glazing

A solution provider of high-performance glazing with higher manufacturing carbon content compared to standard glazing sees an increase in scope 1, 2 and potentially scope 3 emissions, such as purchased goods and services. The building user has lower scope 1 and 2 GHG emissions given the energy-efficiency gains from the glazing solution.

Example 3: Livestock feed

A solution provider manufactures cattle feed supplements that reduce enteric emissions or methane emissions due to the fermentation in these ruminants. To manufacture the solution, the provider faces higher scope 1 and 2 emissions and potentially scope 3 emissions, like purchased goods and services, while farmers that use the solution will note a reduction in their scope 1 emissions.



Ex. 1 Led-light bulbs Ex. 2 High-performance glazing Ex. 3 Livestock feed

Solution providers can complement their GHG accounting with a reference to their AE assessments in line with this Guidance to highlight the mitigation potential of the products and services sold. In this way, they can receive recognition for their contributions to decarbonization outside of their own operations. It is important to emphasize that there should be no compensation or “netting” between the inventory emissions and avoided emissions of a solution provider who claims avoided emissions.

Questions for consultation

- Do you agree that the complementary roles of avoided emissions and GHG inventories of AE solution providers and users require further guidance?
- To what extent do the examples and schematic graphs support your understanding of the relationship between GHG inventory and AE?
- How should the Guidance treat cases in which emissions reductions occur in both the solution provider’s inventories (e.g., scope 3 use-phase emissions) and solution users’ inventories (e.g., scopes 1 and 2)?

2. *Types of avoided emissions solutions & system expansion in AE claims*

Types of avoided emissions solutions

Rationale for refinement

The Guidance includes examples of three archetypes that can qualify as avoided emissions solutions. This refinement aims to provide definitions of avoided emissions solutions that also encompass services and projects. That should make it easier for companies to identify types of solutions and apply the Guidance. The type of solution links to a notion of the system expansion proposed for refinement during this consultation.

Addressed in Guidance: Section 4.3, Gate 3: Contribution legitimacy

Proposed refinement

The Guidance defines two solution types in the context of AE based on existing definitions adapted from the GHG Protocol.

1. Intermediary solutions are inputs in the production of other goods or services that require further processing, transformation or inclusion in another solution before use by the end-consumer. It considers goods or services that enable other solutions as intermediary. The end-user does not consume intermediary solutions in their current form. Examples:
   - *Battery for electric vehicles (EVs)*
   - *Blades for wind turbines,*
   - *EV charger (enabler)*
   - *Geo-location software to optimize solar installations (service)*
   - *Project that consists of a portfolio/set of solutions, like updating industrial machinery for efficiency/automation (where the machinery is a part of a project).*

2. End-use solutions are goods and services consumed by the end-user in their current form, without further processing, transformation or inclusion in another solution. Examples:
   - *Electric vehicle*
   - *Heat pump*
   - *Solar panel*
   - *Animal feed ingredient to reduce enteric emissions*
   - *Low-carbon lighting leasing service*
   - *Grid optimization software for EV charging*
   - *Project that consists of a portfolio/set of solutions, like retrofitting a building to increase energy efficiency (efficient lighting, appliances, insulation, new windows), updating industrial machinery for efficiency/automation (where the machinery is the end-use project).*

In the next theme, we introduce the concept of system expansion, showing that the analysis can consider things such as an intermediary solution as an end-use solution depending on the system level at which the analysis takes place. Note that the Guidance will include enabling solutions and service solutions in examples.

Questions for consultation

- Do you agree with the proposed definitions? If you don't, what do you propose instead? [Please also consider the refinements proposed on system expansion and principles.]
- In your view, do these definitions cover all/most of the relevant avoided emissions solutions? Are there any solutions that create avoided emissions that would not fall in the categories above? Please explain.

System expansion in avoided emissions claims

Rationale for refinement

The Guidance specifies that the calculation of avoided emissions is the difference between the GHG emissions of a solution and a reference scenario with a focus on “end-use" solutions. This refinement introduces the notion of *system expansion* that indicates at which (system) level a solution can potentially claim avoided emissions and qualify either as an intermediary or end-use solution. The aim is to make it easier to apply the Guidance by providing additional clarity about the level at which a solution can claim AE (specific product or wider system) and in which cases it is best to avoid systems expansion and when it can be useful.

Addressed in Guidance: Not specifically addressed.

Proposed refinement

System expansion may help, especially for intermediary solutions that contribute directly to avoided emissions impact but are part of a wider system or end-use solution. Generally, the system boundaries for an AE claim should be as concise as possible so that the contribution of the solution provider is easier to convey and measure. System expansion pertains to intermediary or end-use solutions depending on the system level. This means that: i) not all solutions that are part of a wider system or end-use solution would be eligible to claim AE only because they are part of the system or end-use solution; ii) solutions could still claim AE at another (narrower) level when they enable a direct mitigation effect compared to a similar product or reference. This guidance will illustrate this with an example of a new EV battery (see Figure 1) in section 4.3, Gate 3: Contribution legitimacy.

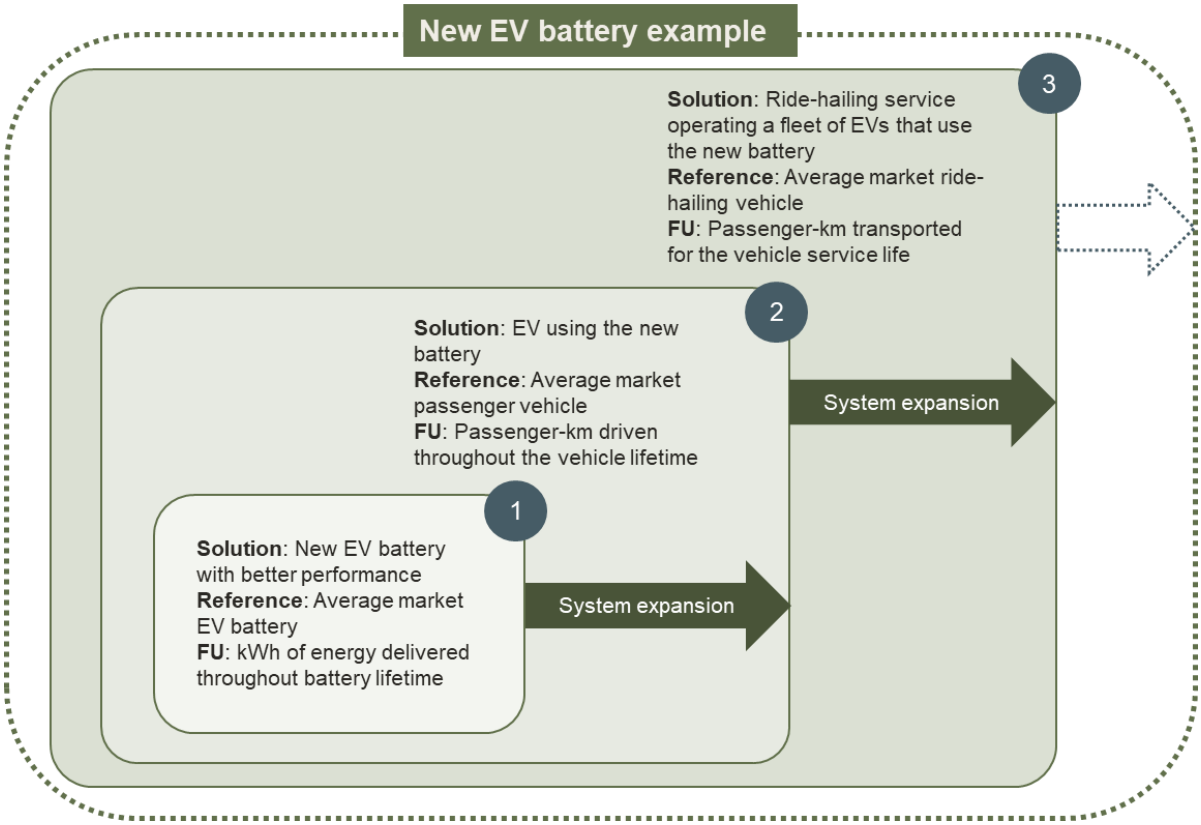


Figure 1: New EV battery example

- At level 1, the *new battery is the end-use solution* and is comparable to another battery as a reference. The difference in kWh of energy provided over the lifetimes of the two batteries,

stemming from higher performance due to situations like less charging losses, can result in an avoided emissions claim at the product end-use level.
- At levels 2 and 3, the *new battery is the intermediary solution* as part of a vehicle or ride-hailing service.
- At level 2, the *EV is the end-use solution* and is comparable to a reference average market passenger vehicle. The difference in passenger-km driven can result in an avoided emissions claim by the EV as the end-use solution.
- At level 3, the *ride-hailing service is the end-use solution, while the EV is the intermediary solution*. The ride-hailing service that uses a fleet with the new battery is comparable to the reference average ride-hailing service. The difference in passenger-km serviced can result in an avoided emissions claim by the ride-hailing service using the new battery as an end-use solution.

In summary, the end-user, and subsequently the function and functional unit (FU) of the solution, changes depending on the system level of the assessment. The reference scenario changes according to the system level. Consequently, avoided emissions can be claimed depending on the type of solution, i.e. intermediary or end-use, in a specific system.

Key principles of system expansion

In the context of AE, a system expansion must consider three principles:

1. Before each system expansion, the user must assess whether the solution has a direct and significant decarbonizing impact (meaning Gate 3 check) in each system where emissions occur and the company seeks to claim AE. The intermediary solution must meet Gate 3 criteria by demonstrating a direct and significant decarbonizing impact, evident at the broader system level of an end-use solution that has already passed Gate 3.

   Section 0, Gate 3 Contribution legitimacy provides practical examples of the application of this principle.

2. If the user cannot define the reference/functional unit of the wider system, then it should not expand the system.
   - *Example: Breakthrough innovations, such as nano-robots. In this case, the system is not expandable as nano-robots currently have no clearly defined function, so it is not possible to compare them to a sufficiently specific reference*.

3. For intermediary solutions, it is possible to expand the system only if tracing/verification of the intermediary solution contributes to an end-use solution's avoided emissions.
   - *Example: Critical machinery to produce an intermediary solution used in numerous end-use solutions but only a few of them contribute to AE. In this case, the user should not expand the system because it cannot trace the exact end-use solution.*

Relevant considerations

Expanding the system boundaries in AE assessments affects various parameters in different ways. As the system scope broadens from a product to a wider system, mostly due to an increase in the number of components and actors involved:

- The likelihood of double counting increases;
- The significance of individual contributions diminishes;
- The traceability of impacts becomes more challenging;
- The reliance on assumptions increases;
- The access to data deteriorates and levels of control decrease.

Questions for consultation

- Do you agree with the proposed refinement of the concept of system expansion? If not, in which areas of the proposal do you see critical challenges?
- What would you change or add to the system expansion principles?
- What elements in the current list of system expansion principles do you think are the most important?
- Do you have any further comments?

3. Gate 1: Climate action credibility

Rationale for refinement

Climate action credibility covers whether a company conducting an AE assessment has set and communicated a climate strategy, GHG footprint and targets and regularly reports on progress. This refinement expands the approach to allow companies to adhere to core principles of climate action without strict reliance on specific frameworks. Plus, it provides additional clarity for situations where compliance with established frameworks is not possible but an assessment can still consider avoided emissions solutions. The goal is to increase inclusivity while safeguarding the integrity and transparency of AE claims.

Addressed in Guidance: Section 4.1, Gate 1: Climate action credibility.

Proposed refinement

To demonstrate climate action credibility, a company should have a climate strategy with aligned emissions reduction targets, or in the process of alignment, with climate science and proven through existing frameworks. At a minimum, an eligible company must:

- Provide a recent,[1] third-party verified GHG emissions inventory for scope 1, 2 and 3 emissions that it publicly discloses and regularly updates.
- Publicly set a net-zero target and transition plan aligned with a 1.5°C pathway[2] – prioritizing (i) international scenarios and (ii) regional or national scenarios – and including both short- and long-term goals.
- Regularly monitor and publicly report progress on the established targets using emissions-based key performance indicators (KPIs).

Framework selection

The frameworks applied should be internationally recognized and include a third-party review of climate targets to ensure credibility.

While the Guidance mandates no specific framework, the selected framework, guidance, standard or tool must, at a minimum, be science-based, globally applicable, and, preferably, include sector-specific requirements. The selected framework should:

a) Have a design aimed at helping organizations and regions achieve net-zero emissions by 2050 in alignment with a 1.5°C pathway;
b) Require clear, measurable target-setting with interim milestones, continuous tracking of progress, an emphasis on transparency and requirements or provisions for third-party verification to ensure compliance.

For any frameworks that meet these requirements and do not include a mandatory third-party review, the company must provide one.

We provide a non-exhaustive list (that we may supplement) of cross-sector initiatives and guidelines aligned with the latest climate science below.

- Science Based Targets initiative (SBTi) Corporate Net-Zero Standard
- United Nations Climate Change (UNFCCC) Race to Zero and other Race to Zero accredited organizations
- Exponential Roadmap Initiative 1.5ºC Business Playbook
- International Energy Agency (IEA) Net Zero 2050 scenarios (as long as company has also established interim targets)
- Net Zero Initiative
- Transform to Net Zero Net Zero by 2050
- International Organization for Standardization (ISO) Net Zero Guidelines
- National or regional decarbonization pathways compatible with 1.5°C

Note: For small and medium-sized enterprises (SMEs), an SME Climate Hub Commitment/SBTi requirements for SMEs will be sufficient to meet this criterion.

Cases of non-compliance

Some companies may not comply with the referenced frameworks, including micro, small and medium-sized enterprises (MSMEs), pure players or those operating in high-emissions, hard-to-abate sectors with significant emissions-intensive assets that existing standards do not cover. In line with global efforts[3] to recognize climate action and support accountability across various actors, it is imperative to acknowledge climate action, transparency and continuous improvement efforts.

Therefore, in such cases, the assessment of the company's climate action credibility should take place on a case-by-case basis and the company must:

- Clearly explain why compliance with the specified frameworks is not possible;
- Provide evidence of target alignment with 1.5°C using alternative frameworks than those mentioned in the box, that are science-based and meet the criteria mentioned under Framework selection;
- Ensure third-party verification of this alignment, demonstrating that compliance with the alternative framework is clear, verifiable and conforms to the standards outlined in this guidance.

Questions for consultation

- Do you agree with the requirements for demonstrating climate action credibility?
- Are any important frameworks missing from the list in the box?
- Is the guidance provided for the cases of non-compliance sufficient? Do you foresee any associated risks? Please explain your reasoning.

4. Gate 2: Latest climate science alignment

Rationale for refinement

Solutions are eligible if they align with the latest climate science. This refinement aims to provide clearer guidance to evaluate the mitigation potential of solutions that may not fully align with established global taxonomies, such as the Intergovernmental Panel on Climate Change (IPCC) or EU Taxonomy. It specifies and nuances the relationship between climate solutions and high-emitting/fossil fuel assets and technologies.

Addressed in Guidance: Section 4.2, Gate 2: Latest climate science alignment

Proposed refinement

Eligibility criteria for cases that do not comply with the 6th IPCC Assessment Report (AR6) or the EU Taxonomy

i. Not related to fossil fuels

Innovations: Avoided emissions can provide key insights to accelerate and incentivize innovation. However, radically new innovations such as emerging technologies at an early stage of development (Technology Readiness Level <6), solutions applied to low-emitting sectors, and circular innovations cannot yet demonstrate substantial contributions to climate change mitigation, as described in the technical screening criteria of the EU Taxonomy or the sectoral and system mitigation options of the IPCC AR6.

In this case, to prove Gate 2 eligibility, the reporting company must be able to demonstrate, on a solution level:

- **Justified non-compliance** – Thoroughly explain the reasons for the lack of compliance with the IPCC AR6, EU Taxonomy or other established taxonomies.
- **GHG emissions reduction** potential – Provide one of the following options, where applicable.
  1. Evidence that the solution has GHG emissions reduction potential based on the disclosure of credible and internationally recognized[4] sources;
  2. Evidence that the solution has GHG emissions reduction potential based on a scientific research study, no more than 3 years old, that explicitly assesses the mitigation potential of innovations with the same or similar function.

ii. Related to fossil fuels

(a) Addressed by the Guidance and potentially eligible as avoided emissions: efficiency derivatives (if end-use is eligible)

Fossil-derived products such as lubricants, synthetic fibers, fertilizers and coke-derived graphene can be relevant drivers of decarbonization and necessary inputs for eligible avoided emissions end-use solutions (for example, lubricants for EVs, synthetic fibers replacing steel mesh in construction). While the end-use solution may have decarbonizing potential, reliance on fossil fuel derivatives may create a carbon lock-in, hindering the exploration of cleaner alternatives and conflicting with the transformative nature of AE solutions and their alignment with a 1.5°C pathway. The Guidance does not exclude these types of solutions per se but they require closer examination than non-fossil based solutions. Companies should substantiate related claims with (i) evidence that no scalable low-emission alternatives with comparable impact on the emissions reductions of the end-use solution are available in the same market; (ii) increased impact monitoring and traceability requirements (such as to ensure that combustion engines do not

include lubricants); and (iii) a transition plan that describes efforts to avoid a lock-in of fossil fuel activities that relate to the production of the derivatives.

(b) Not addressed by the Guidance and generally not eligible as avoided emissions

Certain solutions, while critical to global decarbonization and the transition away from fossil fuels, are not addressed in the Guidance because they relate to high-emitting technologies that are often phased down. These solutions are based on a risk-driven, downscaling approach aimed at emissions reduction, and therefore require a different approach compared to climate solutions (extended mitigation efforts). Given their role in the global transition, the development of a dedicated approach for phase-down activities is encouraged.

In contrast, AE aim to incentivize and support climate solutions that go beyond emissions reduction, focusing on scale-up, opportunity-driven innovations designed to drive systemic change and support a net-zero future.

Examples of solutions not addressed in the Guidance include:

- Accommodating energy security needs or no technologically or economically feasible low-carbon alternatives are available in the specific context (due to lack of wind/sun/feedstock for renewable energy, for instance).
- Any activities related to managed or accelerated phaseout or retirement of high-emitting assets (such as the retirement of a coal power plant).
- Transitional activities or improvements not considered viable for a net-zero economy (like gas energy in some regions, methane leakage solutions).

Table 2. Overview of different categories and solution types and their Gate 2 eligibility

Category	**Solution type**	**Gate 2 eligibility**
Not related to fossil fuels	Innovations	Potentially eligible
Related to fossil fuels	End-use solution that employs fossil fuel-based derivatives	Potentially eligible
	Directly applied to activities involving exploration, extraction, mining or production, distribution and sales of fossil fuels, i.e., oil, natural gas and coal	Not eligible
	Transitional improvements (e.g., direct emissions reduction efforts)	Not eligible
	Accommodating energy security needs or no technologically or economically feasible low-carbon alternatives available in the specific context	Not addressed in the Guidance
	Any activities related to the managed phaseout and retirement of high-emitting assets	Not addressed in the Guidance
	Transitional activities not viable for a net-zero economy	Not addressed in the Guidance

Questions for consultation

- Are the requirements to prove Gate 2 eligibility feasible and realistic?
- Do the additional nuances related to fossil fuel applications provide more clarity on eligibility criteria and is anything missing? Please explain.

5. Gate 3: Contribution legitimacy

We recommend reading the proposed System expansion in avoided emissions claims Refinement (theme 2) before responding to this section.

Rationale for refinement

The goal of this refinement is to enhance the integrity of avoided emissions claims by guiding companies in determining whether their solutions have a direct and significant decarbonizing impact. We introduce prescriptive and practical definitions for decarbonizing and direct and significant impact. These consider the different solution types (intermediary and end-use) and system-level AE claims, which align with the proposed refinement of system expansion.

Addressed in Guidance: Section 4.3, Gate 3: Contribution legitimacy

Proposed refinement

To assess a solution's contribution legitimacy, the company should follow the Gate 3 eligibility rule.

Gate 3 eligibility rule: The solution must have a decarbonizing impact that is both (i) direct and (ii) significant at every system level where AE emissions occur and claims made.

Table 3. New definitions for decarbonizing, direct and significant impact

Type of impact	Definition
Decarbonizing	The solution leads to actual GHG emissions reductions compared to a reference scenario or less emissions than would happen without the solution and these are quantifiable. The solution's application reduces reliance on carbon-intensive actions, processes or technologies.
Direct	The solution leads to emissions reductions through its own inherent functionality. This means the avoided emissions occur due to a cause-effect relationship between the solution and the emissions reduction that it is possible to evidence and trace.
Significant	The solution: i. Achieves substantial emissions reductions compared to the reference scenario (end-use). "Substantial" can refer to the scale of impact in absolute numbers at a specified system level or a reduction sufficient to compensate for potential variations due to uncertainty related to data and assumptions that underly the AE claim. **or** ii. Serves as an essential or key component of an eligible end-use solution and it is not possible to replace it without compromising substantial emissions reductions.

As included in the proposed "Key principles of system expansion" refinement, the user may need to do repeated Gate 3 checks on system boundary expansion. Before each system expansion, the user must assess the intermediary solution's contribution legitimacy in each system where emissions occur and where it seeks to claim AE. The intermediary solution shall meet Gate 3 criteria by demonstrating a direct and significant decarbonizing impact at the broader system level of an end-use solution that has already passed Gate 3.

Example 1: Company A manufactures EV chargers that can supply 100% renewable electricity

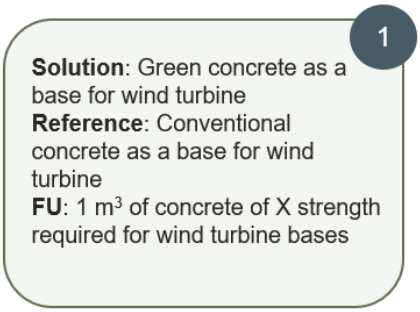
Claim	AE from EVs running on 100% renewable electricity compared to EVs running on the average grid mix [level 1] (same charger type) claim by company manufacturing EV chargers
Decarbonizing impact	**Yes**, it enables the powering of the EV with renewable electricity, eliminating reliance on fossil fuels and cutting GHG emissions by xx% compared to using the grid mix.
Direct impact	**No**, the AE of the EVs in this case result from using renewable energy, which is not related to the EV charger's functionality or specifications. The manufacturer is not promoting the use of renewable energy with its charger but rather leveraging the differing grid conditions.
Significant impact	**Yes**, the EV charger is an essential component of the EV system that enables its operation and power supply.
Gate 3 eligibility	**No**, the solution has a decarbonizing impact that is significant but not direct. Therefore, it is not eligible to pass Gate 3.

In this example, the manufacturer of the EV charger cannot claim AE from the use of renewable energy for EV operation when compared to the same type of charger in different grid conditions, as this difference is due to external factors.

However, when claiming AE from replacing internal combustion engine (ICE) vehicles with EVs running on 100% renewable electricity in country X's fleet, the EV charger leads to actual GHG emissions (decarbonizing impact) through its charging function (direct impact) and is a key component that the company cannot replace without compromising substantial emissions reductions for EVs (significant impact), thus allowing for valid AE claims.

Example 2: Company manufacturing low-emissions "green" concrete for use as a base for wind turbines

Level 1: The claim uses a product-to-product comparison (meaning green vs conventional concrete) in the context of a specific application (base for a wind turbine). Note that this comparison can apply to any application, for instance the concrete used in a residential building, with the wind turbine serving as just one example.

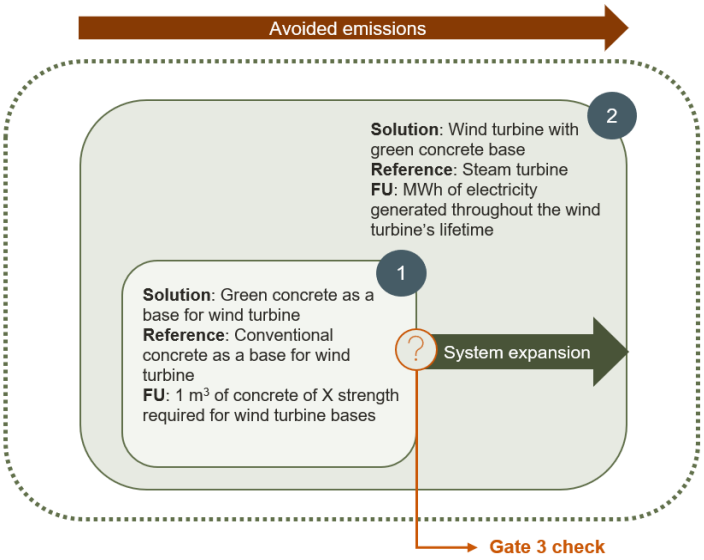


Claim	AE from green compared to conventional concrete when used as a base for wind turbine claim by company manufacturing the green concrete.
Decarbonizing impact	**Yes**, green concrete has lower cement content, fewer virgin material inputs and a less energy-intensive production process compared to conventional concrete, leading to reduced emissions by xx% during its production.
Direct impact	**Yes**, using lower-emissions green concrete reduces the production emissions of the turbine base
Significant impact	**Yes,** green concrete leads to substantial emissions reductions compared to the average market solution of conventional concrete when quantified in the wind turbine application.
Gate 3 eligibility	**Yes**, green concrete achieves substantial emissions reductions compared to conventional concrete in wind turbine application.

At level 1, green concrete is the end-use solution and the company can claim avoided emissions. At level 2, the green concrete is an intermediary solution for the wind turbine end-use solution.

The company must carry out a Gate 3 check before system expansion.[5]

- In this case, green concrete cannot claim wind energy AE, as there is no direct impact. The green concrete base ensures structural integrity but does not contribute to emissions reductions from wind electricity versus steam.



Questions for consultation

- Do you agree with the proposed definitions for decarbonizing, direct and significant impact? In what ways it is possible to simplify the definitions (e.g., combining decarbonizing and significant impact)?
- Are any key aspects missing from these definitions? If yes, please share the aspect and a concrete description of what it should contain.
- Do the new definitions disqualify any solutions from consideration although they need to be? Please share concrete examples.
- Are the Gate 3 requirements well-suited for the claim eligibility assessment or would it be better to embed them in the impact assessment steps? Please explain your rationale.

6. Reference scenario & timeframe

Rationale for refinement

The Guidance provides information on the identification of the timeframe of an AE assessment: forward-looking (FW) or Year-on-Year (YoY). It outlines the definition of a reference scenario, such as based on new demand or existing demand, including the example case of existing solution replacement. This refinement aims to provide further guidance and numerical examples for the FW and YoY approaches grounded in life-cycle assessment (LCA) thinking. It also aims to ease the practical application of the Guidance by including a more concrete definition of the reference scenario with examples.

Addressed in Guidance: Throughout section 5, and more specifically in sections 5.3., Step 1: Identify the timeframe of the avoided emissions assessment, 5.4, Step 2: Define the reference scenario and 5.5, Step 3: Assess the life cycle emissions of the solution and the reference scenario

Proposed refinement

Forward-looking and year-on-year approaches

Defining the reference solution

The reference solution should represent state-of-the-art, widely used (based on their market share) solutions that fulfil the same function as the solution for the AE assessment. The reference should be representative of a specific industry or region and the system assessed, as well as its boundaries.

For solutions with a lifespan of more than one year, the following applies where there is a replacement. In the existing demand situation, when a solution replaces reference technologies before they reach their end-of-life (EoL), the reference should include both the new sales and the existing stock of technologies, meaning not just the new sales.

Once defined, the reference solution should remain fixed based on the year of sale or the initial lease. This will apply throughout the contract period or the usable life of the solution, including any necessary operational start-up time.

The company shall use the fixed reference solution in:

(i) *The **timeframe identification** of the AE assessment*, for both the forward-looking and YoY approaches.
(ii) The ***reference scenario definition***, for the new demand situation or existing demand situation replacing technologies at their end-of-life.

This ensures consistency for the reference scenario between FW and YoY approaches (see simplified example 1 below), by preventing more favorable comparisons that could arise from forecasts in FW assessments.

Example 1: Forward-looking (FW) vs YoY assessment of avoided emissions for a *heat pump solution*

- **Year of sale**: 2023
- **Average reference solution**: market average heating solutions in 2023 are 90% gas boilers and 10% heat pumps
- **Lifespan**: 10 years for both the heat pump and gas boiler
- **Functional unit (FU)**: providing heating for an average residential house in the Netherlands for 10 years
- **Assumptions**: the solution is operational for the full year 2023 (*relevant for the YoY approach*)

Table 4. Calculation of emissions for the heat pump and gas boiler using FW and YoY approaches

Approach	GHG emissions (kg CO_2 eq.) per product	Production	Use/operation	EoL	Total emissions (10y)	Emission factor/year (10y)
FW	Gas boiler	5	20 (*over 10 years*)	5	5+20+5=30*	30/10=3
	Heat pump	10	10 (*over 10 years*)	5	10+10+5=25*	25/10=2.5
YoY	Heat pump	10	1 (from previous year, measured)	5	10+10+5=25	10/10+1+5/10=1+1+0.5=2.5

* The use-phase emissions factors used for the grid or gas mix are dynamic.

The average reference solution in 2023 (90% gas boiler and 10% heat pumps) remains fixed for the full lifespan of solutions sold in 2023, as defined in the functional unit. Table 5 shows the calculation of the AE.

Table 5. Avoided emissions results for the heat pump solution using the FW and YoY approaches

FW assessment | 2023-2032 (total)	YoY assessment | 2023
Emissions reference $_{total}$ – Emissions solution $_{total}$	Emissions reference $_{yearly}$ – Emissions solution $_{yearly}$
(30*0.9+25*0.1)-25 = 29.5-25 = **4.5 kg CO_2 eq.**	(3*0.9+2.5*0.1)-2.5 = 2.95-2.5 = **0.45 kg CO_2 eq.**

Definition of lifespan in the functional unit (FU)

Assuming that a solution doesn't exists at the moment when a company sells a solution, the company would sell the reference solution instead, for the entire lifespan of the reference, as the FU defines. This only applies to solutions with a lifespan of more than one year, so for instance not to consumables. The FU definition can reflect the lifespan of such solutions.

The reference may have the same or a different lifespan, meaning the solution could replace a reference with remaining lifetime. The assessment reflects this by defining the required quantity of the solution or reference to fulfil the FU (see Example 2).

Example 2: The definition of the FU of a heat pump solution with a lifespan of 10 years could be: "*Providing heating for an average residential house in the Netherlands for 10 years*". The required quantity of the solution depends on its lifespan, as seen in the different cases below.

Table 6. Cases where solution and reference lifespans differ and their relation to the assessment's FU

Case	Lifespan (years)	Required to fulfil the FU
Same lifespan		
Heat pump solution	10	1 heat pump
Gas boiler reference	10	1 gas boiler
Different lifespan		
Heat pump solution	10	1 heat pump
Gas boiler reference	15	10/15=0.67 gas boilers

Questions for consultation

- Are there situations where a fixed reference solution for solutions with a lifespan of more than 1 year is not appropriate?
- What are the benefits and challenges of including the lifespan in the functional unit? Is this in line with existing product-specific rules in the LCA context?
- Do the examples sufficiently help to understand the implications of a reference scenario definition for the FW and YoY approaches?

Recalculation of solution and reference scenario

Rationale for refinement

In practice, estimating the future avoided emissions of a solution and reference scenario often uses numerous assumptions (projections). This can significantly affect the AE calculation and results. Changes in assumptions and data over time may trigger a recalculation of a YoY and forward-looking assessment and adjustments to what the company is reporting. By adding guidance on recalculation, this refinement aims to support the integrity of claims and the application of the methodology in practice.

Addressed in Guidance: Not specifically addressed.

Proposed refinement

The forward-looking approach includes assumptions for the following aspects (non-exhaustive):

- Lifespan (also relevant for YoY)
- Maintenance needs
- Energy requirements
- Consumer behavior
- Rebound effects (also relevant for YoY)
- EoL treatment of solution (also relevant for YoY)

As described in Chapter 5 of the WBCSD and World Resources Institute *GHG Protocol: A corporate accounting and reporting standard* and Chapter 11 of the *GHG Protocol for Project Accounting*, different factors, such as structural changes in the reporting organization, changes in methodology, discovery of errors, the improvement in accuracy of activity data etc. can impose the recalculation of emissions.

If that happens, the two approaches require recalculation

- YoY: recalculate the base and subsequent years;
- FW: recalculate the base/reporting year including the forward-looking impact.

Evaluating assumptions and data used over time will help

- Include assumptions and data that are most accurate and up-to-date with the latest science and practices;
- Verify whether the reference scenario initially defined accurately represents reality;
- Regularly update the reference scenario to represent the latest market conditions or policies, so that solutions sold in later years do not use outdated reference scenarios.

We recommend the evaluation of the assumptions and data used and the potential recalculation of the GHG emissions at regular time intervals.

- Best practice: Yearly recalculation of baselines using latest available data or actual measurements instead of assumptions, for example through traceability and monitoring of a solution's performance;
- At a minimum: Recalculation every 2-3 years and no later than 5 years, even for solutions with long lifespans.

Questions for consultation

- To what extent will annual recalculation work in practice?
- Do you see any challenges in the proposed refinement?
- Which type of data sources do you use when creating or adjusting baselines (especially if not energy/grid mix related)?

7. Allocation

Rationale for refinement

If multiple stakeholders account for the same AE, this could lead to inconsistencies and risks of greenwashing. The purpose of allocation in the AE context is to ensure that the total AE accurately reflects the collective value chain effort to accurately reveal contributions from multiple components and implement practical methods for allocation.

Addressed in Guidance: Section 5.5.4: Double counting and avoided emissions

Proposed refinement

Companies should differentiate allocation approaches for avoided emissions impact based on the purpose, whether for corporate decision-making, financial planning, reporting, internal analysis or collaboration across the value chain. The refinement introduced in the Guidance takes a fundamental approach and aims to provide direction on when allocation may be useful (case-dependent) and provide good practice, by identifying two main situations: 1) allocation of AE between intermediary and end-use solutions; 2) allocation of AE across intermediary solutions contributing to one end-use solution. The allocation approach proposed mainly refers to situation 2.

Before applying allocation, companies should ensure that some key principles are in place to maintain accuracy and integrity:

- **System boundary definition**
  The establishing of clear boundaries for AE calculations, specifying the inclusion of the entire product life cycle or only the end-use, ensuring the capturing of all relevant emissions sources and reductions.
- **Transparency**
  Providing a detailed system diagram and clarifying the product's contribution to the total AE in the end-use, including all relevant components, to prevent double-counting and enhance credibility (such as a system boundary diagram and relationship of the solution under assessment to the end-use solution).
- **Collaboration with component providers**
  Engaging with other value chain actors to align on claims, ensure traceability and standardize monitoring methods for transparent and coordinated AE accounting.
  When performing allocation, it is generally good practice to make an effort to harmonize allocation approaches with other actors across the value chain.

Furthermore, where industry or sector guidelines on the attribution of avoided emissions exist, it is essential to follow these standards. This ensures consistency within sectors and alignment with best practices.

The allocation hierarchy proposed prioritizes accuracy to avoid cherry-picking.

1. **Exact contribution:** If it is possible to quantify the exact contribution of an intermediary, the company should use this value. For instance, if data demonstrates that new low-resistance tires contribute to 5% of an EV vehicle's avoided emissions, the tire manufacturer can claim that specific share (there are various ways to calculate attribution, such as smart devices, IoT on industry or machinery). This approach also applies when an intermediary can justify why 100% of the reduction is directly attributable to its solution.
2. **Other relationships:** In cases where other relationships, such as economic relationships or similar factors, can justify a proportional allocation of avoided emissions, the company should use these. For example, if the cost or value of a component is proportionally significant to the overall end-use solution, this relationship can help guide the split of emissions. Other

approaches may include: i) induced emissions; ii) weight; iii) other physical parameters; iv) mass-balance.

3. **Equal split**: If the number of intermediaries contributing to the end-use solution is known, the avoided emissions should be equally split across the intermediaries unless more precise data is available.
4. **Baseline fixed share:** As a default starting point, if no further data is available and the number of intermediaries contributing to a final solution is not known, each intermediary should have a fixed share of the total avoided emissions. This default share could be set between 5-10% of the total avoided emissions. Lower shares can be a push for the intermediary's producers to gather more information and move to the next steps in the hierarchy.

"Exact contribution" is the only approach that can ensure accurate allocation. Any other approach mentioned under 2, 3 and 4 above will lead to arbitrary choices and opportunities for cherry-picking. The need to offer a way to still be able to allocate impacts when the previous options are inapplicable drives the inclusion of approaches outside of the exact contribution in the refinement of the Guidance. Generally, avoided emissions metrics are hypothetical, realized outside of the reporting entity's operational control, often forward-looking and thus uncertain by nature. Therefore, while allocation approaches may be practical and useful in certain instances, it is important to apply them with caution in public disclosure or reporting (e.g. allocation should not be applied in formal sustainability disclosures or reporting) due to the inherent level of uncertainty.

Questions for consultation

- Should technical guidance address allocation, considering that AE assessments are hypothetical, often forward-looking figures with a high level of inherent uncertainty?
- In your view, which applications (e.g., corporate decision-making, financial planning, reporting, internal analysis or cross-value chain collaboration) would benefit most from the allocation approaches outlined? Are there specific applications where allocation would be particularly challenging or less relevant?
- How practical is the proposed hierarchy for AE allocation (e.g., exact contribution, economic relationships, equal split) in real-world applications? Are there concerns and would you suggest adjustments to support both accuracy and usability?

8. Data

Rationale for refinement

Include a more comprehensive section on data requirements to increase simplicity and conciseness of the data quality guidance for the company and support cost- and time-effective data collection on what matters most for the solution under assessment. The section will feature a data hierarchy that accounts for the principle of materiality for both end-use and intermediary solutions, as well as the reference scenario. It will also outline a selection of general principles that inspire good practice in data collection for consistency and quality.

Addressed in Guidance: Section 5.5.5: Recommended data sources for the calculation of avoided emissions

Proposed refinement

Data hierarchy

The selection of data types (meaning primary[6] and secondary[7]) for AE calculations, whether for end-use or intermediary solutions or a reference scenario, may follow a hierarchy that recommends minimum data quality levels based on a company's influence (operational or financial control) and access to information.

This differs from specificity levels (see section 5.8 of the *Guidance on Avoided Emissions*), which are a metric to classify data granularity into levels for emissions calculations.

The data hierarchy consists of the following **minimum data quality** recommendations and presented in Figure 2:

1. Activities inside a company's financial or operational control and access – companies should aim for primary data, which can be **site- or company-specific**;[8,9]
2. Activities outside a company's control but with access to information – **company-specific data (supplier or stakeholder)**;
3. For end-use and intermediary solutions and the reference scenario – **secondary data**;
4. Whenever possible, prioritize primary data over secondary data.

While the minimum data quality for the reference scenario is lower (meaning secondary), there is a preference for primary data. The reference can closely align with site-specific data.

- *For example, for asset-heavy equipment, the solution provider often knows the exact machinery replaced and can use site-specific data for both the reference and solution scenarios*.

In principle, the data quality of the solution scenario cannot be lower than that of the reference scenario for existing solutions.

Figure 2. Minimum data quality level based on solution type: life-cycle stage (LCS) LCS1: raw materials acquisition & pre-processing; LCS2: manufacturing; LCS3: distribution; LCS4: Use; LCS5: end-of-life

Good practices for data collection

To increase the quality of assessments, aim for overall alignment, collaboration and primary data exchange between stakeholders in a supply chain.

In addition, companies should adopt the following good practices for data collection to effectively address consistency, quality, evolving baseline and reference scenarios, and rebound effects.

- ***Refer to existing standards***: Use product-specific standards, such as ISO 22526, product category rule (PCR), product environmental footprint (PEF) category rule (PEFCR) for data collection, data quality indicators and requirements if applicable.
- ***Use uniform secondary data***: Ensure consistent secondary data in both the solution and reference scenarios
- ***Align assumptions***: Use the same foundational assumptions (e.g., broader narrative using IEA STEPS) for both scenarios to avoid biases.
- ***Document transparently:*** *Thoroughly report assumptions, limitations and data gaps and how they affect your assessment.*
- ***Proxies and data conflict:*** *Use proxies based on validated assumptions if data is lacking and choose conservative values when data conflicts.*
- ***Assess key assumptions:*** *Verify or disprove key assumptions, especially those that have a significant impact on AE calculations.*
- ***Improve key data points or assumptions:*** *Seek higher quality primary data, such as site-specific or actual measurements, to replace previously used key data points or assumptions with lower data quality or high impact.*

- ***Review data:***
  - *Conduct a yearly evaluation of updated data, from the same or new sources, to identify significant changes from the original assessment**.***
  - *Continuously verify data related to baselines, rebound effects and side effects and update as needed, especially for forward-looking assessments*

- ***Track trigger events**: Monitor major events (e.g., policy changes, shifts in net-zero strategy) that could affect assumptions or data, prompting a reassessment of AE evaluations if necessary.*

- ***Scenario assessment:** At a minimum, evaluate at least one scenario that includes the most extreme or conservative rebound effect alongside the expected or most likely scenario.*

Questions for consultation

- Do you agree with the minimum level of data quality for the solution scenarios? If not, what do you propose to change and how?
- Do you view these requirements as strict or do you see value in the proposed hierarchy that ranks available options to guide the company?
- What efforts do you undertake or do you consider reasonable to create better data transparency on downstream processes and use phases? What barriers and enablers do you see in this context?

9. Traceability and impact monitoring

Rationale for refinement

Include practical guidance on traceability and impact monitoring to assist practitioners in increasing the accuracy and credibility of their AE assessments, which in turn improves the integrity of claims.

Addressed in Guidance: Not specifically addressed.

Proposed refinement

Encouraging companies to implement traceability and impact monitoring for five key reasons:

1. Inform about the effectiveness of corporate climate action strategies and low-carbon solutions in the market.
2. Increase the accuracy of the avoided emissions assessment by monitoring the solution's performance; replace the initial key assumptions and data used with actual measured real-world data.
3. Enhance the quality of the assessment by moving from using estimated values to measurements.
4. Improve the credibility of avoided emissions claims and trust in companies communicating those as better validation will be possible.
5. Build closer relationships, trust, mutually beneficial incentives and synergies with customers and other actors (such as financiers) who depend on, contribute to or realize emissions reductions from low-carbon solutions.

Incentives to invest in traceability

- **Financial opportunities**: Companies that lead the way in sustainability and decarbonization with increased credibility can gain easier access to financing opportunities.
- **Regulatory compliance**: Monitoring key performance indicators related to AE reporting can enhance third-party review or accelerate audits.

Relevance of traceability of AE claims

Traceability and impact monitoring support the accuracy of calculations and therefore the integrity of claims and ultimately alignment with GHG inventory accounting and reporting. It also relates to other concepts outlined in the Guidance, namely:

- **Forward-looking and year-on-year approaches** – Traceability and impact monitoring can support the verification or improvement of key parameters (assumptions) and data. Examples include product use, energy consumption, lifespan, maintenance needs, rebound effects, consumer behavior, emission factors, LCI datasets, etc. Where significant variations occur compared to the initial data used, it is necessary to recalculate the AE.

- **Validation of a solution's implemented impact**: Continuous monitoring will help measure and verify actual use and "prove" the direct cause-effect chain, meaning the performance between the intervention and the AE of the solution, such as when updating machinery in factories or retrofitting a building for energy efficiency. Given that consumer behavior and potential rebound effects can significantly affect the viability of such projects, it is essential to monitor the use-phase performance.

Key challenges of impact monitoring across the value chain

Companies often face practical difficulties in implementing traceability and impact monitoring in practice.

In general, the following are key challenges:

- Seting up the right mechanisms/technologies to track different indicators;
- Aligning and collaborating among different actors in the value chain of a solution;
- Tracing and proving the use of an intermediary solution in an end-use solution;
- Understanding client or consumer behavior;
- Assessing potential rebound effects.

Some examples of good practices related to these challenges include:

- Where it is not possible to obtain live data from the supply chain, it is possible to use lab-based tests with a certain scientific robustness as proxy input data.
- Where it is not possible to obtain data from the use phase, it is possible to use consumer data collection mechanisms, such as surveys and market research groups, to generate data, along with internet of things (IoT) or smart technologies that can track the emissions of certain appliances.
- Where value chain actors produce data, companies should allow access to raw, unprocessed data alongside the processed data so that other actors can clearly interpret or incorporate the data in their calculations.

The validation of use-phase data is a major gap. Firstly, because solution providers often do not know where their solution ends up. Secondly, because it often depends on human behavior, which is difficult to capture, especially over the lifetime of a product. So solution providers find it difficult to get quality data. In addition, even if use and end-of-life data generated by downstream actors would be available, there is often no incentive to share this with upstream actors or, in some cases, it is difficult to do so given the number of upstream actors. Thus, there is a large opportunity for a two-way data flow **from and to** value chain actors relevant for the solution to allow for better traceability and impact monitoring for AE assessment validation. Below are some examples of (potential) tools to address that flow to the extent currently possible.

Sharing use-phase information with solution providers

Smart devices – such as sensors – can provide real-time and specific tracking. For example, the ECOFACT platform (Eco-innovative Energy Factory management) uses sensors to gather data in a factory, which enables the monitoring of energy-related KPIs in real time.

Sharing use-phase information both upstream and downstream

Internet of things (IoT) devices can monitor data and allow access by multiple value chain actors. Through blockchain technology, it enables secure and traceable record keeping, which supports the verification of the data. For example, the Digital Product Passport (DPP) initiative has the potential to share key product information among various value chain actors – industrial, consumer, research and development, financial, etc.

Questions for consultation

- Do you have other traceability and impact monitoring tools for consideration for inclusion in the Guidance?
- What are other ways to improve the accountability and credibility in avoided emissions claims?
- Do you know of any examples of traceability tools that allow for/incentivize downstream actors to share data with upstream value chain actors?

10. Aggregation, consolidation and reporting

Aggregation

Rationale for refinement

The Guidance allows companies to assess the avoided emissions of different solutions at the company level and provides brief instructions on double counting (step 5). Refinement by providing more detail on the aggregation of avoided emissions across intermediary and end-use solutions would prevent double counting. This will ultimately enhance the handling of consolidation at the company level, which supports transparency and use in decision-making by stakeholders.

Addressed in Guidance: Section 5.7, Step 5: Assess avoided emissions at the scale of the company (optional).

Proposed refinement

Consolidation of avoided emissions across intermediary and end-use solutions can be challenging at the company level. Four archetype conditions for aggregation could occur. Each comes with specific principles to enhance transparent accounting and prevent double counting:

1. *Different end-use solutions with distinct avoided emissions: sum up*
   Aggregating end-use solutions with distinct AE to a total is only permissible based on Guidance section 5.7.
2. *Distinct markets sell the same end-use solution: sum up under condition*
   Extrapolating the end-use solutions sold in different markets to another market is not possible. The avoided emissions of a solution and reference are market- and context-specific. Aggregation of AE for all markets can only take place following the calculation of the AE of the end-use solution separately.
3. *Intermediary and end-use solutions: do not sum up*
   Avoid aggregating intermediary solutions with end-use solutions to prevent double counting. That is, both types of solutions may address the same avoided emissions, which potentially leads to an overstatement of total avoided emissions.
4. *Multiple intermediary solutions: sum up under condition*
   Depending on the use case, it is possible to aggregate an intermediary solution's AE impact. Follow best practices (such as on necessary conditions as well as transparency regarding other relevant intermediaries) as the refined Guidance will share to prevent double counting, especially if an intermediary solution contributes to multiple end-use solutions.

Questions for consultation

- Do you agree with the overall principles for aggregation?
- If not, which principle do you propose to add or edit and how?
- Are any use cases not addressed by the aggregation guidance?

Consolidation and reporting

Rationale for refinement

The Guidance contains high-level guidelines and a template for reporting and communication (chapter 6). Explicit guidance on consolidation and more in-depth reporting requirements can refine this. The aim is to enhance transparency, as well as the interpretation and use of reported information for decision-making. Plus, this refinement builds on existing carbon accounting and reporting standards to enhance alignment.

Addressed in Guidance: Section 6.1: Guidelines for reporting avoided emissions.

Proposed refinement

- Companies shall report on the **context of recalculation** where there have been significant changes and the chosen policy for recalculation. Reporting on original and recalculated figures supports transparency.
- Companies shall report on avoided emissions in a **separate section of their sustainability report.**
- Companies shall **follow existing standards** (such as the GHG Protocol and Partnership for Carbon Accounting Financials (PCAF)) **for consolidating** avoided emissions.

Updates to reporting

This section is in addition to the refinement proposal on Recalculation, which recommends annual recalculation as best practice or based on the availability of more specific or updated data and assumptions, such as the triggering of the emissions of a solution in line with the events mentioned in the GHG Protocol and as proposed in the Recalculation of solution and reference scenario (theme 6) and Good practice for data collection (theme 8). These include structural changes in the reporting organization, changes to calculation methodologies and changes in the activities in the GHG inventory underlying the solution. A significance threshold of 5% or more holds for these changes to trigger a recalculation.

Where significant changes happen in the middle of the year, companies should recalculate the solution and reference AE for the entire year instead of only part of the year. The recalculation is different for the two approaches:

- Forward-looking: recalculation of all years back to the lifetime base year;
- YoY: recalculation of AE for the year prior to the change.

In all cases, companies must report on significant changes compared to the previous reporting period.

For validation purposes and in line with GHG Protocol, companies must define a recalculation avoided emissions policy and have quality procedures in place.

In addition, Section 6.2 of the Guidance should include adding the following reporting recommendations to the template.

KPIs

- Function and functional unit of the solution
- Absolute (metric tons CO_2) and intensity-based AE (metric tons CO_2/EUR € net revenue)
- % of AE linked to end-use or intermediary solutions

Methodology & data

- Data quality score based on standard followed OR a qualitative description in line with data quality hierarchy proposed in this refinement if not following a standard
- Key assumptions underlying the solution and reference scenario
- Baseline recalculation and explanation thereof in line with GHG Protocol or PCAF

Context

- Stakeholders, region, application, systems engagement, etc.

Questions for consultation

- Do you agree with the proposed additions to the text on Guidelines for reporting? If not, what do you propose to change?
- Do you agree with the proposed guidance on updates to reporting? If not, what do you propose to change?
- Are any elements from the reporting requirements missing? If yes, which ones?

Appendix

A selection of the intervention-based frameworks that informed the refinement proposals

- WBCSD and World Resources Institute GHG Protocol Project Accounting Standard
- International Council of Chemical Associations (ICCA)/WBCSD Avoided Emissions Chemicals Guidance
- WBCSD and World Resources Institute GHG Protocol Policy & Action Standard
- World Resources Institute Working Paper on Estimating and Reporting the Comparative Emissions Impacts of Products
- Glasgow Financial Alliance for Net Zero (GFANZ) Decarbonization Contribution Methodology
- The Institute of Life Cycle Assessment, Japan Guidelines for Assessing the Contribution of Products to Avoided GHG Emissions
- Mission Innovation Avoided Emissions Framework

Endnotes

[1] The recommended timeframe covers the most recent 12-month reporting period. If the inventory uses an earlier period, the company must provide assurance that there have been no significant changes to data, inventory boundaries, methods or other relevant factors since the calculation, in line with Section 5 of the GHG Protocol – A Corporate Accounting and Reporting standard.

[2] The 1.5°C pathway describes the ambition of limiting the temperature rise at 1.5°C by reducing scope 1 and 2 emissions, and limit it to well-below 2°C by reducing scope 3 emissions

[3] Examples include the United Nations Climate Change (UNFCCC) Recognition and Accountability Framework

[4] International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) Directives define an international standard as a document developed through the consensus of experts from many countries and approved and published by a globally recognized body. It comprises rules, guidelines, processes or characteristics that allow companies to achieve the same outcome time and time again.

[5] The user shall adhere to the system expansion principles as outlined in theme 2. In this example, the focus is on Principle 1, or "Gate 3 Check" with the assumption that the user also follows all other principles.

[6]) Primary data (adjusted from the product environmental footprint (PEF) method) – data from specific processes within the supply chain of the company carrying out the assessment. Primary data are site-specific, company-specific (if multiple sites for the same product) or supply chain specific. The company carrying out the assessment may obtain primary data through meter readings, purchase records, utility bills, engineering models, direct monitoring, material/product balances, stoichiometry or other methods of obtaining data from specific processes in the value chain. Primary data is a synonym for company-specific data or supply chain-specific data.

[7] Secondary data (adjusted from the product environmental footprint (PEF) method) – data that is not from a specific process in the supply chain of the company carrying out the assessment. This refers to data not directly collected, measured or estimated by the company but rather sourced from a third-party life-cycle inventory (LCI) database or other sources. Secondary data includes industry average data (e.g., from published production data, government statistics and industry associations), literature studies, engineering studies and patents and may also have a base in financial data and contain proxy and other generic data. Primary data that go through a horizontal aggregation step are secondary data.

[8] Site-specific data (adjusted from the product environmental footprint (PEF) method) – directly measured or collected data from one facility (production site).

[9] Company-specific data (adjusted from the product environmental footprint (PEF) method) – refers to directly measured or collected data from one or more facilities (site-specific data) that are representative of the activities of the company (company is a synonym for organization). It is synonymous with primary data.