

# Greenhouse Gas Generic Rulebook Consultation Responses

---

## **BackGround:**

The GBA's Battery Passport is GBA's flagship program to achieve full value chain transparency. The Battery Passport will provide trusted information on indicators related to responsible and sustainable practices, resulting in a 'quality seal' capturing authenticated records of the responsible sourcing, management, recycling and use of a battery across its full lifecycle.

Once completed, the Battery Passport program will include:

- A global reporting framework to govern rules around measurement, auditing, and reporting of ESG parameters across the battery value chain.
- A digital ID for batteries containing data and descriptions about the ESG performance, manufacturing history, and provenance as well as advancing battery life extension and enabling recycling.
- Harmonizing of digital systems collaborating across the value chain to report data into the battery passport.

The GBA has mobilized members to jointly establish consistent reporting rules for battery carbon footprinting – the GBA's Greenhouse Gas rulebook. The Rulebook is the first framework of its kind to facilitate the collection of standardised, auditable, and comparable GHG data for batteries.

The Rulebook aims to set out around 80 rules in an easy-to-use format for industry actors. It establishes the framework for consistent data collection for the GBA Battery Passport.

Following publication of the Global Battery Alliance's Greenhouse Gas rulebook for the battery

## **Purpose:**

Through this consultation, the GBA aims to attract diverse scrutiny to help ensure that the GHG Rulebook is as well designed as it can be to achieve the goal of providing Understandable, Standardized, Accurate, Differentiating, Auditable, Comparable carbon footprint results for batteries.

The GBA aims to achieve broad sectoral uptake of the GHG Rulebook beyond its membership

## **Decision-making:**

The GBA welcomes feedback and suggestions from all stakeholders and will consider all comments and submissions received via this website. An independent Project Management Office (PMO) develops and operationalizes the GBA Battery Passport according to the GBA principles. The GBA executive board delegates the operational and strategic guidance of the Battery Passport PMO to a dedicated Battery Passport Steering Committee (see GBA BP governance).

# Greenhouse Gas Generic Rulebook Consultation Responses

---

Please note that the consultation is not a poll and all comments to the public consultation will be collected by the secretariat for the consideration of the GBA's GHG Work Group regardless of how often they are repeated<sup>1</sup>. GHGWG decisions will be made using the GBA Consensus Way (SK-Prinzip®), i.e., by a process that considers the views of all GHGWG members and reconciles different needs until sustained resistance is minimised. Decisions taken this way are usually supported by all members, though they may not always be unanimous.

## **Greenhouse Gas Generic Rulebook Consultation Responses Report:**

This report details the consultation responses received and the GHGWG decision. There is a link to the original submission.

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	41	Respondent Name	Benedetta Nucci - European Aluminium	Comment Link	<a href="#">View Comment</a>
Section	Battery assembly				
Comment	<p>In case of integrated housing fulfilling additional functions for the vehicle, the virtual housing approach shall be used.</p> <p>For a description of the virtual housing approach please check the final report published by JRC in June 2023 detailing the rules for the calculation of the carbon footprint of EV batteries. Such approach is also included in the latest version of the PEFCR for Batteries under development in the Technical Secretariat.</p> <p>This is fundamental in case the results are used for comparison or benchmarking of different batteries.</p>				
Proposed Change	<p>In case of integrated housing fulfilling additional functions for the vehicle, the virtual housing approach shall be used.</p> <p>For a description of the virtual housing approach please check the final report published by JRC in June 2023 detailing the rules for the calculation of the carbon footprint of EV batteries. Such approach is also included in the latest version of the PEFCR for Batteries under development in the Technical Secretariat.</p> <p>This is fundamental in case the results are used for comparison or benchmarking of different batteries.</p>				
GBA Response	<p>We modified Chapter 6.4 on Batter Assembly to include the description of the virtual housing approach published by the EU Joint Research Centre in June 2023.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	55	<b>Respondent Name</b>	Achim Teuber	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Co-production of primary and secondary materials				
<b>Comment</b>	Slightly changed wording in this paragraph - see below in bold				
<b>Proposed Change</b>	Additionally, co-production of primary and secondary materials is applied in industry. <b>Pre-processed waste materials are refined together with primary materials.</b> For calculating the carbon footprint of such processes, the steps from waste collection to the pre-processed waste material (i.e. black mass) <b>shall</b> be accounted for, including steps that clean or scrub the pre-processed materials.				
<b>GBA Response</b>	We have modified the text accordingly.				

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	25	Respondent Name	Adriell Phoe	Comment Link	<a href="#">View Comment</a>
Section	Communication of the product carbon footprint calculation results				
Comment	<p>1. ‘Product Footprint calculation results shall consist of the dual, synchronous communication of both Rule Set 1 and Rule Set 2 results with the relevant methodological identifiers (HMA and PMA).’ – <i>This may not be feasible due to technical limitations of current market design (E.g. Renewable Energy Certificates lacking a timestamp for hourly generation and supply matching).</i></p> <p>2. ‘Members of the GBA shall actively refrain from accepting from vendors of their supply chain, and communicating to their downstream prospects or customers, a product carbon footprint calculation based on only one set of the two mandatory Rule Sets.’ – <i>This requires further clarification on GBA’s plans of an approved list of vendors or service providers.</i></p>				
Proposed Change	<p>1. For Rule Set 2, we recommend GBA perform further market studies to assess the feasibility and maturity of market participants to meet this requirement. Particularly, given GHG Protocol Scope 2 Guidance is currently under review, inclusion of this requirement should be pushed back. We recommend retaining only Rule Set 1 for now and aligning it with the current requirements of the GHG Protocol Scope 2 Guidance.</p> <p>2. We would like to clarify GBA’s plans to recommend or create a list of approved vendors who may have already implemented and/or automated the requirement to calculate their carbon footprint based on two mandatory Rule Sets.</p>				
GBA Response	<p>The GBA considered excluding Rule Set 1, excluding Rule Set 2, and keeping both Rule Sets. The most acceptable option for the group as a whole was to keep both Rule Sets. We have therefore maintained the dual reporting requirement in the GHG Rulebook.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	10	Respondent Name	Nano One	Comment Link	<a href="#">View Comment</a>
Section	Cut-off criteria				
Comment	<i>As systematic exclusion, only packaging is excluded:</i> Packaging at the moment is going to waste because considered contaminated, so not recycled. In a million ton CAM world, this means a significant amount of packaging, which has a GHG and broader environmental footprint. Recycling, reducing, eliminating packaging should be a goal				
Proposed Change	Include packaging in the tracking				
GBA Response	<p>Battery packaging may have a significant environmental footprint in total, or as a total output of a manufacturing company. However, previous studies have indicated that it is not a significant contributor to the carbon footprint of an individual battery pack.</p> <p>We have modified the Cut-off Criteria Chapter to include the following: "(The production of packaging materials shall be excluded from the battery supply chain, as the contribution to the overall impact has been estimated to be negligible according to the European Union's Product Environmental Footprint Category Rules for batteries)( Recharge, 2018)"</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	19	Respondent Name	Adriell Phoe	Comment Link	<a href="#">View Comment</a>
Section	Cut-off criteria				
Comment	<p>1. “The cut-off rule from the Commission Recommendation on the use of the Environmental Footprint (European Commission, 2021) has been adopted for the CF calculations. A maximum of 3% of greenhouse gas emissions may be excluded across the processes (cumulatively over all processes) for which primary data has to be collected referring to the overall CF of the product for which the CF is calculated. The exclusion shall also not exclude more than 3% of material or energy input or outputs cumulatively over the included processes.” – <i>Cut-off limits used here may not be aligned to that of the limits used in other LCAs based on other standards.</i></p>				
Proposed Change	<p>1. We would like to clarify the rationale for the cut-off limits with GBA as this discrepancy may result in adjustments made for the cut-off criteria of future LCAs.</p>				
GBA Response	<p>The rationale for the cut-off limits in the GHG Rulebook, was to match as much as possible the latest thinking of the European Union for its Batteries Regulation whilst remaining practical.</p> <p>The World Business Council for Sustainable Development, Together for Sustainability (chemicals industry), the Catena-X project (automotive) and the GBA have now all agreed to recommend the cumulative 3% cut-off for material inputs/outputs, energy inputs/outputs and contribution to overall product carbon footprint.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	30	Respondent Name	FernandoAntonanzas	Comment Link	<a href="#">View Comment</a>
Section	Cut-off criteria				
Comment	<p>The 3% threshold value of greenhouse gas emissions that may be excluded across processes is high and this will cause issues particularly to match this code with the integration of LCAs or EPDs for materials done with a 5%. Therefore, this will potentially be a source of mismatch and an inconvenience for usability of this code.</p>				
Proposed Change	<p>A maximum of 5% of greenhouse gas emissions may be excluded across the processes (cumulatively over all processes) for which primary data has to be collected referring to the overall CF of the product for which the CF is calculated. The exclusion shall also not exclude more than 5% of material or energy input or outputs cumulatively over the included processes. (...)</p> <p>The possible cut-off in secondary data is not included in the 5% cut-off criteria for a process for which primary data is collected.</p>				
GBA Response	<p>The rationale for the cut-off limits in the GHG Rulebook, was to match as much as possible the latest thinking of the European Union for its Batteries Regulation whilst remaining practical.</p> <p>The World Business Council for Sustainable Development, Together for Sustainability (chemicals industry), the Catena-X project (automotive) and the GBA have now all agreed to recommend the cumulative 3% cut-off for material inputs/outputs, energy inputs/outputs and contribution to overall product carbon footprint.</p>				



## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	13	<b>Respondent Name</b>	Nano One	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Data and Data Quality Requirements				
<b>Comment</b>	<ul style="list-style-type: none"><li>• <i>Nickel sulfate and cobalt sulfate</i>: As per previous comment, we should not limit tracking to metal sulfates because Nano One does not use sulfated inputs.</li></ul>				
<b>Proposed Change</b>					
<b>GBA Response</b>	<p>This chapter refers to specific data being collected for at least Nickel/Cobalt sulfates as predominant Hotspots, and was not intended to limit tracking to these.</p> <p>We have modified the bullet entry in the Data and Data Quality Requirements chapter to read as follows:</p> <p>"Nickel sulfate (or other) and cobalt sulfate (or other)"</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	22	Respondent Name	Adriell Phoe	Comment Link	<a href="#">View Comment</a>
Section	Data and Data Quality Requirements				
Comment	<p>1. ‘For purchased components and semi-finished materials not covered above, the GHG calculation ideally includes supplier-specific data for material, auxiliary, and energy consumption, including yields and / or scrappage, as well as waste and emission data. In case data from the supplier is not available, the user of the GHG Rulebook shall add to the material amounts in the components / semi-finished material generic processing steps used to produce the parts (e.g., aluminium die-cast, injection moulding of polymers, machining of steel or aluminium, etc.), covering, for example, energy and auxiliary consumption as well as yields. In case the CF is calculated for a product from the mining &amp; refining or anode material manufacturing cluster, and the producing company is not responsible for the entire supply chain, e.g., is purchasing metal concentrates, supply-chain specific data shall be used for the supply of these major input materials’ – <i>There may be reluctance among suppliers to provide supplier-specific data currently (unless there was a commercial benefit to them). This may result in difficulties in obtaining supply-chain specific data as required for products from the mining &amp; refining cluster.</i></p> <p>2. ‘Representativeness expresses the degree to which the data matches the geographical, temporal, and technological requirements. The aim is to use the most representative primary data for all processes and the most representative industry-average data as well as Defra data for transportation and IPCC emission factors or national emission factors under the UNFCCC GHG reporting for fuel combustion. Whenever such data are not available (e.g., no industry-average data available for a certain country), best-available proxy data need to be used and transparently reported (e.g., from a commercial database)’ – <i>Don’t think DEFRA should be directly prescribed. E.g. Some maritime analytics system goes further than DEFRA and estimates emissions based on specific vessel characteristics (rather than tonne.km method used by DEFRA). For emission factors, EN series of standards can also be used.</i></p>				
Proposed Change	<p>1. Further clarification needed on the definition of ‘supply-chain specific data’. Does it include scope 3 GHG emissions of suppliers, or only the scope 1 and 2 GHG emissions of suppliers to producing companies? This may present a significant challenge given the level of maturity of some suppliers (e.g. metal concentrates suppliers). While having full transparency across the supply chain is ideal, we recommend GBA to give further consideration to the value and need for this extent currently. This should be considered as a voluntary scope. We would also like more information on the extent to which GBA expects the Battery Passport to cover Scope 3 GHG emissions.</p> <p>2. Recommend not to limit transportation emission factors only to DEFRA, but consider broader library of transportation emission factors E.g., BS EN 16258; BSI; British Standards Institution (BSI);2012;</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

### GBA Response

1. The GHG Rulebook is provided to complement existing standards and methodologies on data collection. See Chapter 2 for reference to existing standards and methodologies, and see the definition of "primary data" for an explanation of "supply-chain specific data". See Chapter 3.3.2 on cut-off criteria for the extent to which GBA expects the Battery Passport to cover Scope 3 GHG emissions.

2. We have modified the Data and Data Quality Requirements chapter to include the following:

"Representativeness expresses the degree to which the data matches the geographical, temporal, and technological requirements. The aim is to use the most representative primary data for all processes and the most representative industry-average data as well as GLEC data for transportation and IPCC emission factors or national emission factors under the UNFCCC GHG reporting for fuel combustion. Whenever such data are not available (e.g., no industry-average data available for a certain country), best-available proxy data need to be used and transparently reported (e.g., from a commercial database)."

The GLEC Framework provides guidance on how to implement ISO14083 (which supersedes BS EN 16258) and incorporates use of relevant IPCC, DEFRA, GREET model data as well as internationally recognised emission factors for other regions (e.g., Australia).

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	45	<b>Respondent Name</b>	Achim Teuber	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Discharge and dismantling Allocation				
<b>Comment</b>	We added further specification of the allocation application				
<b>Proposed Change</b>	<b>(...) as presented in Chapter 3.4 may be required (See Chapter 3.4.1). The user of the rulebook shall assess the applicability of economic allocation. Thereby, the price of the components shall be taken as the basis. Only if these are not available, the value of the embedded materials may be used.</b>				
<b>GBA Response</b>	We have modified the text to include the following: "The user of this Rulebook shall assess the applicability of economic allocation taking the price of the components as the basis. Only if these are not available, the value of the embedded materials may be used."				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	42	Respondent Name	Benedetta Nucci - European Aluminium	Comment Link	<a href="#">View Comment</a>
Section	End of life and recycling allocation via the cut-off approach				
Comment	The classification of scrap is confusing				
Proposed Change	The classification of scrap in this section is not consistent with the classification provided in previous section of the rulebook. Please, use the same classification throughout the document.				
GBA Response	<p>We have modified the GHG Rulebook to avoid using the confusing term "scrap".</p> <p>We have modified Chapter 6.5.1. on End of life and recycling allocation via the cut-off approach to include the following: "The share of recycled materials shall be reported on the input side of a process or product to enable the producer to calculate the recycled content of the battery. Per Chapter 4.1.3, the amount of secondary material shall be reported in two categories as follows:</p> <ul style="list-style-type: none"><li>– Pre-consumer waste (manufacturing waste, excluding process revert)</li><li>– Post-consumer waste (end of life waste batteries)"</li></ul>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	5	<b>Respondent Name</b>		<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	End of life collection				
<b>Comment</b>	A little confusing compared to figure 5-28. Is the collection to be included in the GHG calculation of the recycled material or added to the footprint of the first life of the battery?				
<b>Proposed Change</b>					
<b>GBA Response</b>	We have modified Figure 5-28 to remove the reference to waste collection.				

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	38	Respondent Name	Benedetta Nucci - European Aluminium	Comment Link	<a href="#">View Comment</a>
<b>Section</b>	End-of-Life Allocation				
<b>Comment</b>	<p>For cradle-to-grave assessment, we recommend the use of the end-of-life recycling approach, also called substitution approach in this Rulebook. As an alternative we support the use of the Circular Footprint Formula as defined in the Recommendation EC 2021/9332</p> <p>The definition used for the classification of scrap are misleading</p>				
<b>Proposed Change</b>	<p>For cradle-to-grave assessment, we recommend the use of the end-of-life recycling approach, also called substitution approach in this Rulebook. As an alternative we support the use of the Circular Footprint Formula as defined in the Recommendation EC 2021/9332.</p> <p>When it comes to the classification of scrap, we would suggest revising the proposed classification by adopting the more common terms of post-consumer scrap, pre-consumer scrap and scrap of unknown origin. For pre-consumer scrap and post-consumer scrap you may refer to the definition included in ISO 14021. The use of the term “process scrap” may be misleading and should be better clarified.</p> <p>The rule “Process scrap within the same plant shall not be considered in calculating the recycled content rather only scrap or waste originating from outside the plant” is not aligned with the methodology used by European Aluminium, while it focuses on the fact that scrap are produced within or outside a specific plant, while European Aluminium approach will consider the point of the process in which the scrap are generated.</p> <p>According to the methodology used by European Aluminium, process scrap can be modelled as pre-consumer scrap provided that they are generated after the calculation point, i.e. process scrap issued from processes located beyond the system boundary / the gate. Process scrap generated before the calculation point, i.e. process scrap generated within the system boundary/the gate, are modelled as run-around scrap. If a different approach to differentiate between pre-consumer scrap and run-around scrap is used, the approach shall be clearly described in the LCA report.</p>				
<b>GBA Response</b>	<p>In the GHG Rulebook, only the carbon footprint for cradle-to-gate plus end-of-life is described (i.e., not cradle-to-grave). The Battery Pass project has found that it is technically infeasible to apply the end-of-life recycling approach and simultaneously align with the recycled-content rules of the European Union's Batteries Regulation.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

Taking into account stakeholder feedback overall (including during a public debate of 27/Jun'23), GBA members consider the Circular Footprint Formula a barrier to generating accurate, and differentiating battery carbon footprints, and one that potentially obscures from view the efforts required to ensure sustainable recycling of used batteries.

To surmount this barrier, the GBA requires use of the cut-off approach to EoL modelling, and provides Annex B to the GHG Rulebook with the Battery Pass project to enable optional use of the CFF in Europe.



## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	3	Respondent Name		Comment Link	<a href="#">View Comment</a>
Section	Energy consumption data allocation on production lines				
Comment	Considering the overall capital intensity of this value chain, I dont think it would be too much to ask for installation of dedicated meters. This costs only a couple of hundred Euros and would avoid judgement calls that can be misused to lower the allocation. This is bread and butter business of the plant engineers and or the fitters.				
Proposed Change					
GBA Response	We have modified Chapter 4.1.2 on Energy consumption data allocation on production lines as follows: "If there is a primary data collection for energy consumption taking place within the value chain where more than the considered product is produced in a plant and only one energy meter (e.g., for electricity) for several production lines is available, it is important to install a metering point per production line. If not enough individual meters are installed, partitioning of energy consumption between products becomes necessary. Considering the overall capital intensity of the Li-ion battery value chain, the most accurate way to determine the energy consumption per production line is a detailed metering system. Therefore, if not already available, a metering point per production line shall be installed by 31 Dec 2024."				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	23	Respondent Name	Adriell Phoe	Comment Link	<a href="#">View Comment</a>
Section	GHG data for supply of materials & energy and waste treatment				
Comment	1. 'In general, the use of secondary data from different sources can lead to different results in the carbon footprint calculation due to different methodology, system boundaries or coverage of GHG emissions between the different data sources. Therefore, the latest EF compliant data sets published under the EF node (European Commission, 2022) shall be used.' – <i>This data may not meet the requirements for representativeness in section 4.2</i>				
Proposed Change	1. Suggest that the use of EF node data is recommended in instances when it is representative for the activity. In instances where EF node data is not used, the rulebook could recommend or require entities to disclose the source of the factors used to facilitate comparability.				
GBA Response	As the term “Open-loop Allocation of Recycled Material” no longer appears in the Rulebook, it has been deleted.				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	40	Respondent Name	Benedetta Nucci - European Aluminium	Comment Link	<a href="#">View Comment</a>
Section	GHG data for supply of materials & energy and waste treatment				
Comment	Datasets are developed by using the Circular Footprint Formula				
Proposed Change	According to the text, the latest EF compliant data sets published under the EF node ( <a href="https://eplca.jrc.ec.europa.eu/LCDN/contactListEF.xhtml">https://eplca.jrc.ec.europa.eu/LCDN/contactListEF.xhtml</a> ), (European Commission, 2022) shall be used. Such datasets are however developed by using the Circular Footprint Formula, while the use of such CFF is not required by the GBA Rulebook. An assessment of the potential inconsistency should be performed. To solve the inconsistency we would suggest to consider using the Circular footprint formula for the modelling of the end of life and recycled content.				
GBA Response	We have modified Chapter 5.2.1 on GHG data for supply of materials & energy and waste treatment to include the following: "In general, the use of secondary data from different sources can lead to different results in the carbon footprint calculation due to different methodology, system boundaries or coverage of GHG emissions between the different data sources. Therefore, the latest EF compliant data sets published under the EF node ( <a href="https://eplca.jrc.ec.europa.eu/LCDN/contactListEF.xhtml">https://eplca.jrc.ec.europa.eu/LCDN/contactListEF.xhtml</a> ), (European Commission, 2022) shall be used, transparently noting that these datasets contain underestimates due to their use of the EU's Circular Footprint Formula. The combined effect of such underestimates shall be limited by maximising provision of primary data. Older versions of EF compliant data sets under the EF Node may be used if the process (energy or material supply, waste treatment etc.) is not available in the latest version."				

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	53	Respondent Name	Achim Teuber	Comment Link	<a href="#">View Comment</a>
Section	Hydrometallurgical treatment Allocation				
Comment	Battery Pass significantly changed the section to apply allocation hierarchy more clearly and improve the description. All differentiations between main / co products were deleted.				
Proposed Change	<p>Recycling processes are multi-output processes, i.e. having several valuable and functional outputs. For multi-output processes, the GHG emissions associated with the process shall be partitioned between the co-product(s) in a consistent way as per the generally defined allocation rules. In battery recycling, the target process outputs generally conform to battery-grade metal compounds (metal salts). Hydrometallurgical treatment yields a variety of co-products which varies depending on the complexity of the respective flowsheet.</p> <p>Generally, the target process output products are battery-grade nickel, cobalt, manganese and lithium compounds. Typically, sodium sulfate crystals, copper and graphite/carbon filter cake are produced as co-products.</p> <p>Following the multi-output allocation hierarchy (Chapter 3.4.1), it first has to be examined whether process sub-division applies. If sub-division can be applied, hydrometallurgical processes shall be further sub-divided into sub-process level under the conditions and guidance set out in Chapter 3.4.1.</p> <p>Where sub-division is not applicable, system expansion shall be investigated. If this is not applicable, allocation shall be applied. Even though nickel, cobalt, manganese and lithium compounds have alternative production routes, e.g., nickel sulfate and cobalt sulfate, these are not well-characterised and representative. There is no dominant route on the market producing these materials (see for instance GBA GHG Rulebook section 5.1.1. and 5.1.2.).<sup>[6]</sup> For co-products where the conditions of the allocation rules apply (e.g. sodium sulfate), system expansion substitution shall be applied. The credits for sodium sulfate – and other co-products – shall be calculated only after accounting for emissions from transport to the processing site and further treatment. For including transport emissions, the respective buyer-specific transport distances shall be applied. The user of these rules shall clearly classify for which co-products system expansion is applied and provide justification in the technical documentation. As there is likely no well-characterised and representative alternative process for copper, this potential co-product shall be partitioned via allocation in line with the allocation method applied to the co-products.</p> <p>As the criterion for applying system expansion to other process output products is not met, allocation shall be applied. If the price differential between output products surpasses four – as is likely given the example presented by Battery Pass (2023) Figure 13 – economic allocation shall be applied. Only</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

	<p>if the price differential is below four, mass allocation shall be applied for these outputs. The user of these rules shall determine the price differential based on the specific outputs of the process and apply the allocation classification. Allocation shall always be done at the point of separation. If this is ruled out, the applicability of system expansion needs to be checked.</p> <p>For modelling electricity, please refer to the Chapter 4.2.2.</p> <p><a href="#">[6]</a> Note that the identification of well-characterised and representative alternative routes for the applicability of system expansion requires knowledge of production processes that yield materials of the same quality and composition as those of the recycled product. It is recommended to refer to the relevant sections for the upstream processes in this rulebook.</p>
<b>GBA Response</b>	We have modified the text accordingly.

# Greenhouse Gas Generic Rulebook Consultation Responses

ID	54	Respondent Name	Achim Teuber	Comment Link	<a href="#">View Comment</a>				
Section	Hydrometallurgical treatment Allocation								
Comment	We included electrolyte and graphite as co-products in Table 5-64								
Proposed Change	<p>e.g., sodium sulfate (crystals), electrolyte, graphite</p> <table border="1" data-bbox="331 563 1093 619"> <tr> <td data-bbox="331 563 607 619">Co-products - Other</td> <td data-bbox="607 563 687 619">kg</td> <td data-bbox="687 563 801 619"></td> <td data-bbox="801 563 1093 619">e.g., sodium sulfate (crystals), electrolyte, graphite</td> </tr> </table>					Co-products - Other	kg		e.g., sodium sulfate (crystals), electrolyte, graphite
Co-products - Other	kg		e.g., sodium sulfate (crystals), electrolyte, graphite						
GBA Response	We have modified Table 6-64 accordingly.								

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	52	<b>Respondent Name</b>	Achim Teuber	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Hydrometallurgical treatment Data collection requirements				
<b>Comment</b>	Changed "need to" to "shall" in the following sentence				
<b>Proposed Change</b>	All relevant process emissions <b>shall</b> be included, for example potential sodium sulfate crystallisation as well as wastewater treatment which <b>shall</b> be accounted for in the process activity footprint calculation (see input/output Table 5-64)..				
<b>GBA Response</b>	We have modified the text accordingly.				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	51	Respondent Name	Achim Teuber	Comment Link	<a href="#">View Comment</a>
Section	Hydrometallurgical treatment Process description				
Comment	Refined route number (3) to remove the differentiation between main and co-products as we decided to call all outputs co-products:				
Proposed Change	(3) The third is a combination of (1) and (2) where <b>battery grade materials (NiSO<sub>4</sub> and CoSO<sub>4</sub>) are produced and non-battery grade intermediates (MnCO<sub>3</sub> and Li<sub>2</sub>SO<sub>4</sub>). Table 5-64 can be applied with the specification that MnCO<sub>3</sub> and Li<sub>2</sub>SO<sub>4</sub> are to be classified as co-products in the data collection. If these co-products are further treated to battery grade materials, the refinement process shall be included in the carbon footprint calculation.</b>				
GBA Response	<p>We have modified Chapter 4.1.1. on Multi-output Allocation to include the following:</p> <p>"In general, waste shall be modelled by attributing the waste burdens (e.g., from incineration or landfilling) to the process output products for which the carbon emissions are collected and calculated. The emissions from treating manufacturing waste, shall also be included with the burdens in the current life cycle. First, the collected activity data shall be classified in terms of whether the process output is waste or a co-product. In addition to the definition of co-product provided in this Rulebook, the distinction between waste and co-products shall be in alignment with prevailing legislation. Second, if the classification yields that the output is waste, the treatment process shall be identified. Third, as a general rule, process emissions shall be allocated to the process output products in the current lifecycle. Fourth, emissions data for the identified process shall be multiplied with the collected activity data."</p>				



## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	7	<b>Respondent Name</b>	Muthukumaran Sivaraman	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Introduction				
<b>Comment</b>	Should this be to all batteries irrespective of battery chemistry ?				
<b>Proposed Change</b>	LIB can be changed to all battery chemistries				
<b>GBA Response</b>	The focus of this version of the GHG Rulebook is lithium-ion batteries (LIB) for electric vehicles (EVs). Additional cathode chemistries e.g., solid state, and use-cases may be covered in subsequent versions.				

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	8	Respondent Name	UNECE Francois Cuenot	Comment Link	<a href="#">View Comment</a>
Section	Introduction				
Comment	<p>Excluding use phase might be problematic for GHG emissions, especially with respect to durability;</p> <p>I think you should battery manufacturers to comply with UN GTR No. 22 (adopted by EU, US, China, Japan,...), that provides technical requirements and minimum performance requirements for batteries fitted in electrified vehicles; that would prevent the introduction on the market of batteries that are good on the production and end-of life phases, but then only last for a limited time, requiring more frequent replacement; this would have a bad impact on overall GHG.</p> <p>I would be ok to exclude teh GHG from use phase, but would require all batteries to comply with UN GTR No. 22 (for batteries to be fitted in light duty vehicles). there is another UN GTR under development for batteries in heavy duty vehicles.</p> <p>not sure I get the meaning of the sentence "As the use cases for LIBs can be even different for the same battery product (location of use, mileage, lifetime, consumption of a vehicle, etc.), a comparison of GHG emissions from the <u>manufacturing</u> between batteries would be limited." why "manufacturing" here ? please elaborate</p>				
Proposed Change					
GBA Response	<p>We have modified the sentence in the Introduction to read as follows:</p> <p>"At this point in time, the use stage of LIBs is not considered in the Rulebook as the use cases for LIBs can be different even for the same battery product (location of use, mileage, lifetime, consumption of a vehicle, etc.). That said, the use phase might be covered in a future version of the Rulebook to provide a set of rules that allow for a consistent and homogenous comparison of LIB use in electric vehicles."</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	17	<b>Respondent Name</b>	Adriell Phoe	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Introduction				
<b>Comment</b>	1. Page 10 Terms and Definition - “Open-loop Allocation of Recycled Material” definition missing.				
<b>Proposed Change</b>	Page 10 Terms and Definition - Add definition for “Open-loop Allocation of Recycled Material”				
<b>GBA Response</b>	As the term “Open-loop Allocation of Recycled Material” no longer appears in the Rulebook, it has been deleted.				

# Greenhouse Gas Generic Rulebook Consultation Responses

ID	48	Respondent Name	Achim Teuber	Comment Link	<a href="#">View Comment</a>
Section	Mechanical pre-treatment / shredding Process description				
Comment	In the revision to v 1.1, we changed this section slightly - see bold changes - to incorporate graphite evaporation				
Proposed Change	<p>Mechanical treatment includes mechanically crushing/shredding (potentially with gas treatment under inert atmosphere) dismantled battery modules or cells (comminution), followed by air classification, sieving and magnetic separation. This yields black mass and, through some segregation processes, other co-products such as polymer flakes from separators, aluminium and copper fractions from foils or ferrous/non-ferrous metal fractions from the casing. <b>Additionally, one possible route for graphite treatment might be separation before the black mass is produced (see the example of graphite treatment in the box below which shall serve as the basis for deciding on treating co-products).</b> Drying can be a part of the mechanical treatment, yielding electrolyte as a co-product. The electrolyte treatment processes (<b>especially if thermally treated</b>) could lead to direct carbon dioxide emissions that need to be included in the CF calculation. The off-gas <b>emerging from this process</b> step is cleaned via condensing and an activated carbon filter which needs to be replaced and reprocessed periodically (Mohr, et al., 2020). The degree of mechanical processing varies and thus determines the amount of recovered materials as the amount and quality of recovered materials increases with more complex mechanical treatment. Subsequently, the black mass is pyrometallurgically processed before it goes into a final hydrometallurgical step or directly introduced into hydrometallurgical treatment.</p> <p>Potentially, entire battery packs are mechanically processed. This yields additional co-products such the fractions from the <b>battery/cell casing and wiring</b>.</p> <p><i>Example graphite treatment:</i></p> <p><b>The example of graphite highlights that battery recycling process outputs can vary strongly depending on the technical design. It shall serve as basis for classifying and accounting for typical co-products/waste from the respective recycling process steps (such as electrolyte). The recovery of graphite can follow four routes:</b></p> <p><b>(1) Separated in mechanical pre-treatment</b></p> <p><b>Graphite might be separated before the black mass is produced in the mechanical pre-treatment. Depending on the economic value</b></p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

	<p><b>(potentially as energy carrier substitute) and local waste legislation, the user of these rules shall determine whether graphite is to be treated as a co-product or waste.</b></p> <p><b>(1.1) Sold as co-product</b></p> <p><b>If the net economic value of graphite removed in the mechanical pre-treatment is above zero and local legislation does not classify it as waste, the allocation hierarchy in section 5.1.5 applies.</b></p> <p><b>(1 b) Incinerated (as waste)</b></p> <p><b>If the classification yields that the removed graphite is waste, the waste modelling approach in section 5.1.6 applies and burdens of further treatment shall be allocated to the output products of the mechanical pre-treatment step.</b></p> <p><b>(2) Thermally lost in pyrometallurgical or thermal pre-treatment</b></p> <p><b>The according carbon emissions from thermal treatment shall be accounted as direct process emissions with the carbon content of the graphite.</b></p> <p><b>(3) Recovered in hydrometallurgical treatment</b></p> <p><b>If black mass still contains graphite, it can be recovered through leaching in hydrometallurgical treatment. The rules in section 5.3.5 apply to recovered graphite as a co-product in the hydrometallurgical treatment.</b></p> <p><b>For all described routes, the quality of outgoing graphite shall be documented in the data collection as it is important for accounting associated emissions.</b></p>
<b>GBA Response</b>	We have modified the text accordingly.

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	27	Respondent Name	Adriell Phoe	Comment Link	<a href="#">View Comment</a>
Section	Mining and refining				
Comment	<p>1. 'It is recommended to collect 100% of the production process relevant data.' – <i>Collecting 100% of the production process relevant data may not be feasible.</i></p> <p>2. 'It is very important that for the main reference flows, the specific assay data on Nickel and other elements included are reported with the reference flows to allow a proper mass balance check' – <i>Obtaining specific assays for each component of the reference flow process may not be feasible and could make it difficult to comply.</i></p> <p>3. 'It is also important to calculate the transport between the different processes up to the final product' – <i>Does this mean the boundary should be drawn once the final finished NiSO<sub>4</sub>·6H<sub>2</sub>O is produced (i.e. excluding the downstream transport of products to customers?)</i></p>				
Proposed Change	<p>1. We would recommend referencing this to the 3% threshold used elsewhere in the Rulebook, and to apply this to the other cluster specific rules where relevant.</p> <p>2. Please define the expectation of the frequency that the assay data must be refreshed.</p> <p>3. Please confirm boundary for downstream transport here and in the other cluster specific rules, or alternatively in the transport section of the Rulebook.</p>				
GBA Response	<p>1. We modified Chapter 6.1 on Mining and refining to include the following:            "The cut-off rules are specified in the generic part of the rule book and shall be considered within this specific mining and refining cluster as well as all other clusters. It is recommended to collect as much of the production process relevant data as possible. So regular maintenance of equipment shall be included and is typically included in Life Cycle Assessment according to ISO 14040 / 44 (e.g., lubricants, grease, etc.)."</p> <p>2. The period for data collection is annual. This can be either the most recent available calendar year or the most recent available financial year.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

	<p>3. Each of the Tables in Chapter 6 calls for collection of data for transport of inputs from the gate of the supplier and transport of outputs to the gate of the customer.</p>
--	--

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	4	Respondent Name		Comment Link	<a href="#">View Comment</a>
Section	Multi-output Allocation				
Comment	<p>This formulation is still quite open and can allow misleading use. E.g. Producing Li-Hydroxide from Li-Carbonate will leave CalciumCarbonate, which usually would be reconverted to Quicklime in a Klin emitting CO2. Obviously I would need to include the CO2 in my calculations, but I could also stop at the Calcium Carbonate and sell this as a valuable co-product. The way I read this chapter is, that I can allocate some of my emissions to that Carbonate and even avoid including the CO2 in my balance. Obviously this is not the intention.</p>				
Proposed Change					
GBA Response	<p>The GHG Rulebook sets rules for determining the carbon footprint of an individual battery product. Chapter 3.3 describes the boundaries of the individual battery product system. Accordingly, if Calcium Carbonate or Quicklime is a waste from the system, emissions due to any waste treatment must be included in the carbon footprint of the battery. If, however, Calcium Carbonate or Quicklime is a co-product of the system, emissions from any subsequent treatment are excluded (as being beyond the system boundary or "after the gate").</p> <p>For clarity, we have modified the Sub-chapter on Primary Metallurgical Extraction from spodumene ore to include the following: “Following the general approach (see Chapter 4.1.1), any produced and sold calcium carbonate or quicklime shall be allocated by using system expansion according to Santero &amp; Hendry (2016) and supported by 3rd-party verified evidence.”</p>				



## Greenhouse Gas Generic Rulebook Consultation Responses

ID	11	Respondent Name	Nano One	Comment Link	<a href="#">View Comment</a>
Section	Multi-output Allocation				
Comment	<p><i>In case the price is only paid for the transportation, or the price is zero, but the by-product is used as input to another product system, processes to treat that output may be excluded from the CF calculation, but no partitioning of GHG emissions to that output shall be performed.</i> This may skirt the obligation to report significant GHG emissions. Treatment of the waste/byproduct may include and probably requires drying it for transport. Drying is likely only economical with natural gas, or heat generated from fossil fuel, or waste heat from the plant. It should be included in CF to incentivise waste heat use or more efficient dewatering techniques.</p> <p>Also, any partitioning of GHG would be weighted on the revenue of each product.</p>				
Proposed Change	Maintain the CF for waste and by-product				
GBA Response	<p>Chapter 3.3 describes the boundaries of the individual battery product system. Accordingly, if waste is dried for transport, emissions from drying must be included in the carbon footprint of the battery. Similarly, if by-product has been dried for transport, emissions from drying must be included (as still within the system boundary or "before the gate"). If, however, the price paid for the by-product is zero, or covers transport only, no GHG credit can be claimed for its supply.</p> <p>For greater clarity, we have modified Chapter 8 on Verification/Review to give some more general information about the GBA's current thinking and would welcome further suggestions in subsequent public consultations.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

<b>ID</b>	20	<b>Respondent Name</b>	Adriell Phoe	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Multi-output Allocation				
<b>Comment</b>	<p>1. ‘A by-product under the GHG Rulebook is defined as an output with an economic value above zero, for which demand at the specific production site is available, and evidence can be given that the by-product is used as intended.’ – <i>This requires further clarity for products without an index price.</i></p> <p>2. ‘In all cases, a third party shall verify the economic value of the by-product with specific properties (e.g., purity/grade, net calorific value, water content, etc.) at the facility gate, as well as the share of the by-product for which the price is paid. If no economic value of the by-product can be proven, the output shall be considered a waste.’ – <i>More clarification required for this paragraph.</i></p>				
<b>Proposed Change</b>	<p>1. We would like to clarify the approach that GBA requires to verify third party commercial information. This is in consideration of products that do not have index pricing and would rely on achieved contract price, which is commercially sensitive information.</p> <p>2. We would like to further clarify the requirement that ‘A third party shall verify the economic value of the by-product with specific properties (e.g., purity/grade, net calorific value, water content, etc.) at the facility gate, as well as the share of the by-product for which the price is paid. If no economic value of the by-product can be proven, the output shall be considered a waste.’ Is the intent to place a requirement on the auditor of LCA to obtain this evidence?</p>				
<b>GBA Response</b>	<p>A by-product under the GHG Rulebook is defined as an output with an economic value above zero, for which demand at the specific production site is available, and evidence can be given that the by-product is used as intended. If no economic value of the by-product can be proven, the output shall be considered a waste. The verifier of the battery carbon footprint would be expected to check any proofs or evidence associated with a high risk of error.</p> <p>For greater clarity, we have expanded Chapter 8 on Verification/Review.</p>				

# Greenhouse Gas Generic Rulebook Consultation Responses

ID	31	Respondent Name	FernandoAntonanzas	Comment Link	<a href="#">View Comment</a>
Section	Multi-output Allocation				
Comment	<p>The GBA GHG Rulebook specifies:</p> <ul style="list-style-type: none"> <li>• system expansion for sulfuric acid, ammonium sulfate, sodium sulfate, chlorine by-products etc.</li> <li>• mass allocation for metal products in the absence of precious metals and for co-products from brine</li> <li>• economic allocation for metal products in the presence of precious and for graphite products</li> </ul> <p>See Chapter 4.1.1. Therefore, we have not added the word "mass" where suggested.</p>				
Proposed Change	<p>Add the word “mass” allocation resulting as: “the partitioning of GHG emissions between product and co-product(s) shall be done by <u>mass</u> allocation for graphite and metals and by system expansion for other materials”.</p>				
GBA Response	<p>The GBA GHG Rulebook specifies:</p> <ul style="list-style-type: none"> <li>• system expansion for sulfuric acid, ammonium sulfate, sodium sulfate, chlorine by-products etc.</li> <li>• mass allocation for metal products in the absence of precious metals and for co-products from brine</li> <li>• economic allocation for metal products in the presence of precious and for graphite products</li> </ul> <p>See Chapter 4.1.1. Therefore, we have not added the word "mass" where suggested.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	43	Respondent Name	Benedetta Nucci - European Aluminium	Comment Link	<a href="#">View Comment</a>
Section	Outlook				
Comment	<p>Reference to Table B1 of Annex B - I could not post the comment on the relevant page. sorry for this</p> <p>some content is not fully comprehensive when compared to the text of Recommendation 2021/9332</p>				
Proposed Change	<p>Reference to Table B1 – please refer to Part II of Annex C (excel file) of the Recommendation 2021/9332 that includes the default values to be included in the CFF. For the A value a reference to this excel file shall be included, rather than specifying the A value in such simplified way. Some comment applies for all other parameters.</p> <p>In Annex B the rule for the calculation of PEF for intermediate products shall be included. Such rules are detailed in the Recommendation 2021/9332, section 4.4.8.13 on “How to apply the formula to intermediate products (cradle-to-gate studies)”. The rulebook shall require the delivery of two datasets for semi-finished and intermediate products to downstream actors, one calculated with the allocation factor equals to A<sub>mat</sub> and one additional dataset calculated with A=1. The dataset with A<sub>mat</sub> shall then be the one used for the calculation of the carbon footprint of the final battery. This double reporting would allow companies not only to calculate a compliant CF of their batteries, but also to implement sourcing strategies of the raw materials that would meaningfully drive towards the decarbonisation of the sector.</p> <p>We recommend the choice of E*v as a fixed that will depend on the region in which the recycling is expected to take place (fixed E*v, that in the case of this specific regulation should be representative of the European production of the materials or if not available the global production of the materials). To avoid the generation of negative results, we would then recommend to impose E*v=Ev when Ev is lower than the fixed E*v.</p>				
GBA Response	<p>The text of the GHG Rulebook Annex B refers to Part II of Annex C (excel file) of the Recommendation 2021/9332.</p> <p>We have modified Table B-1 to explain it is an example only to be replaced with specifications of the EU’s Batteries Regulation once adopted.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	16	<b>Respondent Name</b>	Nicole Hanson	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Preface				
<b>Comment</b>					
<b>Proposed Change</b>	The LME wanted to take this opportunity to commend you on formulating this guidance and promoting the need to standardise GHG methodologies throughout the battery value chain. We recognise the need for reliable, trusted and accessible data to achieve greater transparency and believe this rulebook is well positioned to forward this goal. We will follow updates and hope the uptake is successful.				
<b>GBA Response</b>	Thank you.				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	34	<b>Respondent Name</b>	Ingo Steinke	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Preface				
<b>Comment</b>	<p>It is recommendable to determine requirements for the marketing of rechargeable batteries on a global level, by considering different parts such as the placing on the market or putting into service, re-use, repurposing, due diligence policies and the digital battery passport.</p> <p>The GHG Rulebook is providing a methodology for the calculation of the carbon footprint, so it is to be considered as a guideline, with only some kind of requirements.</p> <p>The GBA foresees on his webpage the allocation of labels or seals. In general, such markings or labels include a concrete statement for the public. So, within the single market manufacturers declare with the CE marking, that all relevant and applicable legislative requirements are fulfilled.</p> <p>Therefore, we strongly recommend to set up a regulatory structure, which can serve as a basis for different markets, and so with different regulatory requirements.</p>				
<b>Proposed Change</b>					
<b>GBA Response</b>	<p>We have modified Chapter 8 on Verification/Review to give some more general information about the GBA's current thinking and would welcome further suggestions in subsequent public consultations.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	9	Respondent Name	Nano One	Comment Link	<a href="#">View Comment</a>
Section	Production definition				
Comment	<ul style="list-style-type: none"><li>• Metal sulfate (Nickel &amp; Cobalt): Nano One uses non-sulfated metals in its CAM production. Tracking should not be limited to Nickel/cobalt sulfates</li></ul>				
Proposed Change					
GBA Response	<p>This chapter refers to a "focus" on Nickel/Cobalt sulfates as predominant Hotspots, and was not intended to limit tracking to these. We have modified the bullet entry in the Production definition chapter to read as follows:</p> <p>"Metal compounds (Nickel &amp; Cobalt)"</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	18	<b>Respondent Name</b>	Adriell Phoe	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Production definition				
<b>Comment</b>	1. Manufacturing processes – consider splitting “mining and refining” into two separate processes as these are not always integrated.				
<b>Proposed Change</b>	1. GBA to consider splitting mining and refining into two manufacturing processes.				
<b>GBA Response</b>	At the beginning of the Rulebook project, the GBA considered splitting mining and refining into two manufacturing processes. As can be seen from the Figures in Chapter 6, for each material there are several production routes possible. Therefore, the GBA opted to group the descriptions of mining & refining by material for ease of understanding.				



# Greenhouse Gas Generic Rulebook Consultation Responses

<b>ID</b>	50	<b>Respondent Name</b>	Achim Teuber	<b>Comment Link</b>	<a href="#">View Comment</a>				
<b>Section</b>	Pyrometallurgical treatment Allocation								
<b>Comment</b>	Minor edits below in bold								
<b>Proposed Change</b>	<p>If system expansion is not applicable, economic or mass allocation shall be applied depending on the price differential <b>of the co-products</b> (See Chapter 3.4.1).</p> <p>Table 5-63</p> <p>Calculated based on reductants (stoichiometry), <b>graphite carbon content</b></p> <table border="1" data-bbox="331 735 1211 826"> <tr> <td>Direct GHG emissions</td> <td>kg</td> <td></td> <td>Calculated based on reductants (stoichiometry), <b>graphite carbon content</b></td> </tr> </table>					Direct GHG emissions	kg		Calculated based on reductants (stoichiometry), <b>graphite carbon content</b>
Direct GHG emissions	kg		Calculated based on reductants (stoichiometry), <b>graphite carbon content</b>						
<b>GBA Response</b>	We have modified Table 6-63 accordingly.								

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	12	Respondent Name	Nano One	Comment Link	<a href="#">View Comment</a>
Section	Recycled content of materials				
Comment	<p><i>The calculation of the recycled content in the GBA GHG Rulebook is limited to the metals: cobalt, lithium and nickel in the active material, as required by the proposed EU regulatory framework for batteries (European Commission, 2020):</i> Criteria should not be based on a specific national or supra-national body, such as the EU, if the Battery Passport aims to be universal.</p> <p>Even though LFP batteries represent a marginal percentage of batteries produced in Europe and the US in 2023, projections show this will increase significantly in upcoming years. Iron and phosphate will need to be recycled, as well as LFP batteries as a whole. This GHG footprint needs to be accounted for.</p>				
Proposed Change	<p>-Not align on one regulatory body</p> <p>-Make sure LFP is accounted for</p>				
GBA Response	<p>We have modified Chapter 4.2 on Recycled content of materials to include the following:</p> <p>"The calculation of the recycled content in the GBA GHG Rulebook is limited to the following components: housing, cables, printed circuit boards, anodes, cathodes and electrolytes.</p> <p>It is essential that over the entire supply chain, the information about the recycled content within a raw material (e.g., metal sulfate), the pCAM or CAM and the cell are handed over to the next process step / manufacturer with regard to the final battery product, e.g., the CAM manufacturer needs to know the share of recycled cobalt, nickel, manganese or iron and phosphate and lithium carbonate / hydroxide used in the CAM production and submit this information to the cell manufacturer. Then, a transparent recycled content of the active materials can be calculated. The user of the Rulebook shall therefore calculate the recycled content of the six components: housing, cables, printed circuit boards, anodes, cathodes and electrolytes in relation to the relevant reference unit and submit this information together with the GHG impact.</p> <p>The user should calculate an additional recycled content value that includes all recycled materials within its product."</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---


ID	32	Respondent Name	FernandoAntonanzas	Comment Link	<a href="#">View Comment</a>
Section	Recycled content of materials				
Comment	<p>The following statement in bold characters “Process scrap in a production facility shall not be included in the calculation of the recycled content. “ is inconsistent with the above explanation in the same section in which pre-consumer scrap is accounted within the recycled content "Process scrap and end-of-life waste are accounted for in the calculation of the recycled content and expressed in percentage of the product weight.". Please, clarify it or remove it in order to avoid miss-understandings.</p>				
Proposed Change	<p>Remove: "Process scrap in a production facility shall not be included in the calculation of the recycled content" to be consistent with the first sentence of this section.</p>				
GBA Response	<p>We have modified the GHG Rulebook to avoid using the confusing term "scrap".</p> <p>We have modified Chapter 4.2 on Recycled content of materials to include the following:            "Pre-consumer waste in a production facility shall not be included in the calculation of the recycled content. To calculate the recycled content for a LIB, it is important to consider that only the secondary materials that end up in the final product are relevant."</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	39	Respondent Name	Benedetta Nucci - European Aluminium	Comment Link	<a href="#">View Comment</a>
Section	Recycled content of materials				
Comment	The text states that “process scrap and end-of-life waste are accounted for in the calculation of the recycled content”.				
Proposed Change	<p>The text states that “process scrap and end-of-life waste are accounted for in the calculation of the recycled content”. We would suggest including in the recycled content process scrap (preferably renamed pre-consumer scrap), end-of-life waste (preferably renamed post-consumer scrap) and waste from unknown origin (preferably renamed as scrap of unknown origin).</p> <p>For the inclusion of process scrap in the calculation of the recycled content, please refer to the comment to section 3.4.3.</p> <p>The calculation of the recycled content may be allowed also for other metals in addition to cobalt, lithium and nickel.</p>				
GBA Response	<p>We have modified the GHG Rulebook to avoid using the confusing term "scrap".</p> <p>We have modified Chapter 4.2 on Recycled content of materials to include the following: "Recycled content may only be derived from pre-consumer waste and end-of-life waste and shall be expressed in percentage of the product weight."</p>				

# Greenhouse Gas Generic Rulebook Consultation Responses

ID	44	Respondent Name	Achim Teuber	Comment Link	<a href="#">View Comment</a>
Section	Recycling Data collection requirements				
Comment	In the Battery Pass version 1.1, we added a new section on pre-consumer waste allocation - potentially, this is something you can integrate in the generic section of the rulebook? If not relevant, please ignore :)				
Proposed Change	<p>The allocation of pre-consumer manufacturing waste shall follow a consistent application of these rules when collecting the activity data and attributing related carbon emissions. In general, waste shall be modelled by allocating the waste burdens (e.g. from incineration or landfilling) to the process output products for which the carbon emissions are collected and calculated. The emissions from treating manufacturing scrap, which is material that is recovered in further operations (e.g. recycling), shall also be attributed with the burdens in the current life cycle. Figure X shows the modelling approach for pre-consumer / manufacturing waste. First, the collected activity data has to be classified in terms of whether the process output is waste or a co-product. In addition to the definition of co-product provided in this Rulebook (net economic value above zero, the distinction between waste and co-products shall be in alignment with prevailing legislation. Second, if the classification yields that the output is waste, the treatment process shall be identified. Third, as a general rule, process emissions shall be allocated to the process output products in the current lifecycle. Fourth, emissions data for the identified process shall be multiplied with the collected activity data.</p> 				
GBA Response	<p>We have modified Chapter 4.1.1. on Multi-output Allocation to include the following:</p> <p>"In general, waste shall be modelled by attributing the waste burdens (e.g., from incineration or landfilling) to the process output products for which the carbon emissions are collected and calculated. The emissions from treating manufacturing waste, shall also be included with the burdens in the current life cycle. First, the collected activity data shall be classified in terms of whether the process output is waste or a co-product. In addition to the</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

definition of co-product provided in this Rulebook, the distinction between waste and co-products shall be in alignment with prevailing legislation. Second, if the classification yields that the output is waste, the treatment process shall be identified. Third, as a general rule, process emissions shall be allocated to the process output products in the current lifecycle. Fourth, emissions data for the identified process shall be multiplied with the collected activity data."

# Greenhouse Gas Generic Rulebook Consultation Responses

ID	6	Respondent Name	T&E	Comment Link	<a href="#">View Comment</a>
<b>Section</b>	Rule Set 1: Harmonized Market Approach (HMA)				
<b>Comment</b>	<p>The Rule Set 1 (Harmonized Market Approach) is designed to allow the use of market-based mechanisms such as guarantees of origins (GoOs). In particular, the rule considers the quantity of electricity consumed by the site over a whole year without ensuring that the energy injected into the grid by the contracted asset is matching the actual consumption of the site at any given time.</p> <p>This rule opens the door to substantial greenwashing opportunities as battery makers can set up in regions with a high carbon intensive energy grid and then buy their way (via GoOs) to a low carbon footprint through cheap green certificates, instead of encouraging low carbon generation in the regional market. In addition, such a rule does nothing to reward those battery companies that made location near low carbon energy sources part of their business case to directly reduce carbon footprint of their operation. Evidence shows that the GoOs price/design is insufficient to bring any additional renewables on the grid to compensate for the additional demand from battery factories.</p> <p>For instance, a production site would be able to consume electricity generated from fossil fuels in Germany during the evening in winter while claiming to use renewable energy that was actually produced in Spain at midday in summer. In this example, the consumption of the site would lead to an increase in the grid electricity demand in winter and consequently lead to an increase in the electricity generation from dispatchable fossil fuels power plants.</p> <p>The Rule Set 2 (Physically Modelled Approach) effectively closes this loophole by ensuring that “only the fraction of energy injected into the grid by the contracted asset demonstrated to lie below the load curve of the energy using facility, as demonstrated on an hourly basis by the date/time stamp of each instrument, shall be taken into consideration”. This rule also is a lot more effective in incentivising low carbon battery manufacturing, and is therefore aligned with the GBA’s vision.</p>				
<b>Proposed Change</b>	Our preferred option would be to exclude rule set 1 from the rulebook, and rule set 2 should be kept. In any case, keeping rule set 2 is our red line.				
<b>GBA Response</b>	<p>The GBA considered excluding Rule Set 1, excluding Rule Set 2, and keeping both Rule Sets.</p> <p>The most acceptable option for the group as a whole was to keep both Rule Sets.</p> <p>We have therefore maintained the dual reporting requirement in the GHG Rulebook.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	14	Respondent Name	Nano One	Comment Link	<a href="#">View Comment</a>
Section	Rule Set 1: Harmonized Market Approach (HMA)				
Comment	It is important to make sure certificates of origin, or other calculation methods do not result in displacing the carbon footprint of the energy grid to other segments of the market like residential or other industries that are not accountable from a GHG perspective. Even in the case where new dedicated renewable power capacity is built by the State for battery production, it may not result in net GHG reduction if that investment does not reduce the global GHG of the national grid. We consider that in all cases, State GHG emissions should be included and reflected in the production of the battery.				
Proposed Change					
GBA Response	<p>The GBA considered excluding Rule Set 1, excluding Rule Set 2, and keeping both Rule Sets. The most acceptable option for the group as a whole was to keep both Rule Sets. We have therefore maintained the dual reporting requirement in the GHG Rulebook.</p> <p>To address the risk of displacement of carbon footprint to other segments of the market, an additionality criterion has been included in Rule Set 2 (See Chapter (5.2.2)).</p>				



# Greenhouse Gas Generic Rulebook Consultation Responses

ID	24	Respondent Name	Adriell Phoe	Comment Link	<a href="#">View Comment</a>
Section	Rule Set 1: Harmonized Market Approach (HMA)				
Comment	<p>1. ‘Rule Set 1, Case C - Internationally recognized data sources shall be preferred. Amongst such well recognized data sources is the International Energy Agency (IEA) grid emission factors yearly publication’ – <i>Unclear definition of what the ‘internationally recognized data sources’ includes and how these data sources would likely be available for calculating GHG emissions.</i></p> <p>2. Rule Set 1, Case C -In the case of very large countries such as the USA, Canada, Russia and China, in which several electrical grids operate, the grid specific residual mix (if available) or the country-specific consumption Emission Factor (EmF) (if available) shall be used.’ – <i>Not yet available for Australia.</i></p> <p>3. Rule Set 1, Case B ‘Attribute tracking instruments taken into consideration for a given calendar year shall be restricted to instruments corresponding to energy produced within the prior 12 months’ – <i>This is stricter than the current requirement for market-based reporting in Australia (generation date less than 36 months prior to the end of reporting year). GHG Protocol Scope 2 Standard is silent on a specific time period, but states that it should be as close as possible to the date of generation. Rule Set 1, Case B ‘and their quantity shall be limited by the quantity of electricity consumed by the site for that year minus the quantity of electricity acknowledged under case A for that same year’<sup>3</sup>[<sup>3</sup> The GBA shall reconsider this 12-month time period no later than December 31, 2025].’ – <i>This goes beyond what GHG Protocol Scope 2 Standard prescribes, and dependent on how case A is interpreted “Electricity is supplied from a production asset connected to the energy using plant by means of a direct and dedicated connection....Remote electricity production assets are usually not connected to an energy using plant by means of a direct and dedicated connection, but rather through the electrical grid, and therefore do not usually fall under this case.”</i></i></p> <p>4. ‘Rule Set 2, Case A, figure 4-1 - In this chart, only “area 3” energy can be counted as used by the site, with the asset specific EmF. The energy present in “area 2” is either wasted or injected into the grid and cannot be associated with the site consumption’ – <i>Currently, these requirements are typically out of scope for what the LCAs are set out to do.</i></p>				
Proposed Change	<p>1. We would recommend clearly defining what the internationally recognized data sources are - E.g. published emissions factors by national Governments. We consider that these EmFs should be recognized. We would also recommend a clear definition of the other indicators which can be used.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

	<p>2. Neither a grid specific residual mix or country-specific consumption Emission Factor are currently available in some other large countries such as Australia.</p> <p>3. We will require more clarity on Case A and how it works with Case B. Also, we suggest that the Rulebook remains aligned with the GHG Protocol Scope 2 standard in this respect.</p> <p>4. We would recommend a transitional period for this aspect of the calculation to ensure appropriate infrastructure and IT systems are in place to do this.</p>
<b>GBA Response</b>	<p>1. GBA members consider that the International Energy Agency (IEA) grid emission factors published yearly appear to be specific enough for this purpose.</p> <p>2. EmFs published yearly by the IEA include data for Australia reported on a fiscal year basis. By convention, data for the fiscal year that starts on 1 July Y-1 and ends on 30 June Y are labelled as provisional EmFs for year Y.</p> <p>3. If electricity is not supplied via a direct and dedicated connection between a production asset and the energy using plant, privately held transmission assets which deliver power to multiple commercial users should be considered a "grid" as described under Cases B and C. GBA ambition is to remain aligned with, but less ambiguous than existing GHG Protocols in order to achieve higher comparability of results. EmFs published yearly by the IEA include data for Australia reported on a fiscal year basis.</p> <p>4. We modified Chapter 5.2.2 on Electricity: Two sets of calculation rules to include the following transition period:</p> <p>"Case B of Rule Set 2 will not apply until 1st January 2027 to provide companies with the opportunity to adjust their supply arrangements and establish the required information streams to demonstrate hourly matching through the recording of instrument date/time stamps. In the meantime, Rule Set 2 Cases A and C shall remain in effect."</p>

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	28	Respondent Name	Benedicte Robertz	Comment Link	<a href="#">View Comment</a>
Section	Rule Set 1: Harmonized Market Approach (HMA)				
Comment	<p>The goal is to present the two methods as fairly as possible. Additionally the call for governments to develop residual grid mixes, which was agreed during the Baar meeting in September 2022, is now also made.</p>				
Proposed Change	<p>Rule Set 1: Harmonized Market Approach (HMA)</p> <p>The underlying philosophy of this approach is to guarantee as good as possible the uniqueness of claims. The market-based mechanisms allow electricity consumers that have entered into agreements, in which the ownership of bundled or unbundled electricity attributes (such as REC<sup>[1]</sup>s and GoO<sup>[2]</sup>s) is transferred to these entities, to fully claim (under the criteria set below) the benefits of these attributes. Although the physical plausibility is weaker than in Rule Set 2(PMA), Rule Set 1(HMA) guarantees better the uniqueness of the claims. Where residual grid mixes are not available, the GBA calls for local governments to introduce this concept in order to guarantee everywhere the uniqueness of the claims.</p>				
GBA Response	<p>The GBA considered excluding Rule Set 1, excluding Rule Set 2, and keeping both Rule Sets. The most acceptable option for the group as a whole was to keep both Rule Sets. We have therefore maintained the dual reporting requirement in the GHG Rulebook.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	35	Respondent Name		Comment Link	<a href="#">View Comment</a>
Section	Rule Set 1: Harmonized Market Approach (HMA)				
Comment	<p><i>FREYR Battery is of the opinion that electricity modelling should</i></p> <ol style="list-style-type: none"> <li><i>1. Be done according to only one methodology (no dual reporting) to make clear comparison possible</i></li> <li><i>2. Documentation of the carbon footprint of the electricity used should be connected as much as possible to the actual electricity used/contracted.</i></li> </ol> <p><i>FREYR Battery therefor does not support GBA Rule Set 1.</i></p>				
Proposed Change	Take out the whole chapter and only keep Rule Set 2 (with changes as comment below).				
GBA Response	<p>The GBA considered excluding Rule Set 1, excluding Rule Set 2, and keeping both Rule Sets. The most acceptable option for the group as a whole was to keep both Rule Sets. We have therefore maintained the dual reporting requirement in the GHG Rulebook.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	29	<b>Respondent Name</b>	Benedicte Robertz	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Rule Set 2: Physically Modelled Approach (PMA)				
<b>Comment</b>	The goal is to present the two methods as fairly as possible.				
<b>Proposed Change</b>	<p>Rule Set 2: Physically Modelled Approach (PMA)</p> <p>The underlying philosophy of this approach is to reflect the physical plausibility as good as possible. Additionally, the efforts undertaken by electricity users to support the investment in low carbon production assets are still being acknowledged by allowing electricity users to claim the benefits generated by bundled electricity attributes meeting strict criteria. Although Rule Set 2 (PMA) includes a high risk of double counting of low carbon electricity claimed under other legally accepted accounting systems, the physical plausibility is higher compared to Rule Set 1 (HMA).</p>				
<b>GBA Response</b>	<p>The GBA considered excluding Rule Set 1, excluding Rule Set 2, and keeping both Rule Sets. The most acceptable option for the group as a whole was to keep both Rule Sets. We have therefore maintained the dual reporting requirement in the GHG Rulebook.</p>				

# Greenhouse Gas Generic Rulebook Consultation Responses

ID	36	Respondent Name		Comment Link	<a href="#">View Comment</a>
<b>Section</b>	Rule Set 2: Physically Modelled Approach (PMA)				
<b>Comment</b>	<p><i>For Rule Set 2 the following changes are recommended:</i></p> <ol style="list-style-type: none"> <li>1. <i>Additionality as a requirement to the asset(s) in question should not apply. There is no difference to the carbon footprint of a electricity producing asset depending on its age. GBA’s proposal would fex rule out most of renewable hydropower in the Nordic countries. This is not acceptable. It is FREYR Battery’s view that stimulus to building additional capacity of renewable energy will derive from the carbon accounting rules through the market drivers it will create and should not be part of accounting rules for carbon footprint. If GBA decides to insist on additionality for Rule Set 2 then it is FREYR Battery’s opinion that it must also insert this requirement to Rule Set 1 as there is no reason for the differentiation between these two on this issue.</i></li> <li>2. <i>For both Case A and B in Rule Set 2 the allowance to demonstrate that an energy storage asset attached to the relevant electricity production asset is providing a time-shifting service shall be included and account as relevant production from the asset.</i></li> <li>3. <i>Furthermore, the hourly time restriction shall be phase in through a 5-year transition period as these contracts are today not available nor commercially feasible.</i></li> </ol>				
<b>Proposed Change</b>	<p><i>For Rule Set 2 the following changes are recommended:</i></p> <ol style="list-style-type: none"> <li>1. <i>Additionality as a requirement to the asset(s) in question should not apply. There is no difference to the carbon footprint of a electricity producing asset depending on its age. GBA’s proposal would fex rule out most of renewable hydropower in the Nordic countries. This is not acceptable. It is FREYR Battery’s view that stimulus to building additional capacity of renewable energy will derive from the carbon accounting rules through the market drivers it will create and should not be part of accounting rules for carbon footprint. If GBA decides to insist on additionality for Rule Set 2 then it is FREYR Battery’s opinion that it must also insert this requirement to Rule Set 1 as there is no reason for the differentiation between these two on this issue.</i></li> <li>2. <i>For both Case A and B in Rule Set 2 the allowance to demonstrate that an energy storage asset attached to the relevant electricity production asset is providing a time-shifting service shall be included and account as relevant production from the asset.</i></li> <li>3. <i>Furthermore, the hourly time restriction shall be phase in through a 5-year transition period.</i></li> </ol>				
<b>GBA</b>					

## Greenhouse Gas Generic Rulebook Consultation Responses

---

Response
<p>The GBA considered excluding adding the same additionality criterion to Rule Set 1, removing the additionality requirement from both Rule Sets, and modifying Rule Set 2 to pertain to additional capacity (rather than assets).</p> <p>The most acceptable option for the group as a whole was to keep the additionality criterion unchanged. The purpose of each of the two Rule Sets is different and contrasting. The additionality criterion is intended to achieve a clean physical modelling, avoid displacement of carbon footprint to others, and minimise double counting within Rule Set 2.</p> <p>We have therefore kept unchanged the additionality criterion of Rule Set 2 in the GHG Rulebook.</p>

# Greenhouse Gas Generic Rulebook Consultation Responses

ID	56	Respondent Name	Patrick	Comment Link	<a href="#">View Comment</a>
Section	Rule Set 2: Physically Modelled Approach (PMA)				
Comment	<p>Case B / bullet point 2 is too complex and hard to understand (not to be too critical).</p> <p>The reasoning behind this criteria is that the energy producer must be in a situation in which it is possible to consider that the energy that it injects into the grid effectively (and not accidentally) contributes to feeding the energy using facility.</p> <p>For this, both entities should ideally be located in the same binding area (this concept is in the existing text), but an extension should be granted to expand to the full country (to not place countries that have multiple bidding areas at a disadvantage) and to the neighboring country (to not place small countries at a disadvantage), provided the two countries do have a physical interconnection between their grids (to exclude neighboring countries which are not interconnected).</p> <p>The sale 1,000,000 km<sup>2</sup> threshold could be inserted for case C</p>				
Proposed Change	<p>Case B:</p> <ul style="list-style-type: none"> <li>The contracted asset and the energy using facility shall be located in the same country or within an adjacent country with which there is a physical interconnection. For very large countries (&gt; 1,000,000 km<sup>2</sup>, ie Russia, Canada, China, Brazil and others) that have several bidding areas (or similar supply/demand matching areas), the contracted asset and the energy using facility shall be located in the same bidding area or within an adjacent bidding area with which there is a physical interconnection.</li> </ul>				
GBA Response	<p>We modified the text to read as follows:</p> <p>"The contracted asset and the energy using facility shall be located in the same country. If the contracted asset and the energy using facility are located in two different countries, they need to be located in adjacent bidding areas with a physical synchronous interconnection. For very large countries (e.g., 1,000,000 km<sup>2</sup>, i.e., Russia, Canada, China, Brazil and others) that have several bidding areas (or similar supply/demand matching areas), the contracted asset and the energy using facility shall be located in the same bidding area or within an adjacent bidding area with which there is a physical synchronous interconnection."</p>				



## Greenhouse Gas Generic Rulebook Consultation Responses

ID	57	Respondent Name	Patrick	Comment Link	<a href="#">View Comment</a>
Section	Rule Set 2: Physically Modelled Approach (PMA)				
Comment	<p>We would like to express support to the continued use of Rule set #2 (PMA).</p> <p>Contrary to what has been argued by several stakeholders, the issue at stake is NOT full avoidance of double counting of low CO2 attributes energy (although rule set 2 tends to undercount attribute tracking instruments rather than double-count them), but rather proper tracking of the actual GHG generation linked to the manufacture of a product.</p> <p>Essentially, the issue at stake is to be "approximatly right rather than precisely wrong".</p> <p>In the context of increased pressure to strengthen the credibility of the GHG protocol, several scientific studies have been published that estimate the actual CO2 reduction that can be attributed to the act of contracting a PPA with an low carbon electricity producer (meeting additionality criteria) for the full electricity consumption of a site (see McKinsey 2023).</p> <p>Moreover, several initiatives have taken shape and have collaborated to generated a full set of standards to properly ensure synchronicity between supply and consumption (see the granular certificate scheme standard by Energy Tag).</p> <p>Lastly, the RED III directive, as per the compromise reached in April, will be requiring that a GoO makes reference to the imbalance settlement period during which it was generated (which is a series of short time increments which cannot exceed 30 minutes), hence laying the groundwork for future synchronicity requirements.</p>				
Proposed Change	Keep scope 2 modelling approach unchanged.				
GBA Response	<p>In response to other comments received, we did amend Rule Set 2 in the following places:</p> <ul style="list-style-type: none"> <li>- Introductory paragraph explaining its underlying philosophy (see above)</li> <li>- Case B / bullet point 2 setting geographical criteria for claims of envirommental attributes</li> </ul>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

- Case B / bullet point 4 setting temporal criteria for claims of environmental attributes
- New text introducing a 3yr transition period to application of Case B

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	33	<b>Respondent Name</b>	FernandoAntonanzas	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Secondary data				
<b>Comment</b>	As per suggested modification in 3.3.2 a 5% instead of 3% will improve usability of this code with LCAs and EPDs done on a 5% threshold value.				
<b>Proposed Change</b>	Modify the 3% by 5% along this subsection.				
<b>GBA Response</b>	<p>The rationale for the cut-off limits in the GHG Rulebook, was to match as much as possible the latest thinking of the European Union for its Batteries Regulation whilst remaining practical.</p> <p>The World Business Council for Sustainable Development, Together for Sustainability (chemicals industry), the Catena-X project (automotive) and the GBA have now all agreed to recommend the cumulative 3% cut-off for material inputs/outputs, energy inputs/outputs and contribution to overall product carbon footprint.</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	21	Respondent Name	Adriell Phoe	Comment Link	<a href="#">View Comment</a>
<b>Section</b>	System expansion				
<b>Comment</b>	<p>1. ‘For metals, 10-year average global market prices, e.g., as published by the World Bank (The World Bank, 2022) shall be applied’ – <i>Is there an expectation to consider rolling 10-year average for the economic value calculation?</i></p> <p>2. System expansion – ‘The system expansion is done in a way that the by-product, which is used in other processes and therefore replacing another material, is credited with the carbon footprint of the replaced material. This can be, for instance, if sulphuric acid is produced as a by-product from sulphidic ore processing. This would replace sulphuric acid from the petroleum industry’ - <i>This is where system expansion can be questionable: It's not always clear what it replaces.</i></p>				
<b>Proposed Change</b>	<p>1. We would like to clarify GBA’s definition of ‘10-year average global market prices’. Is there an expectation to consider rolling 10-year average for the economic value calculation? If not, how often should this be updated? Also, how does GBA expect this to be applied where there isn’t a global market price for example in the case of illiquid products?</p> <p>2. We would require clarification on what the economic allocation between co-products entails, where the boundaries are set and what the logic is behind it.</p>				
<b>GBA Response</b>	<p>1. The primary data collection shall be done on an annual basis (either the most recent available calendar year or the most recent available financial year). The 10-year average global market price should be the most recently available annual update of 10-year average global market prices.</p> <p>2. The GHG Rulebook is provided to complement existing standards and methodologies on economic allocation between co-products. See Chapter 2 for reference to existing standards and methodologies. Because it is not always clear what a by-product replaces, the GHG Rulebook specifies that a well-characterised representative process must be present to allow implementation of system expansion.</p>				

# Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	47	<b>Respondent Name</b>	Achim Teuber	<b>Comment Link</b>	<a href="#">View Comment</a>			
<b>Section</b>	Thermal pre-treatment - pyrolysis Allocation							
<b>Comment</b>	Added graphite and electrolyte in the specification in the table under Direct GHG emissions							
<b>Proposed Change</b>	<p>Graphite and electrolyte, if thermally lost</p> <table border="1" data-bbox="336 558 1433 654"> <tr> <td>Direct GHG emissions</td> <td>kg</td> <td>Graphite and electrolyte, if thermally lost</td> </tr> </table>					Direct GHG emissions	kg	Graphite and electrolyte, if thermally lost
Direct GHG emissions	kg	Graphite and electrolyte, if thermally lost						
<b>GBA Response</b>	We have modified the text accordingly.							

## Greenhouse Gas Generic Rulebook Consultation Responses

ID	49	Respondent Name	Achim Teuber	Comment Link	<a href="#">View Comment</a>
Section	Thermal pre-treatment - pyrolysis Allocation				
Comment	We changed the allocation chapter as follows in the revision to Battery Pass version 1.1				
Proposed Change	<p>Mechanical pre-treatment separates battery materials into black mass and several other co-products. Typically, metal fractions are produced as co-products. <b>As a first step, it shall be assessed whether process subdivision can be applied at the points of separation for the respective co-products, in line with Chapter 3.4.1. As a second step, it shall be evaluated whether system expansion applies for eliminating co-products from the system boundary. Since</b> there is likely no well-characterised and representative alternative for metals, metal fraction co-products shall be allocated either economically or via mass, depending on the price differential. For other materials such as polymer flakes, graphite or electrolytes, these co-products may be given system expansion credits if the conditions of the allocation rules apply (particularly well-characterised and representative alternative routes, verification of economic value). If these alternative routes cannot be identified, economic or mass allocation applies. <b>When the price ratio between all process output products exceeds four, economic allocation shall be applied. This is likely the case but depends on the composition of the treated battery, which is why the user of the rulebook shall assess the applicability of economic allocation in line with the allocation requirements</b> (See Chapter 3.4.1).</p> <p>For modelling electricity, please refer to the Chapter 4.2.2.</p>				
GBA Response	<p>We have modified the text to include the following:            "Mechanical pre-treatment separates battery materials into black mass and several other co-products. Typically, metal fractions are produced as co-products. As a first step, it shall be assessed whether process subdivision can be applied at the points of separation for the respective co-products, in line with Chapter 4.1.1. As a second step, it shall be evaluated whether system expansion applies for eliminating co-products from the system boundary. Since there is likely no well-characterized and representative alternative for metals, metal fraction co-products shall be allocated either economically or via mass, depending on the price differential. For other materials such as polymer flakes, graphite or electrolytes, these co-products shall be given system expansion credits if the conditions of the allocation rules in Chapter 4.1 are met (particularly alternative well-characterized and representative routes, verification of economic value). If these alternative routes cannot be identified, economic or mass allocation applies (See Chapter 4.1.1). When the price ratio between all process output products exceeds four, economic allocation shall be applied. This is likely the case but depends on the</p>				

## Greenhouse Gas Generic Rulebook Consultation Responses

---

composition of the treated battery, which is why the user of this Rulebook shall assess the applicability of economic allocation in line with the allocation requirements (See Chapter 4.1.1)."

## Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	46	<b>Respondent Name</b>	Achim Teuber	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Thermal pre-treatment - pyrolysis Data collection requirements				
<b>Comment</b>	Added graphite (changes in bold)				
<b>Proposed Change</b>	<b>Where</b> electrolytes <b>and graphite</b> evaporate in the thermal pre-treatment, direct emissions <b>shall</b> be included.				
<b>GBA Response</b>	We have modified the text accordingly.				



## Greenhouse Gas Generic Rulebook Consultation Responses

ID	26	Respondent Name	Adriell Phoe	Comment Link	<a href="#">View Comment</a>
Section	Transportation				
Comment	<p>1. “The <b>first approach</b> requires the amount of consumed fuel, e.g., the diesel consumption of a company owned truck fleet in a mine. To calculate the GHG emissions, the diesel consumption is multiplied with the CF for the supply of the fuel (see chapter 4.2.1) and is multiplied with emission factors from e.g., the 2006 IPCC Guidelines for mobile combustion (IPCC, 2006).” – <i>In many instances, for calculations under the first approach the amount of consumed fuel may have to be estimated based on modelling (E.g., ship specifications and assumptions regarding conditions at sea).</i></p>				
Proposed Change	<p>1. Suggest adding an allowance for a hybrid approach, given in many instances for calculations made under the first approach, the amount of consumed fuel may have to be estimated based on modelling (E.g. ship specifications and assumptions regarding conditions at sea on specific route).</p>				
GBA Response	<p>The World Business Council for Sustainable Development, Together for Sustainability (chemicals industry), the Catena-X project (automotive) and the GBA have now all agreed to recommend use of the emission factors published by the GLEC Framework.</p> <p>The GLEC Framework provides guidance on how to implement ISO14083 (which supersedes BS EN 16258) and incorporates use of relevant IPCC, DEFRA, GREET model data as well as internationally recognised emission factors for other regions (e.g., Australia).</p> <p>The GLEC Framework v3, in line with ISO 14083, covers well-to-tank emissions plus tank-to-wake emissions.</p> <p>See Chapter 5.2.4</p>				

# Greenhouse Gas Generic Rulebook Consultation Responses

---

<b>ID</b>	37	<b>Respondent Name</b>	Ingo Steinke	<b>Comment Link</b>	<a href="#">View Comment</a>
<b>Section</b>	Verification/Review/Audit				
<b>Comment</b>	This section hasn't been sufficiently elaborated upon until now; it has mainly served as a placeholder. As a result, we're presenting our proposal here.				
<b>Proposed Change</b>	<p><b>Proposal for the content of the GBA's GHG Rulebook, Chapter 7:</b></p> <p>The focus of this conformity assessment procedure is on a verification of the LCA/PCF-study (ISO/IEC 14064-3, ISO 14065) and auditing of the quality assurance of the production process. The manufacturer must demonstrate that the requirements of Chapters 4, 5 and 6 are fulfilled. The manufacturer has to ensure that requirements are fulfilled on its own responsibilities.</p> <p><b>1. Requirements towards the manufacturer</b></p> <p><b>1.1 Quality system</b></p> <p>- Implementing certified quality system including processes to ensure the quality and traceability of information concerning PCFs</p> <p><b>1.2 Supply Chain</b></p> <p>- Selects appropriate suppliers and conducts regular supplier audits</p> <p>- Providing evidence and information of the suppliers corresponding to the calculation study</p> <p><b>1.3 Technical documentation</b></p> <p>- Prepare technical documentation and calculation study for LCA/PCF, if applicable:</p> <ul style="list-style-type: none"><li>• Product description</li><li>• Concept design, manufacturer drawings, BOM</li><li>• Marking</li></ul>				

- List of standards that are have been used for the PCA/LCA-study
- Documents of the calculation study
- List of technical specification
- Test reports

- Store technical documentation and corresponding information for at least 10 years

## **2 Requirements towards the conformity assessment body**

### **2.1 Accreditation**

- Accreditation of an IAF-accreditation-body

- Standards: ISO 17029, ISO 14065 as verification body, ISO 17021-1 as auditing body, ISO 17065 as certification body

- An accredited conformity assessment body shall be independent and therefore shall not have any business relationship regarding consultancy or development with the manufacturer

### **2.2 Personnel Requirements**

- A conformity assessment body should have sufficient personal resources to perform the assessment procedure

- The conformity assessment is taken by competent persons:

- Related academic degree or proven similar level of expertise gained in the field of LCA or PCF assessments
- At least 5 years professional experience in the respective fields of the assessment
- And related special expertise in the project role as “reviewer” or “verifier” according to ISO/IEC 14066 and PEF Guidelines or ILCD Handbook proven by project references
- Proven knowledge and expertise about relevant international codes and standards

## **3. Project process**

## **3.1 Pre-engagement, engagement and planning**

Both parties are

- Defining the project scope
- Identifying the concerned manufacturer locations
- Listing and exchanging the required information
- Estimating the project timeline
- Agreeing upon the applicable assessment procedure and the concerned resources
- Closing an NDA and a commercial project contract

## **3.2 Review of calculation study**

- Conformity assessment body is reviewing the received manufacturer information / technical documents, i.e.
  - Primary data
  - Selected GHG emission factors
  - Corresponding procedures for documentation and monitoring the parameters
- Checking overall data quality on validity, consistency, transparency
- Checking and discussing manufacturers provided LCA model
- Providing manufacturer with a report on findings, data inconsistencies and missing documentation

## **3.3 On-site audit**

Conformity assessment body is:

- Analyzing primary data quality
- Checking assumptions for product carbon footprint inventory and modelling, i.e.

- Raw material acquisition
- Recycled content calculation / documentation of recycled content from suppliers
- Manufacturing process
- Product use

- Providing manufacturer with an audit report on findings

### **3.4 If necessary: Improving PCF study**

Manufacturer is implementing corrections and submit missing documentation

Conformity assessment body is checking the implementations and the corrective actions for the findings

### **3.5 Statement is issued**

Conformity assessment body is:

- in case of LCA, stating that the LCA is in conformance with ISO 14040 and ISO 14044
- in case of PCF, confirming that the information provided on the CO2 emission are reliable via the verification statement

### **4. Surveillance / Re-Statement**

Conformity assessment body is:

- carrying out yearly audits to check actuality and reliability of data /methodology used to assess the LCA / PCF
- providing manufacturer with a report on findings, data inconsistencies and missing documentation if applicable
- checking the implementations and the corrective actions for the findings
- adjusting LCA / PCF statement

## Greenhouse Gas Generic Rulebook Consultation Responses

---

	Manufacturer is  - implementing corrections and submit missing documentation
<b>GBA Response</b>	We have modified Chapter 8 on Verification/Review to give some more general information about the GBA's current thinking and would welcome further suggestions in subsequent public consultations.

## Greenhouse Gas Generic Rulebook Consultation Responses

---

ID	15	Respondent Name	Nano One	Comment Link	<a href="#">View Comment</a>
Section	pCAM and CAM manufacturing				
Comment	<p><i>so far, only NMC has been analysed in detail: Considering the growing importance of LFP, the same level of detail as NMC should be provided</i></p> <p><i>Nickel sulfate</i></p> <p><i>Cobalt sulfate: As per previous comments, we recommend not to limit to sulfated metals</i></p>				
Proposed Change					
GBA Response	<p>We modified Chapter 6.2 on pCAM and CAM manufacturing to include the following:</p> <p>"The following pCAM and CAM manufacturing-specific chapter covers the production of precursor cathode active material (pCAM) and the final production of the cathode active material (CAM). Rules for production of pCAM and CAM from recycling are included in Chapter 6.5. This cluster covers all kinds of cathode chemistries used for LIB in the electric vehicle sector (e.g., NMC, LFP, NCA). Cluster-specific rules are defined below in addition to the generic rules defined in chapters 4 &amp; 5. As outlined in Chapter 5.3, the used CF for the supply of the following materials shall be supplier-specific:</p> <ul style="list-style-type: none"> <li>• Nickel sulfate or other</li> <li>• Cobalt sulfate or other</li> <li>• Lithium hydroxide</li> <li>• Lithium carbonate"</li> </ul>				

Report run at 11 Dec 2023 09:09:30. Total number of responses: 55