



ResponsibleSteel GHG Emissions Requirements for ‘Steel Certification’

Draft Version 2.1

23rd December 2021

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Once finalised, these additional requirements will be incorporated into the current ResponsibleSteel Standard Version 1-1 (this version includes changes that were approved as an urgent revision by the ResponsibleSteel Board in June 2021), which will then be re-issued as the ResponsibleStandard Version 2-0. The new requirements for GHG emissions will be added to the current Principle 8. We currently envisage that the new requirements for the responsible sourcing of input materials will be incorporated as a new Principle 3. In consequence the current Principles 3 to 12 will be renumbered 4 to 13, as shown below:



Once approved, the new ResponsibleStandard Version 2-0 will be the basis for both ‘site certification’ and ‘steel certification’. Sites that meet the existing requirements will continue to be eligible to make use of the ResponsibleSteel ‘certified site’ logo as at present. Sites that meet the additional requirements specified in the new Principle 3: Responsible Sourcing of Input Materials, together with the additional requirements specified in the renumbered Principle 9: Climate Change and GHG Emissions, will be able to sell their steel to customers as ResponsibleSteel certified steel using the ResponsibleSteel ‘certified steel’ logo.

On the basis of the current draft requirements we expect to define three performance levels in relation to GHG emissions – currently referred to in draft as ‘level 1’, ‘level 2’ and ‘level 3’. These performance levels are designed to allow downstream users and specifiers to distinguish between products depending on the GHG emissions intensity of the crude steel from which they are produced, and we expect them to be supported by different versions of the ResponsibleSteel ‘certified steel’ logo, currently under development.

Once the requirements for ‘steel certification’ are completed, ResponsibleSteel will focus on developing the requirements to include downstream supply chains in the ResponsibleSteel certification programme through the development of a downstream ‘chain of custody’ standard.

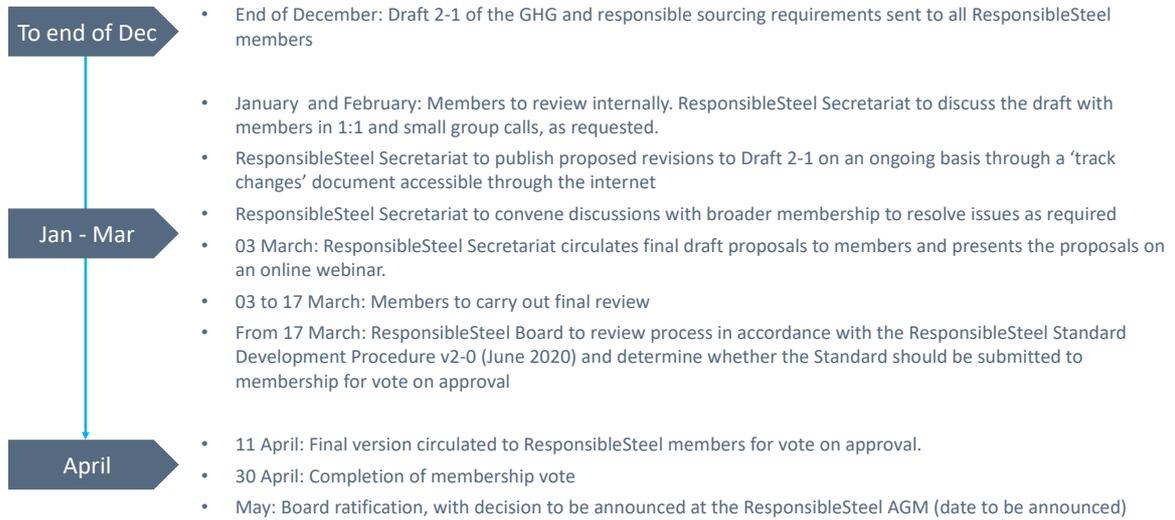
Finalisation of this document

This document presents revised draft versions of the additional requirements for the greenhouse gas (GHG) emissions. The draft requirements are based on the previous draft 2.0 which was published on 19 April 2021 for a 60-day public stakeholder consultation. This revised draft 2.1 takes account of the comments submitted during the public consultation, as well as the discussions that have taken place with ResponsibleSteel members subsequently. The comments from the public consultation, minutes of subsequent meetings to discuss the draft, and supporting documentation from the meetings are available on the ‘Resources’ page of the ResponsibleSteel website under the heading [GHG Standard Development Resources](#).

This document has been prepared by the ResponsibleSteel Secretariat based on discussions with ResponsibleSteel board, members and stakeholders over the last months and years. Approval of the

requirements will be sought from the ResponsibleSteel Board and membership once the requirements have been finalised.

The following graph summarises our anticipated timeline for finalising the responsible sourcing and GHG emissions requirements:



If you have any questions or comments on the proposed process or timeline, please contact

For responsible sourcing:

Marnie Bammert
 Technical and Assurance Director
mbammert@responsiblesteel.org

For GHG emissions:

Matthew Wenban-Smith
 Policy and Standards Director
mwenbansmith@responsiblesteel.org

DRAFT Principle

Principle 8. Climate Change and Greenhouse Gas Emissions

Drafting Notes

This section takes the text circulated in Draft 2-0, April 2021 as the base text, and highlights further changes using 'track changes'.

Objective:

The corporate owners of ResponsibleSteel certified sites are committed to the global goals of the Paris Agreement, and both certified sites and their corporate owners are taking the actions needed to demonstrate this commitment.

The objective of the additional criteria required for the ResponsibleSteel certification of products produced at the site is to provide the basis for downstream users and specifiers of steel, policy makers and other stakeholders to support steelmakers in their efforts to reduce GHG emissions in the steel supply chain through the use of product specifications, purchasing commitments, financing and investment decisions, policies or other actions based on the recognition of ResponsibleSteel certified products.

Background:

The United Nations refers to climate change caused by man-made emissions of greenhouse gases as the defining issue of our time, and its Sustainable Development Goal 13 urges countries to take urgent action to combat climate change and its impacts.

Tackling climate change requires an unprecedented effort from all sectors of society. The steel industry, responsible for between 7% and 9% of direct greenhouse gas emissions from the global use of fossil fuel¹, has a critical role and responsibility both in relation to the reduction of emissions associated with steelmaking, and in the supply of the materials that will be needed to achieve the transition to a zero carbon economy.

The ResponsibleSteel standard's requirements are written to support the Paris Agreement of the parties to the United Nations Framework Convention on Climate Change, which recognises the need for an effective and progressive response to the urgent threat of climate change on the basis of the best available scientific knowledge, and aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

- a. Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognising that this would significantly reduce the risks and impacts of climate change
- b. Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production;

¹ Steel's contribution to a low carbon future and climate resilient societies - worldsteel position paper © World Steel Association 2019 ISBN 978-2-930069-83-8

and

- c. Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

The standard requires that companies that wish to benefit from ResponsibleSteel certification of their sites must be able to demonstrate, at the corporate owner level, that they are committed to the goals of the Paris Agreement. The standard recognises that the public policy environment is critically important to steelmakers’ ability to implement change, and requires that companies identify and then engage to achieve the necessary policy changes. In line with the agreement’s reference to financial flows and climate-resilient development, the standard requires that such companies implement the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD).

At the site level, the standard requires that greenhouse gas emissions are measured, reported and disclosed, and that site-level targets for greenhouse gas emissions have been developed and are in line with corporate owner level goals.

For the ResponsibleSteel certification of steel the standard requires, in addition, that the GHG emissions intensity for production of the crude steel has been determined and is publicly reported in accordance with internationally consistent GHG accounting rules. It thereby provides for the first time a basis for the GHG emissions for the production of steel from different sites around the world to be compared fairly, consistently and on a like-for-like basis, irrespective of site configuration, steelmaking technology, or choices of input materials.

Finally, the standard requires that any ResponsibleSteel certified product (or co-product or by-product of steel making) must be accompanied with a declaration of its embodied carbon. This allows for downstream users to track the embodied carbon associated with their use of steel products.

Criterion	Summary of Requirements	Must be met for ‘site certification’	Must be met for ‘steel certification’
8.1	• The corporate owner has published a science based decarbonisation target for the company, aligned with the achievement of the goals of the Paris Agreement	✓	✓
8.2	• The corporate owner is implementing the recommendations of the Taskforce for Climate-Related Financial Disclosures (TCFD)	✓	✓
8.3	• Site level GHG emissions are measured using a recognised international or regional standard	✓	✓
8.4	• Site level GHG emissions are measured from ‘mine to metal’ using ResponsibleSteel’s internationally consistent GHG accounting rules		✓
8.5	• GHG emissions reduction targets and planning aligned with the achievement of the goals of the Paris Agreement are in place and being implemented at the site level	✓	✓
8.6	• Site level GHG emissions intensity threshold achieved • GHG emissions intensity performance level 1, 2 or 3 determined, tracking site level progress towards ‘near zero’ GHG emissions • Product level carbon footprint determined using a recognised international or regional standard		✓
8.7	• Key site level information published on the ResponsibleSteel website, including: • Site level* GHG emissions data and decarbonisation target • Site level* GHG emissions intensity performance data and performance level • Product level carbon footprint data available to customers	Site level emissions & reduction targets only	✓

Figure 1. Summary of Principle 8 Requirements

These key aspects of the standard are summarised in Figure 1. Taken together they are designed to provide an effective basis to drive and reward GHG emissions reduction across the whole sector:

- The recognition of forward-looking company and site level commitments supports steelmakers in making the transition to new, low carbon emission technologies, recognising that there will be a delay of many years between corporate commitment, investment, and the production of low embodied

carbon steel, and in the long term net zero embodied carbon, steel;

- The determination and public disclosure of the GHG emissions intensity for crude steel production, distinguishing between distinct, objectively determined performance levels, allows customers and other stakeholders to identify and reward steelmakers that have made the necessary operational and capital investments to reduce their GHG emissions. The ResponsibleSteel crude steel GHG emissions intensity performance measure provides a fair basis for comparison between sites irrespective of the technologies used, including emissions from ‘cradle to crude steel’, and undistorted by differences in a site’s use of scrap as an input material or differences in the nature of processing that takes place after the crude steel has been made. Separate thresholds are specified for stainless steel and high alloy steel products so that these products that have inherently higher GHG emissions intensities can be compared fairly, both with each other, and when compared to the production of carbon steel.
- The additional requirement to provide product carbon footprint for all ResponsibleSteel certified steel products, co-products or by-products allows customers to track their own use of embodied carbon in the materials they use, as well as providing the essential information for them to perform effective life-cycle analyses of their own products and services, whether those are consumer goods, buildings, cars, infrastructure or energy projects. Sites making products that have higher GHG emissions resulting from the use of alloys or coatings can thereby provide additional information that takes account of the full life cycle emissions of those products, allowing them to be compared fairly with competing products that may have lower absolute levels of embodied carbon, but which have shorter lives in use or which may be less readily recycled.

Criterion 8.1: Corporate commitment to achieve the goals of the Paris Agreement

Drafting Notes

This section includes changes to the wording of the current ResponsibleSteel Standard (v1-0) criterion 8.1 as proposed in Draft 2-0 published in April 2021, and subsequently agreed in principle in discussion with ResponsibleSteel members. Areas corresponding to these changes are highlighted in **yellow**.

Revisions to the Criteria that relate only to site certification (C8.1, C8.2, C8.3 & C8.5) that were not already raised in the April 2021 draft or as a result of the urgent revision of June 2021 will not be considered during the current revision process, unless these are strictly necessary to ensure compatibility with the new requirements for 'steel certification'. Changes to C8.1, C8.2, C8.3 & C8.5 may be made over the coming months, if required, through the existing procedures for clarifications, interpretations and/or urgent revisions, as defined in sections 9 to 11 of the ResponsibleSteel Standard Development Procedures (Version 2-0, 18 June 2020). A full review of the requirements of the ResponsibleSteel Standard V1-0 was scheduled to take place three years after its approval in November 2019. ResponsibleSteel expects to initiate that process once the current process to define requirements for the ResponsibleSteel certification of steel have been completed.

Criterion 8.1: Corporate commitment to achieve the goals of the Paris Agreement

The site's corporate owner has defined and is implementing a long- and medium-term strategy to reduce its greenhouse gas (GHG) emissions to levels that are compatible with the achievement of the goals of the Paris Agreement, with an aspiration to achieve net-zero GHG emissions through work with policy makers and others.

8.1.1. The site's corporate owner ascribes publicly to a credible, long-term emissions reduction pathway for the steel industry as a whole that is compatible with the achievement of the goals of the Paris Agreement, and which includes:

- a. Explicit projections of long-term steel consumption;
- b. Explicit projections for the production and use of primary as well as recycled steel, and the associated GHG emissions; and
- c. Explicit assumptions in relation to the public policy and other key conditions on which it is based.

8.1.2. The site's corporate owner has defined and made public both a long-term emissions reduction pathway and a medium-term, quantitative, science-based GHG emissions target or set of targets for the corporation as a whole. The corporation's emissions reduction pathway and medium-term target(s) are compatible with the long-term emissions reduction pathway it ascribes to for the steel industry, and the projections for the production of primary as well as recycled steel as applicable to its own portfolio of sites.

8.1.3. The site's corporate owner has a credible, documented strategy for the achievement of its corporate level GHG emissions target(s), outlining the timeline for change across its portfolio of sites and identifying the conditions that would need to be in place for the successful implementation of the strategy, and the specific actions, including policy engagement, it is committed to take to help bring these conditions about.

8.1.4 The corporate owner reviews the implementation of its strategy on a regular basis, documents the findings of the review, and updates the strategy to take account of the review's findings.

8.1.5 The review shows that the corporate owner is implementing its strategy effectively over time.

Guidance:

(8.1.1) An emissions reduction pathway for the steel industry that is compatible with the goals of the Paris Agreement is one which limits the global average temperature to well below 2°C above pre-industrial levels and supports efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

(8.1.1) Long-term in this context means a time horizon of 15 to 35 years.

(8.1.2) Medium-term in this context means a time horizon between 5 and 15 years from the present time.

(8.1.1, 8.1.2) Medium- or long-term refers to the time measured from the start of the relevant implementation period. For example, a ten-year (medium-term) target set seven years ago is still valid even if it has only three years still to run. However, if a medium-term target expires during the period of validity of a certificate, this would create a non-conformity with the requirement of the standard unless it is replaced by an updated medium-term target.

(8.1.2) A technically justified and publicly accessible 2050 net zero emissions target supported by a medium- and long-term transition pathway for the company would be sufficient to meet the requirements of 8.1.2. A science-based target (SBT) validated by the SBTi (Science Based Targets initiative) would be sufficient to meet the medium-term requirements of 8.1.2. Other quantitative, scientifically justified targets (or sets of targets, for example for separate processes) may also be recognised, as long as the ambition, quality and coverage of the target is comparable.

(8.1.3) Specific actions may also include investments at the corporate or site levels, building of pilot facilities to develop, test and scale up new technologies, proposition to seek funding through 'green bonds', general commitments to upgrade sites over a period of time, etc.

Criterion 8.2 Corporate Climate-Related Financial Disclosure

Drafting Notes

No changes have been proposed to the current ResponsibleSteel Standard (v1-0) criterion 8.2.

Revisions to the Criteria that relate only to site certification (C8.1, C8.2, C8.3 & C8.5) that were not already raised in the April 2021 draft or as a result of the urgent revision of June 2021 will not be considered during the current revision process, unless these are strictly necessary to ensure compatibility with the new requirements for 'steel certification'. Changes to C8.1, C8.2, C8.3 & C8.5 may be made over the coming months, if required, through the existing procedures for clarifications, interpretations and/or urgent revisions, as defined in sections 9 to 11 of the ResponsibleSteel Standard Development Procedures (Version 2-0, 18 June 2020). A full review of the requirements of the ResponsibleSteel Standard V1-0 was scheduled to take place three years after its approval in November 2019. ResponsibleSteel expects to initiate that process once the current process to define requirements for the ResponsibleSteel certification of steel have been completed.

Criterion 8.2: Corporate Climate-Related Financial Disclosure

The site's corporate owner is implementing the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD).

8.2.1. The site's corporate owner has allocated responsibility for oversight of climate-related risk and opportunity to at least one board committee, with an understanding that material climate-related risks and opportunities that impact business strategy will need to be discussed at the full board level.

8.2.2. The site's corporate owner has a documented commitment in place to implement the core recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) according to its four pillars - Governance, Strategy, Risk Management, and Metrics and Targets - in accordance with applicable TCFD guidance, within three years of the date of application for the site's certification.

Guidance:

Task Force on Climate-Related Financial Disclosures (TCFD): Final Report: Recommendations of the Task Force on Climate-Related Financial Disclosures, June 2017.

TCFD guidance: Implementing the Recommendations of the Task Force on Climate-Related Financial Disclosures, June 2017.

Implementation in accordance with applicable TCFD guidance requires that the corporate owner makes the recommended disclosures associated with the four core recommendations.

The ResponsibleSteel period of certification is three years. Sites owned by corporations which have not implemented the TCFD recommendations within three years of the date on which their first site applied for certification would not be issued with any further certificates. The failure would also jeopardise the maintenance of any other current site certifications of the corporate owner.

Criterion 8.3 Determination of GHG emissions for the purpose of site level GHG emissions reduction targets and planning only

Drafting Notes

This section includes changes to the wording of the current ResponsibleSteel Standard (v1-0) criterion 8.3 as proposed in Draft 2-0 published in April 2021, and subsequently agreed in principle in discussion with ResponsibleSteel members. Areas corresponding to these changes are highlighted in **yellow**.

Revisions to the Criteria that relate only to site certification (C8.1, C8.2, C8.3 & C8.5) that were not already raised in the April 2021 draft or as a result of the urgent revision of June 2021 will not be considered during the current revision process, unless these are strictly necessary to ensure compatibility with the new requirements for 'steel certification'. Changes to C8.1, C8.2, C8.3 & C8.5 may be made over the coming months, if required, through the existing procedures for clarifications, interpretations and/or urgent revisions, as defined in sections 9 to 11 of the ResponsibleSteel Standard Development Procedures (Version 2-0, 18 June 2020). A full review of the requirements of the ResponsibleSteel Standard V1-0 was scheduled to take place three years after its approval in November 2019. ResponsibleSteel expects to initiate that process once the current process to define requirements for the ResponsibleSteel certification of steel have been completed.

Criterion 8.3: Determination of GHG emissions for the purpose of site level GHG emissions reduction targets and planning only

The site measures and records key aspects of its GHG emissions in accordance with a recognised international or regional standard.

8.3.1. There is a system in place to estimate the total GHG emissions (CO₂ e) associated with materials imported to the site from outside the site boundary.

8.3.2. There is a system in place to estimate the total GHG emissions (CO₂ e) associated with the generation of electricity, heat and steam imported to the site from outside the site boundary.

8.3.3. The total direct GHG (CO₂ e) or CO₂ emissions for the site are measured, recorded and verified in accordance with the requirements of an applicable, recognised international and/or regional standard.

8.3.4. For sites that produce crude steel, the GHG emissions intensity for the crude steel produced (metric tonnes of CO₂ e/ metric tonne crude steel) is calculated in accordance with the requirements of an applicable, recognised international and/or regional standard.

Guidance:

(8.3.1) The system to assess upstream emissions should include a screening of imported materials to identify those that may be associated with significant GHG emissions such as mined materials or hydrogen where relevant.

(8.3.1) The site must provide an explanation of the basis for the calculation, including a listing of the input materials that have been included and excluded from the calculation, and the use of primary data, emission factors or other secondary data where used.

(8.3.1) As a minimum, the site must consider the GHG emissions associated with the materials listed in ISO 14404-1:2013 Table 2 and other materials that may be associated with significant GHG emissions. A material's GHG emissions are not considered to be significant if there is evidence that they are likely to constitute less than 5% of the total GHG emissions associated with all of the materials imported to the site

from outside the site boundary.

(8.3.1) The estimate may make use of emission factors such as those referenced in ISO14404 or from other secondary sources where no other reliable data are available. Where such secondary data or emission factors are used, these data must be referenced in the public report specified in 8.5.1 below. More resources should be committed to estimating the more significant sources of emissions, for example through the collection of emissions data from suppliers.

(8.3.1 & 8.3.3) In cases where **direct reduced iron (DRI), granulated pig iron (GPI), hot briquetted iron (HBI)**, pig iron or steel (other than scrap metal itself) is imported to the site from upstream sites, the associated GHG emissions must be accounted for using primary data specific to the input material's site of production and must not be based on generic or secondary sources of data. The site must ensure that GHG emissions associated with imported iron or steel are clearly and explicitly included in the calculations of GHG emissions and are included in the calculation of GHG emissions intensity in 8.3.4.

(8.3.3) ResponsibleSteel currently recognises the following international or regional standards:

- The GHG Protocol and EN 19694 (parts as applicable) for measurement of GHG emissions by steelmaking and other sites.
- ISO 14404 (parts as applicable) for the measurement of CO₂ emissions by steelmaking sites, as applicable.

Criterion 8.4 Determination of GHG emissions for the purpose of site level GHG emissions intensity performance comparison

Drafting Notes

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Note: Conformity with the requirements of Criterion 8.4 is mandatory for sites that wish to market or sell ResponsibleSteel certified products (referred to as ‘steel certification’). Conformity is voluntary for sites that do not wish to do this, and that only wish to claim that the site meets ResponsibleSteel requirements for the site only (‘site certification’).

Sites that plan to achieve ‘steel certification’ in the future are recommended to align their systems for the determination and reporting of GHG emissions with the requirements of this Criterion as soon as possible.

Criterion 8.4. Determination of GHG emissions for the purpose of site level GHG emissions intensity performance comparisons

In order to market or sell its steel or other products as ResponsibleSteel certified the site measures and records key aspects of its GHG emissions in accordance with the specifications of this Criterion, in addition to the requirements of Criterion 8.3.

Guidance:

The requirements of Criterion 8.4 differs in some respects from the requirements of other regional or international standards recognised by ResponsibleSteel in relation to Criterion 8.3. Where definitions or requirements specified in this Criterion conflict with the specifications of other international or regional standards adopted by the site, the definitions or requirements specified in this Criterion take precedence for the purposes of calculating the GHG emissions intensity for products that are to be marketed or sold as ResponsibleSteel certified (see Criterion 8.6 and Criterion 8.7).

Where companies or sites report GHG emissions results determined using different methodologies they should provide an accompanying explanation for any resulting differences in the reported figures.

8.4.1 GHG emissions data – general requirements.

a. The data for the determination of the site level GHG emissions intensity for crude steel production as specified in this Criterion 8.4 have been independently verified in accordance with the requirements of *ISO 14064-3:2019, Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements, to either the ‘reasonable level of assurance’ or the ‘limited level of assurance’*.

b. The determination of GHG emissions includes consideration of the emissions of carbon dioxide (CO₂), methane (CH₄), nitrogen trifluoride (NF₃), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆), using Global Warming Potential (GWP) values relative to CO₂ (CO₂e) with a 100-year time horizon as published by the IPCC.

c. The unit of measurement for GHG emissions is tonnes CO₂ equivalent (CO₂ e).

d. When external data sources (such as energy supply emission factors, or GHG emissions data provided by a supplier) are used, the source of the data is documented and available to auditors for inspection, and

includes:

- The time period to which the data apply
- The international standard, if applicable, used for the determination of the data
- Whether the data comprise:
 - Supply specific data (representing emissions for the production of a specific material from a specific facility of the producer, or calculated as a weighted average of emissions from specific facilities)
 - Producer average data (representing emissions for the production of a specific material averaged across multiple facilities managed by the producer without consideration of the relative quantities of material from specific facilities)
 - Industry average data (representing emissions for the production of a specific material averaged across multiple facilities managed by multiple producers)
 - ‘Indicative’ emission factors, as for example published in ISO 14404-1:2013, ISO 14404-2:2013, or ISO 14404-3:2017 for estimation of the direct (Scope 1) emissions for the site.
- Whether the data used included consideration of upstream indirect (Scope 3a) GHG emissions, energy indirect (Scope 2) GHG emissions, and/or direct (Scope 1) GHG emissions
- Whether the data included consideration of any offsets.

Guidance:

(8.4.1.a) *ISO 14064-3:2019 Greenhouse gases – Part 3: Specification with guidance for the verification and validation of greenhouse gas statements* defines two possible levels of assurance: verification at a ‘reasonable level of assurance’, and verification at a ‘limited level of assurance’. Verification should preferably be provided at the reasonable level of assurance, but must be provided at least at the ‘limited level of assurance’ as defined in ISO 14064-3 (2019). Under R8.7.1 the site is required to report the level of assurance provided.

8.4.2 Scope boundaries

8.4.2.a The scope boundary for the determination of the total GHG emissions for the site includes:

- Upstream indirect (Scope 3a) GHG emissions (see 8.4.3), including GHG emissions associated with:
 - Raw material extraction
 - Raw material preparation
 - Transportation
- Energy indirect (Scope 2) GHG emissions (see 8.4.4)
- Direct (Scope 1) GHG emissions (see 8.4.5)

8.4.2.b (Only applicable to sites where crude steel is produced). The end point of the scope boundary for the determination of the total GHG emissions for the production of crude steel, and therefore for the determination of the ResponsibleSteel crude steel GHG emissions intensity performance, is limited to

those emissions associated with the production of crude steel. GHG emissions associated with further processing of the crude steel after casting (for example, hot rolling, cold rolling, coating) and including the upstream indirect (Scope 3a), energy indirect (Scope 2), and direct (Scope 1) emissions for these processes, are not included for this purpose.

8.4.2.c The scope boundary for the determination of the product carbon footprint for steel products, co-products and by-products exported from the site is defined in accordance with the applicable international or regional standard(s) used (see 8.4.7 and 8.6.3).

Guidance:

Additional definitions to be included in Glossary:

Direct (Scope 1) GHG emissions: GHG emissions that result from sources within the site boundary.

Note 1. A GHG source is any physical unit or process that releases GHG into the atmosphere

Note 2. Direct (Scope 1) GHG emissions can include the CO₂ emissions from fuel consumption.

(Adapted from Scope 1 definition for an organisation, applied to the site. From GRI Standards, GRI 305: Emissions. Global Sustainability Standards Board, 2016).

Energy indirect (Scope 2) GHG emissions: GHG emissions that result from the generation of or purchased or acquired electricity, heating, cooling and steam consumed by the site (Adapted from Scope 2 definition for an organisation, applied to the site. Source GRI Standards, GRI 305: Emissions. Global Sustainability Standards Board, 2016).

Upstream indirect (Scope 3a) GHG emissions: Other indirect (Scope 3) GHG emissions that occur outside of the site boundary and upstream of its activities.

Downstream indirect (Scope 3b) GHG emissions: Other indirect (Scope 3) GHG emissions that occur outside of the site boundary and downstream of its activities.

(8.4.2.a) Downstream indirect (Scope 3b) GHG emissions outside the site boundary do not need to be considered, with the exception of emissions associated with the disposal of waste (see 8.4.6.h).

NOTE: the end point of the scope boundary for the determination of the carbon footprint of product for steel products, co-products and by-products exported from the site may be different to the end point of the scope boundary for the determination of the site's ResponsibleSteel crude steel GHG emissions intensity performance. GHG emissions associated with the further processing of crude steel after first casting do not affect the site's ResponsibleSteel crude steel GHG emissions intensity performance, but should be accounted for and recognised in the determination of the carbon footprint of product, as disclosed in the applicable environmental product declaration.

8.4.3 Upstream indirect (Scope 3a) GHG emissions

The system to estimate the upstream indirect (Scope 3a) GHG emissions of the site meets the following requirements:

a. The determination of the upstream indirect (Scope 3a) GHG emissions of the site includes consideration of the upstream indirect (Scope 3a), energy indirect (Scope 2), and direct (Scope 1) emissions associated with the extraction, processing and transportation of the following input materials:

- Ferrous raw materials: concentrate, direct reduced iron (DRI), granulated pig iron (GPI), hot briquetted iron (HBI), lump ore, pellets, pig iron, sinter, scrap, fines, revert
- Anthracite, charcoal, coke, coking coals, pulverised coal for injection
- Lime, dolomitic lime, dolomite, limestone
- Industrial and fuel gases: natural gas, hydrogen, oxygen
- Ferro-alloys: Cr, Mn, Mo, Ni, Nb, V, Al, B, Co, Mg, P, Si, Ti, W
- Non-ferrous metals: Al, Mg, Sn, Zn

b. The determination of GHG emissions conforms with the guidance provided for specific input materials (see guidance notes and the summary table below).

c. The determination of upstream indirect (Scope 3a) GHG emissions is exclusive of any offsets claimed by upstream suppliers.

d. Data are the most specific available, with source specific data used in preference to producer average data. When neither source specific nor producer average data are available the current ResponsibleSteel default emissions factors for upstream indirect (Scope 3a) GHG emissions of input materials must be used (see Guidance).

e. The site's upstream indirect (Scope 3a) emissions may be reduced pro rata if imported materials whose GHG emissions have been accounted for are subsequently exported from the site.

Guidance (and see summary table below):

(8.4.3.a) Emissions associated with blast furnace and slag additives, chemicals, desulfurizing products, electrodes, lubricants, oils, refractories, rolls do not need to be considered for the purpose of ResponsibleSteel certification.

(8.4.3.b):

Source- and producer-specific average embodied GHG emissions factors (note 1 in table)

Source-specific or producer-specific average GHG data should be determined in conformity with the requirements of ISO 14040 & ISO 14044. In all cases the site shall require the supplier to provide it with the source of the GHG data provided, any standard(s) which were followed for the calculation of the data, and the time period over which data used for the determination were collected (see 8.4.1.b).

Where source-specific or producer-specific average embodied GHG emissions factors are used they must include consideration of the Scope 1, Scope 2 and upstream Scope 3 GHG emissions for production of the input material concerned. Determination of Scope 2 GHG emissions shall be in accordance with the requirements specified in 8.4.4, below.

ResponsibleSteel default emissions factors for upstream indirect (Scope 3a) GHG emissions of input materials (note 2 in table)

ResponsibleSteel will publish default emissions factors for upstream indirect (Scope 3a) GHG emissions for each of the input materials that must be included in the determination of the upstream indirect (Scope 3a) GHG emissions for the site. These default emissions factors will be based on the estimated top decile figure for GHG emissions for the extraction and processing of the applicable material. Where possible embodied

GHG emissions factors will be developed for different sub-categories of material (e.g., separate embodied GHG emissions factors may be provided for grey, blue and green hydrogen).

Ferrous raw materials (note 3 in table)

Direct reduced iron (DRI), Granulated Pig Iron (GPI), Hot Briquetted Iron (HBI) and pig iron used as input material must be ResponsibleSteel certified. This ensures that the management of social and environmental impacts for iron- and steelmaking meet ResponsibleSteel requirements, irrespective of whether these input materials are produced within or outside the site boundary for crude steel production itself. Source-specific or producer-specific embodied GHG emissions data for these materials will therefore be available, in conformity with the ResponsibleSteel requirements as specified in Principle 8.

Scrap (note 4 in table)

All scrap is assigned an embodied GHG emissions factor of zero. The GHG emissions associated with transportation of the scrap from the commercial scrap collection point to the ResponsibleSteel certified site gate must however be estimated.

Charcoal (note 5 in table)

Charcoal is assigned a default embodied GHG emissions factor of zero. On this basis it is treated favourably compared to coal or natural gas as a source of energy for the reduction of iron ore. This default value does not consider the GHG emissions associated with the production of charcoal, nor the potential for net carbon dioxide sequestration from the atmosphere during biological growth. Charcoal may be assigned a negative source-specific GHG emissions factor that takes into account carbon dioxide sequestration during growth only when both of the following conditions are met: 1) the wood for the production of the charcoal is certified as being sourced from a forest or plantation which is certified as meeting the international standards of the Forest Stewardship Council (FSC) (or equivalent); and 2) the net carbon sequestration for the forest or plantation of origin has been independently verified through a credible programme.

The GHG emissions associated with transportation of the charcoal from the site of its production to the ResponsibleSteel certified site gate must be estimated.

	ResponsibleSteel certified product required as input material ¹ ?	Source-specific or producer-specific input material embodied GHG emissions factor required ¹ ?	ResponsibleSteel default input material embodied GHG emissions factor permitted ² ?	Supply-specific transportation data estimate required?
Ferrous raw material				
• Concentrate	no	no	✓	✓
• Direct reduced iron (DRI)	✓ ³	✓	no	✓
• Fines	no	no	✓	✓
• Granulated pig Iron (GPI)	✓ ³	✓	no	✓
• Hot briquetted iron (HBI)	✓ ³	✓	no	✓
• Lump ore	no	no	✓	✓
• Pellets	no	no	✓	✓

• Pig iron	✓ ³	✓	no	✓
• Sinter	no	no	✓	✓
Scrap				
• Scrap	no	no	Rated as zero tonnes CO ₂ e/tonne) ⁴	✓
Ferro alloys				
• Cr, Mn, Mo, Ni, Nb, V, Al, B, Co, Mg, P, Si, Ti, W	no	no	✓	no
Non-ferrous metals				
• Al, Mg, Sn, Zn	no	no	✓	no
Process coal, coke and charcoal				
• Anthracite	no	no	✓	✓
• Charcoal	no	no ⁵	Rated as zero tonnes CO ₂ e/tonne) ⁵	✓
• Coke	no	no	✓	✓
• Coking coals	no	no	✓	✓
• Pulverised coal for injection	no	no	✓	✓
Lime, dolomitic lime, dolomite, limestone				
• Lime,	no	no	✓	✓
• Dolomitic lime	no	no	✓	✓
• Dolomite	no	no	✓	✓
• Limestone	no	no	✓	✓
Industrial and fuel gases				
• Argon	no	no	✓	✓
• Hydrogen	no	no	✓	✓
• Oxygen	no	no	✓	✓
• Natural gas	no	no	✓	✓
• Nitrogen	no	no	✓	✓
Other input materials for steelmaking	Emissions associated with blast furnace and slag additives, chemicals, desulfurizing products, electrodes, lubricants, oils, refractories, rolls do not need to be considered for the purpose of ResponsibleSteel certification.			

8.4.3.h Summary Table

8.4.4 Energy indirect (Scope 2) GHG emissions

Energy indirect (Scope 2) GHG emissions are determined in accordance with the following specifications:

a. Imported electricity

- GHG emissions for imported electricity are quantified in accordance with the requirements of ISO 14064-1:2018 Annex E.2 Treatment of imported electricity, using the emission factor that best

<p>characterises the pertinent grid, i.e. dedicated transmission line, local, regional or national grid-average emission factor.</p> <ul style="list-style-type: none"> • Grid-average emission factors should be from the emissions year being reported, if available, or the most recent year if not. Grid-average emissions factors for imported consumed electricity shall be based on the average consumption mix of the grid from which the electricity is consumed. • GHG emission reductions based on renewable energy certificates, power purchase agreements, virtual power purchase agreements, or green tariffs paid in relation to the site's sourcing of electricity are permitted where these meet the requirements of ISO 14064-1:2018 E.2.2 Additional information. • GHG reductions achieved through the use of biofuels that do not meet recognised sustainability standards shall not be recognised as contributing to the achievement of the net GHG reduction targets associated with the use of imported electricity. <p>b. heating, cooling and steam</p> <ul style="list-style-type: none"> • GHG emissions for imported energy other than electricity are quantified using a source-specific emission factor. • Emission factors should be from the emissions year being reported, if available, or the most recent year if not. Average emissions factors for imported energy shall be based on the average consumption mix of the energy generator.
<p>Guidance:</p> <p>(8.4.4.a) Recognised sustainability standards for biofuels are currently limited to the voluntary schemes recognised as meeting the sustainability criteria of the European Union’s Renewable Energy Directive (EU) 2018/2001 (see list of approved Voluntary Schemes).</p>
<p>8.4.5 Direct (Scope 1) GHG emissions</p> <p>The direct (Scope 1) GHG emissions for the site are measured, recorded and verified in accordance with the requirements of an applicable, recognised international and/or regional standard and in accordance with the requirements of Criterion 8.4.6 for the determination of the ResponsibleSteel crude steel GHG emissions intensity performance for the site, and in accordance with the requirements of Criterion 8.4.7 for the determination of the allocation of the site’s total GHG emissions to products, co-products and by-products.</p>
<p>Guidance:</p> <p>(8.4.5) The requirements of Criteria 8.4.6 and 8.4.7 will differ in some respects from those of the regional or international standard adopted by the site for other purposes. In all cases, the requirements of Criterion 8.4.6 or 8.4.7 as applicable take precedence, for the purpose of determining the ResponsibleSteel crude steel GHG emissions intensity performance for the site, and for the purpose of determining the allocation of the site’s total GHG emissions to products, co-products and by-products, respectively.</p>
<p>8.4.6 (Only applicable to sites where crude steel is produced). GHG emissions accounting rules for the determination of the ResponsibleSteel crude steel GHG emissions intensity performance for the site.</p> <p>a. GHG offsets</p> <p>The determination of the site’s scope 1 emissions may not include carbon offsets or similar instruments.</p> <p>b. Reduction of emissions associated with export of by-products or co-products</p> <p>There is no reduction of GHG emissions associated with the export of by-products or co-products (including, for example process gases, dust, sludge, chemicals, oils and energy), for the purpose of determining the ResponsibleSteel crude steel GHG emissions intensity performance of the site.</p>

c. Allocation of emissions for exported intermediate products

Where a site produces and exports intermediate products such as coke, pig iron or GPI for steelmaking elsewhere, the GHG emissions associated with the production of the exported intermediate products should be deducted pro rata from the site's determination of its own ResponsibleSteel crude steel GHG emissions intensity performance.

d. Energy use for on-site processing of crude steel

GHG emissions associated with further on-site processing of crude steel are not counted as emissions for the purpose of determining the ResponsibleSteel crude steel GHG emissions intensity performance of the site.

The site should reduce its calculation of energy indirect (Scope 2) GHG emissions in accordance with the imported energy it uses for the on-site processing of crude steel. However, there is no reduction for emissions when excess energy from the production of crude steel is re-used for such further processing (see guidance).

e. Material exported from site as feedstock for downstream processing (carbon capture and utilisation, CCU)

GHG emissions that are captured on site and exported as feedstock for downstream utilisation (for example in the production of ethanol) are not counted as emissions for the purpose of determining the crude steel GHG emissions intensity of the site. Where this is the case the quantity of GHG emissions claimed as captured must be publicly reported and justified.

There is no additional reduction of GHG emissions due to the allocation of GHG emissions to the exported material as a co-product or by-product for the purpose of determining the ResponsibleSteel crude steel GHG emissions intensity performance of the site.

f. Energy exported from the site

There is no reduction of GHG emissions associated with the export of energy from the site (including, for example electricity, steam or heat), for the purpose of determining the ResponsibleSteel crude steel GHG emissions intensity performance of the site.

g. Carbon capture and storage

GHG emissions that are captured on-site and stored permanently on- or off-site are not counted as emissions for the purpose of determining the ResponsibleSteel crude steel GHG emissions intensity performance of the site. For emissions to be considered to be stored permanently the site must provide a public report that quantifies the claimed emissions captured, describes the technology used for storage, and justifies the claim that the stored emissions will not be released to the atmosphere for a minimum 100-year time horizon.

h. Emissions associated with waste exported from the site

GHG emissions associated with the storage or disposal of waste materials, whether on- or off-site, must be estimated and included as an emission for the purpose of determining the ResponsibleSteel crude steel GHG emissions intensity performance of the site.

i. Downstream indirect (Scope 3b) GHG emissions

Downstream life cycle considerations such as product GHG emissions in use and emissions associated with end-of-life disposal of products are excluded from the calculation of the ResponsibleSteel crude steel GHG emissions intensity performance of the site.

Guidance:

NOTE (8.4.6.d) This guidance is consistent with the focus on the GHG emissions associated with crude steel production, and avoids penalising sites that carry out energy intensive processing of crude steel after its production. However, it also means that sites that are efficient at re-using energy generated on site do not benefit from this in relation to their crude steel GHG emissions intensity performance figure.

The energy use associated with such on-site processing of crude steel is however taken into account in the determination of the carbon footprint for any steel product produced at the site, and will therefore be recognised in the environmental product declaration for the product (see Criterion 8.7). Sites that are efficient at re-using energy generated on site are therefore able to claim and benefit from lower GHG emissions for their steel products, and pass these benefits on to their customers in terms of lower embodied GHG emissions, even though it is not considered in the determination of the ResponsibleSteel crude steel GHG emissions intensity performance of the site.

(8.4.6.e and g) The quantity of GHG emissions claimed as captured must be justified. It is recognised that the carbon ‘captured’ may be fully or partially released to the atmosphere when the products of the downstream process are subsequently used – for example as fuel, as feedstock for further industrial processes, or at their end-of-life disposal. It is proposed that the steelmaker should receive the full benefit in terms of the reduction of the crude steel GHG emissions intensity for its site, and that the GHG emissions associated with downstream use should be recognised as direct (Scope 1) emissions downstream. The implication is that the downstream users should not receive any further GHG related credit or benefit from their use of the material, as this has already been fully claimed by the steelmaker at the point of production. Ethanol produced from the capture and use of process gases should be treated on the same basis as ethanol produced from other sources of material for the purpose of assessing GHG emissions associated with its use.

In this case a steelmaking site benefits from exporting GHG emissions that would otherwise be associated its own production of steel. The consistent application of the same approach means that the converse is the case when the steelmaking site exports energy (whether in the form of heat or electricity) to users beyond its site boundary, when the steelmaker continues to own the associated GHG emissions (see guidance to 8.4.6.f, below).

NOTE (8.4.6.f) This approach is consistent with the requirements of ISO 14064-1: 2018 for the treatment of exported electricity (see Annex E.3).

In this case a steelmaking site takes responsibility for the GHG emissions associated with the generation of energy that is used by others. The converse is the case when the steelmaking site exports its by-products as feedstock for downstream carbon capture and utilisation, when the steelmaker benefits from the apparent reduction in its emissions, although these may subsequently be emitted downstream (see guidance to 8.4.6.e, above).

A reduction is permitted when an intermediate energy product such as coke is exported from the site, as in this case the emissions associated with its production are not attributable to the site’s production of crude steel (see guidance to 8.4.6.c, above).

Note that different rules may be adopted for the purposes of GHG allocation to products, co-products and by-products, covered by Criterion 8.4.7 below.

8.4.7 GHG emissions accounting rules for the determination of the allocation of the site’s total GHG emissions to products, co-products and by-products, for the purpose of product carbon footprint declarations (see 8.6.3).

a. GHG offsets

Offsets may be used if these are permitted in conformity with the requirements of the regional or international standard(s) implemented by the site for the determination of product carbon footprints. If offsets are used, they must be disclosed on the environmental product declaration.

b. Reduction of emissions associated with export of by-products or co-products

GHG emissions may be allocated to products, by-products and co-products in conformity with the requirements of the regional or international standard(s) implemented by the site.

c. Allocation of emissions for exported intermediate products

GHG emissions must be allocated to exported intermediate products in conformity with the requirements of the regional or international standard(s) implemented by the site.

d. Energy use for on-site processing of crude steel

GHG emissions associated with energy used for on-site processing of crude steel must be determined in conformity with the requirements of the regional or international standard(s) implemented by the site.

e. Material exported from site as feedstock for downstream processing (carbon capture and utilisation, CCU)

GHG emissions may be allocated to material exported from the site as feedstock for downstream processing (carbon capture and utilisation, CCU) if this is permitted in conformity with the requirements of the regional or international standard(s) implemented by the site. If GHG emissions are allocated in this way, this must be disclosed on the environmental product declaration.

f. Energy exported from the site

GHG emissions associated with products and co-products may be reduced when energy is exported from the site if this is permitted in conformity with the requirements of the regional or international standard(s) implemented by the site. If GHG emissions allocated to products and co-products are reduced in this way, this must be disclosed on the environmental product declaration.

g. Carbon capture and storage

GHG emissions associated with products and co-products may be reduced when site emissions are captured and stored, if this is permitted in conformity with the requirements of the regional or international standard(s) implemented by the site. If GHG emissions allocated to products and co-products are reduced in this way, this must be disclosed on the environmental product declaration.

h. Emissions associated with waste exported from the site

GHG emissions associated with waste exported from the site must be determined in conformity with the requirements of the regional or international standard(s) implemented by the site.

i. Downstream indirect (Scope 3b) GHG emissions

Downstream indirect (Scope 3b) GHG emissions must be determined in conformity with the requirements of the regional or international standard(s) implemented by the site.

NOTE: additional specifications may be provided in future to improve the consistency of embodied carbon emissions data provided in environmental product declarations.

Criterion 8.5 Site-level GHG emissions reduction targets and planning

Drafting Notes

This section includes changes to the wording of the current ResponsibleSteel Standard (v1-0) criterion 8.4 as proposed in Draft 2-0 published in April 2021 (renumbered as C8.5), and subsequently agreed in principle in discussion with ResponsibleSteel members. Areas corresponding to these changes are highlighted in yellow.

Requirement 8.5.5 includes changes to the wording of the current ResponsibleSteel Standard (v1-0) criterion 8.4.5 (renumbered as C8.5.5), in relation to public reporting of information for a defined portfolio of sites, as agreed by the ResponsibleSteel Board in the urgent revision of June 2021.

Revisions to the Criteria that relate only to site certification (C8.1, C8.2, C8.3 & C8.5) that were not already raised in the April 2021 draft or as a result of the urgent revision of June 2021 will not be considered during the current revision process, unless these are strictly necessary to ensure compatibility with the new requirements for ‘steel certification’. Changes to C8.1, C8.2, C8.3 & C8.5 may be made over the coming months, if required, through the existing procedures for clarifications, interpretations and/or urgent revisions, as defined in sections 9 to 11 of the ResponsibleSteel Standard Development Procedures (Version 2-0, 18 June 2020). A full review of the requirements of the ResponsibleSteel Standard V1-0 was scheduled to take place three years after its approval in November 2019. ResponsibleSteel expects to initiate that process once the current process to define requirements for the ResponsibleSteel certification of steel have been completed.

Criterion 8.5: Site-level GHG emissions reduction targets and planning

There is a medium-term GHG emissions target and plan for the site that is aligned with the achievement of the corporate owner’s corporate level GHG emissions target(s).

8.5.1. There is a time-specific, medium-term target for the GHG emissions for the site or defined portfolio of sites that is at or below the trajectory required for the corporate owner to achieve its medium-term carbon emissions target for all of its sites, as specified under requirement 8.1.2.

For steelmaking sites, the target is defined in terms of the GHG emissions intensity of crude steel production (metric tonnes of CO₂ equivalent/ metric tonne crude steel) calculated in accordance with the international or regional standard as specified in 8.3.4.

Guidance:

(8.5.1) The site-level target must itself be below the average trajectory required to achieve the corporate owner’s overall corporate level target, OR, if this is not the case, the corporate owner must show that its whole portfolio of sites meets the requirements of 8.5.1 to 8.5.5, and so demonstrate that in combination its sites are on track to achieve its corporate level target.

8.5.2 There is a time-specific, medium-term target to reduce the net GHG emissions associated with the site’s use of imported electricity, where the GHG emissions associated with the use of imported electricity are significant.

Guidance:

(8.5.1, 8.5.2) the medium-term plan should cover activities planned for the following five to fifteen years, in accordance with the site’s financial and operational planning cycle. Longer term planning is also compatible with this guidance, so long as the time-specific milestones provide for effective monitoring in

the medium term.

(8.5.2) This requirement could be met, for example, through targets for: the purchase of electricity from low or zero carbon sources, **carbon offsets renewable energy certificates**, power purchase agreements, virtual power purchase agreements, or green tariffs paid in relation to the site's sourcing of electricity. GHG reductions achieved through the use of biofuels that do not meet recognised sustainability standards shall not be recognised as contributing to the achievement of the net GHG reduction targets associated with the use of imported electricity. Recognised sustainability standards for biofuels **include are currently limited to** the voluntary schemes recognised as meeting the sustainability criteria of the European Union's Renewable Energy Directive (EU) 2018/2001 (see list of approved Voluntary Schemes).

(8.5.2) Where a site introduces a new technology that has a major impact on reducing its direct emissions but results in an increase in the amount of imported electricity, the baseline for reducing net emissions for the imported electricity is set when the new technology is introduced.

(8.5.2) GHG emissions associated with imported electricity are considered significant if they represent more than 10% of the site's total (direct and indirect) GHG emissions.

(8.5.2) Where imported electricity is generated from the use of the site's own co- or by-products (e.g., process gases) whose GHG emissions have already been accounted for under 8.5.1, the GHG emissions for this imported electricity are considered to be zero for the purpose of calculating net GHG emissions under 8.5.2.

(8.5.2) Where offsets are used the offsets must be consistent with a specified, recognised international or national standard or regulation and must be publicly reported (see **8.5.1**). The implication is that sites would have broad freedom to select their own approach to reducing net GHG emissions and deciding what level of verification might be required to support their approach, so long as the approach is consistent with a recognised standard. Examples of recognised standards include:

- ART-TREES Standard, operational from 2020 under the emergent Forest Finance Facility
- The National Carbon Offset Standard in Australia

(8.5.2) Low-carbon energy procurement must be consistent with a specified, recognised international or national standard or regulation and must be publicly reported (see **8.5.1**). Examples of recognised standards include:

- The quality criteria set in the GHG Protocol Scope 2 guidance
- The RE100 credible claims guidance.

8.5.3. There are plans in place, approved by senior management, to achieve the site's GHG emissions target(s) within the specified timelines as defined in 8.5.1 and 8.5.2. The plans include:

- a. Time-specific milestones for each target from present through to the achievement of the medium-term target levels;
- b. Explicit quantification of the site's reduction of direct GHG (CO₂ e) or CO₂ emissions required to achieve the target(s) specified under 8.5.1;
- c. Specification of the international or regional standard that will be used to measure progress towards the target, and a description of the elements that are included or excluded from consideration (e.g., whether upstream scope 3 emissions are considered, and how any emissions associated with the site's products, co-products, by-products or waste are to be taken into account);
- d. Consideration of the technology, equipment, management system changes or other options to

achieve the targets over time;

- e. Consideration of the costs of installing any specified technology or equipment;
- f. Consideration of the proposed mechanism for financing the proposed technology or equipment;
- g. Consideration of external conditions that will need to be in place for the plan to be successfully implemented, or conditions that might prevent successful implementation.

Guidance:

(8.5.3) The content of the site's plans is considered to be commercially confidential and shall not be disclosed by ResponsibleSteel or any auditors acting to verify compliance with the requirements of the ResponsibleSteel standard. The specified medium- to long-term targets and progress towards their achievement would, however, be reported.

8.5.4. Progress on the implementation of the plans is monitored and reported to the site's board or equivalent oversight body on a regular basis, including an explanation of relevant issues such as changes to production in response to market conditions, closures for repairs or other significant factors, and the plans are updated if appropriate.

8.5.5 The medium-term targets for the site or defined portfolio of sites, as specified under requirements 8.5.1 and 8.5.2 and progress towards achieving these targets are reported publicly and on a regular basis.

Criterion 8.6 ResponsibleSteel ‘steel certification’ threshold requirements

Drafting Notes

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Note: This Criterion applies only to sites that produce crude steel and that wish to market or sell their steel or other products as ResponsibleSteel certified (referred to as ‘steel certification’).

Criterion 8.6. ResponsibleSteel ‘steel certification’ threshold requirements

The site may only market or sell steel products, co-products or by-products as ResponsibleSteel certified when:

- the ResponsibleSteel GHG emissions intensity performance of the site for the production of crude steel has been determined and is below the applicable threshold for ResponsibleSteel steel certification (only applicable to sites where crude steel is produced)
- the ResponsibleSteel GHG emissions intensity performance of the site for the production of crude steel has been verified as being at the level 1, 2 or 3 level (only applicable to sites where crude steel is produced)
- the embodied carbon for the steel product, co-product or by-product has been determined in accordance with a recognised international or regional standard and with the specifications of 8.4.7

8.6.1. Measurement of GHG emissions, crude steel production and scrap use (applicable to steelmaking sites only)

a. The site measures and records on a consistent basis:

- its annual crude steel production tonnage (tonnes)
- the quantity of scrap steel used in its annual production of crude steel (tonnes)
- the GHG emissions (tonne CO₂ e) associated with its crude steel production in accordance with the requirements specified in Criterion 8.4.1 to 8.4.7 of this standard

b. These data are collated and recorded for the site’s previous year of operation.

Glossary

Crude steel: Steel in the first solid state after melting, suitable for further processing or for sale. Synonymous with raw steel. (source: worldsteel)

Scrap: iron and steel material in metallic form that is recovered in multiple life cycle stages, including steel production processes, the manufacturing processes of final products and the end of life of final products, and is recycled as a raw material for steel production.

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

Guidance

(8.6.1.a) For the purpose of determining the ResponsibleSteel GHG emissions intensity for crude, crude steel production is measured at the point that continuous casting or ingot casting has been completed, and prior to any further processing such as roughing or hot rolling. The same point is used as the boundary for determination of the GHG emissions intensity for the crude steel production. ‘Tonnage’ means ‘production tonnage’ to this point, and not ‘financial tonnage’.

(8.6.1.a) For the purpose of determining the ResponsibleSteel GHG emissions intensity for crude steel, the quantity of scrap includes all external scrap and any home scrap that has been generated after the point at

which crude steel production is measured. Ferrous material generated within the site boundary and prior to the point at which crude steel production is measured (internal scrap) and that is put back into the steel production process is not included.

(8.6.1.b). Site-specific data must be for a specified year of operation and be representative of current production. The year of operation may be defined as a calendar year, or in relation to a reporting year for the site. The completed year immediately prior to the audit shall be used as the default period, but if an earlier year is used this shall be reported and justified.

8.6.2 Calculation of ResponsibleSteel crude steel GHG emissions intensity performance of the site (applicable to steelmaking sites only)

The site calculates and records its ResponsibleSteel crude steel GHG emissions intensity performance in accordance with the equation:

$$\text{ResponsibleSteel crude steel GHG emissions intensity performance (tonne CO}_2\text{ e/ tonne)} = \text{GHG emissions (tonne CO}_2\text{ e) for the previous year of operation} / \text{quantity of crude steel produced in the previous year of operation (tonne)}$$

Guidance:

Additional guidance to be developed as required.

8.6.3 Determination of the product carbon footprint, for steel products, co-products or by-products to be marketed or sold as ResponsibleSteel certified

- a. The site determines the product carbon footprint for any steel product, co-product or by-product it wishes to market or sell as ResponsibleSteel certified, in conformity with the applicable requirements of specified regional or international standards for reporting the product carbon footprint.
- b. The determination includes as a minimum the emissions of the products, co-products or by-products from 'cradle to gate' (including emissions associated with raw material extraction, raw material processing, transportation and product manufacturing). Additional aspects (for example in relation to end of life emissions) may be determined, but if they are the emissions for these aspects must be clearly disaggregated from the 'cradle to gate' data.
- c. The determination is in conformity with the specifications listed in 8.4.7 for the allocation of emissions.

Glossary:

Embodied carbon: GHG emissions associated with a product's life cycle, including at least the emissions associated with raw material extraction, transportation, raw material processing, and product manufacturing, reported per functional unit.

Product carbon footprint: sum of GHG emissions and GHG removals in a product system, expressed as CO₂ equivalents and based on a life cycle assessment using the single impact category of climate change

Note 1: A product carbon footprint can be disaggregated into a set of figures identifying specific GHG emissions and GHG removals. A product carbon footprint can also be disaggregated into the stages of the life cycle.

Note 2: The results of the quantification of the product carbon footprint are documented in the product carbon footprint study report, expressed in mass of CO₂e per functional unit.

(Source: adapted from ISO 14064:3 2019, 3.14 definition of 'carbon footprint of product')

Guidance:

(8.6.3) The requirement allows for co-products to be sold as ResponsibleSteel certified if the site wishes. The standard requires that the product carbon footprint is determined and declared if the product/ co-product is to be marketed or sold as ResponsibleSteel certified. It is not a requirement when this is not the case.

A range of standards, methodologies and tools may be used to support the determination and reporting of the product carbon footprint. These include:

International and Regional Standards:

- EN 15804:2012 + A2:2019, Sustainability of construction works – Environmental product declarations - Core rules for the product category of construction products
NOTE: The scope of production specified by ResponsibleSteel (raw material supply, transport and manufacturing) corresponds to the ‘cradle to gate’ life cycle stage modules A1, A2 and A3 of EN 15804.
- ISO 14040:2006, Environmental management – Life cycle assessment – Principles and framework
- ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 14064-1:2018, Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
- ISO 14064-2:2019, Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements
- ISO 14064-3:2019, Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements
- ISO 14067:2018, Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- ISO 20915:2018, Life cycle inventory calculation methodology for steel products
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of products and services.

Tools and methodologies:

- EUROFER Methodology Report: Life Cycle Inventory on Stainless Steel Production in the EU, 2019
- The European Union Product Environmental Footprint (PEF) methodology (currently in transition phase of development)
- The CARES EPD Tool, for application to construction products
- The International Stainless Steel Federation (ISSF) Life Cycle Inventory / Analysis of Stainless Steel
- The worldsteel life cycle inventory methodology (see ‘Life cycle inventory methodology reports for steel products’, World Steel Association, 2017, ISBN 978-2-930069-89-0)

8.6.4. (Only applicable to sites where crude steel is produced). The site may market and sell steel products produced at the site as being made with ResponsibleSteel certified steel when the following conditions are met:

- a. The GHG emissions intensity of the crude steel produced at the site has been determined in accordance with the requirements of Criterion 8.3 and Criterion 8.4.
- b. The GHG emissions intensity (metric tonnes of CO₂ equivalent/ metric tonne crude steel) of the crude steel produced at the site is below the applicable threshold as specified for carbon steel or for high alloy steel in accordance with the formula:

$$y < a - b(x)$$

Where:

y = GHG emissions intensity for crude steel production (tonne CO₂ e/ tonne crude steel)

x = the proportion of scrap used as an input material compared to crude steel produced

a = applicable ResponsibleSteel specified value of GHG emissions intensity for crude steel production using 0% scrap

b = applicable ResponsibleSteel specified gradient

	y = GHG emissions intensity for crude steel production using 0% scrap (tonne CO ₂ e/ tonne crude steel)	b (gradient)	GHG emissions intensity for crude steel production using 100% scrap (tonne CO ₂ e/ tonne crude steel)
Carbon steels	*. *	*. *	*. *
High alloy steels (including stainless steels)	To be determined		

c. the ResponsibleSteel GHG emissions intensity for crude steel production, y , (tonne CO₂ e/ tonne crude steel) has been verified as being at the level 1, 2 or 3 performance level where:

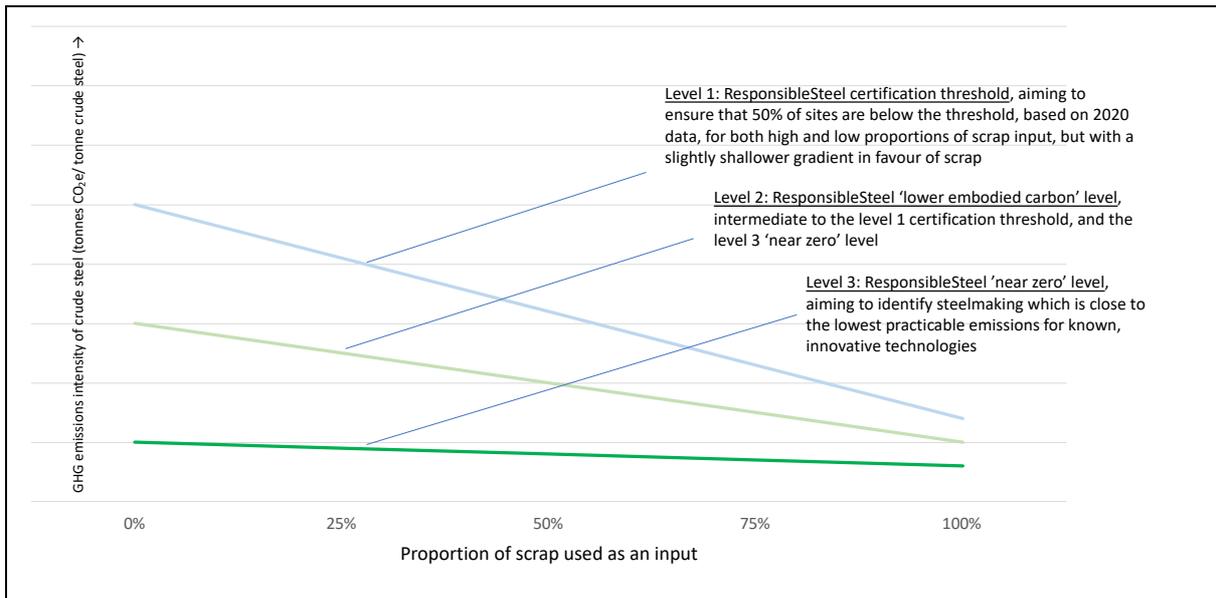
Level 1: $y < *. * - *. *(x)$ and $y \geq *. * - *. *(x)$

Level 2: $y < *. * - *. *(x)$ and $y \geq *. * - *. *(x)$

Level 3: $y < *. * - *. *(x)$

(see table and figure below)

Carbon steels	y = ResponsibleSteel crude steel GHG emissions intensity performance using 0% scrap as input (tonne CO ₂ e/ tonne crude steel)	b (gradient)	ResponsibleSteel crude steel GHG emissions intensity performance using 100% scrap as input (tonne CO ₂ e/ tonne crude steel)
Level 1 threshold	*. *	*. *	*. *
Level 2 threshold	*. *	*. *	*. *
Level 3 threshold	*. *	*. *	*. *



Guidance:

DRAFTING NOTES:

Performance thresholds and levels

It is currently proposed that three GHG emissions intensity performance levels will be set, as illustrated in the figure above. PLEASE NOTE THAT AN ALTERNATIVE 4-LEVEL OPTION IS NOW BEING CIRCULATED FOR CONSIDERATION, BUILDING ON FEEDBACK ON THE IMPORTANCE TO LINK THE LEVELS TO PROGRESS TO THE ACHIEVEMENT OF THE PARIS GOALS AND 'NET ZERO'/'NEAR ZERO' STEEL PRODUCTION BY 2050 (see note below, 'review and potential revision of performance levels').

Quantification of performance levels

Specific, quantified thresholds for the different levels will be specified after the GHG accounting rules have been agreed, based on the application of those rules for determining the ResponsibleSteel GHG emissions intensity performance (Criterion 8.4) have progressed.

The reason for this is that it is logically necessary that the same GHG accounting rules that will be used as the basis for determining site level performance for a specific site must also be applied when setting the levels themselves.

Further work is needed to ensure that there is confidence in the data source(s) on which the ResponsibleSteel performance thresholds will be based.

Review and potential revision of performance levels

Thresholds will be reviewed every 5 years, with the expectation that they will be reduced over time to support progress towards 'near zero' performance being achieved in 2050. Revised thresholds, as agreed, will be applicable after a 2-year transition

Stainless and other high alloy steels

GHG emissions intensity performance thresholds and corresponding performance levels for the ResponsibleSteel certification of high alloy steels (including stainless steels) have not been proposed at this time, and are subject to ongoing discussion with stakeholders. It is proposed that there will be the same number of performance levels as for carbon steels (e.g level 1, 2 and 3), and that the levels will reflect the same general principles as those for carbon steels (i.e. the level 1 threshold will be set at 'average' global

performance, level 3 will be set at 'near zero', and level 2 will be set at an intermediate level). The technical definitions of these levels remains to be agreed.

Criterion 8.7 GHG emissions disclosure and reporting

Drafting Notes

This criterion covers GHG emissions disclosure and reporting for sites that meet the requirements for 'ResponsibleSteel site certification' only, as well as for those that meet the additional requirements to sell ResponsibleSteel certified products ('steel certification').

Requirement 8.7.1 includes changes to the wording of the current ResponsibleSteel Standard (v1-0) requirement 8.5.1 in relation to public reporting of information for a defined portfolio of sites, as agreed by the ResponsibleSteel Board in the urgent revision of June 2021.

This section also includes changes to the wording of the current ResponsibleSteel Standard (v1-0) requirement 8.5.1, as proposed in Draft 2-0 published in April 2021 (renumbered as R8.7.1), and subsequently agreed in principle in discussion with ResponsibleSteel members, together with further revisions proposed to ensure full alignment and compatibility between the disclosure requirements for 'site certification' and for 'steel certification'.

Criterion 8.7: GHG emissions disclosure and reporting

Key measures of the site's GHG emissions performance are publicly disclosed.

8.7.1. The following information is submitted to the ResponsibleSteel Secretariat for the site or for the individual sites within a defined portfolio as specified in Criterion 8.5:

- a. The total GHG (CO₂ e) or CO₂ emissions for the site calculated in accordance with the requirements of Criterion 8.3 and in accordance with the specifications defined in Criterion 8.4 where these have been applied.
- b. The basis for the determination of the total GHG emissions for the site, including:
 - i. The international or regional standard(s) used;
 - ii. Whether or not the determination has been prepared in conformity with the requirements specified in Criterion 8.4;
 - iii. Whether the determination includes the purchase of renewable energy certificates or similar mechanisms such as power purchase agreements, virtual power purchase agreements, or green tariffs paid in relation to the sourcing of the site's electricity, and if so a description of the source and quantity of such offsets or agreements;
 - iv. A clear description of the scope boundary for the determination, including a clear description of which emissions associated with the extraction, preparation, processing and transportation of input materials have been included or excluded in the determination;
 - v. An explanation of the greenhouse gases that have been taken into account in the determination or, if only CO₂ emissions have been considered, a clear statement to this effect;
 - vi. The level of assurance provided by the verification body for the site's determination of the reported GHG emissions, in accordance with the definitions and specifications for level or assurance specified in *ISO 14064-3:2019 Greenhouse gases – Part 3: Specification with guidance for the verification and validation of greenhouse gas statements*.

- vii. The date of the determination
- viii. An explanation of variations in figures reported using different measurement standards if more than one standard has been used by the site and different figures have been reported as a result.
- c. The time-specific medium-term targets for GHG emissions for the site or the defined portfolio of sites as determined to meet Requirements 8.5.1 and 8.5.2.
- d. In the case of a portfolio of sites, in addition to the elements listed in 8.7.1a to 8.7.1c, above:
 - i. the number of sites in the defined portfolio
 - ii. the names of the sites in the defined portfolio
 - iii. a consolidated summary of each of the elements listed in 8.7.1a to 8.7.1c, for the portfolio as a whole.

(8.7.1) Normative Guidance

The certification body must provide the information listed in 8.7.1.a) to d) to the ResponsibleSteel Secretariat for review together with the public summary of its certification report, before a certification decision is taken.

ResponsibleSteel will publish a table on its website listing all the sites that are either ResponsibleSteel certified or that are included within a portfolio of sites as specified under Criterion 8.5. The table will be available to the public. In the case of sites that are certified on the basis of an individual site-specific medium-term target for GHG emissions under Criterion 8.5, the table will list the site-specific information specified in 8.7.1.a) to c) for the individual site. In the case of sites that are certified on the basis of a medium-term target for GHG emissions for a portfolio of sites under Criterion 8.5, the table may list the consolidated summary information as specified in 8.7.1.d for the portfolio of sites. If the publicly reported information is for a portfolio of sites this will be clearly stated in the table with the relevant site information, and the individual site-specific information will be held by ResponsibleSteel as confidential information.

The information specified in 8.7.1.a) to d) must be reviewed by the certification body at the time of the site's surveillance visit and if the information has been revised the certification body must submit the updated information to the ResponsibleSteel Secretariat which will update the table of public information as applicable.

(8.7.1) Each site within the portfolio must meet the requirements of Principle 8 individually in its own right, except as specified in relation to defining GHG targets across a portfolio of sites to meet the requirements of 8.5.1 and 8.5.2, the public reporting of information here under 8.7.1, and in relation to the public reporting of the average of the ResponsibleSteel crude steel GHG emissions intensity for the site under 8.7.2. Sites are not required to be assessed or certified for conformity with the other Principles of the ResponsibleSteel Standard.

Guidance

(8.7.1.b) *ISO 14064-3:2019 Greenhouse gases – Part 3: Specification with guidance for the verification and validation of greenhouse gas statements* defines two possible levels of assurance: verification at a 'reasonable level of assurance', and verification at a 'limited level of assurance'. Verification should preferably be provided at the reasonable level of assurance, but must be provided at least at the 'limited level of assurance as defined in ISO 14064-3 (2019). Under this requirement the site is required to report

the level of assurance provided for the verification of its GHG emissions data.

Note: This Requirement applies only to sites that produce crude steel and that wish to market or sell their steel or other products as ResponsibleSteel certified (referred to as ‘steel certification’).

8.7.2. Crude steel GHG emissions intensity performance

a. The following information is submitted to the ResponsibleSteel Secretariat for each site that wishes to market or sell steel or other products produced at the site as ResponsibleSteel certified:

- i. the name of the site
- ii. the ResponsibleSteel crude steel GHG emissions intensity performance of the site (metric tonnes of CO₂ e/ metric tonne crude steel), as determined in conformity with the requirements of Criterion 8.4.
- iii. the proportion of scrap used as an input for crude steel production at the site (as determined in 8.6.1)
- iv. the quantity of crude steel produced annually at the site (metric tonnes crude steel)
- v. The level of assurance provided by the verification body for the site’s determination of the reported GHG emissions, in accordance with the definitions and specifications for level or assurance specified in ISO 14064-3:2019 Greenhouse gases – Part 3: Specification with guidance for the verification and validation of greenhouse gas statements.
- vi. The date of the determination
- vii. whether the crude steel GHG emissions intensity performance for the site will be reported publicly for the site individually, or as a weighted average with other sites.

b. Site level crude steel GHG emissions intensity data under R8.7.2 may be disclosed as an average of the data for multiple sites in a group if the sites within the group:

- i. Have all achieved the ResponsibleSteel threshold level of performance (level 1) for the GHG emissions intensity of the crude steel produced at the site; and
- ii. Are managed within the same business unit; and
- iii. Produce the same type of steel: carbon and low alloy steels (<8% alloys and other elements); stainless steels (>10.5% chromium); high alloy steels (>=8% alloys and <10.5% chromium)

c. In the case of a site that wishes to disclose its crude steel GHG emissions intensity performance as a weighted average, in addition to the elements listed in 8.7.2a, above:

- i. the number of sites to be included in the group average
- ii. the names of the sites to be included in the group average
- iii. the name of the business unit under which the sites are managed
- iv. the type of steel produced by the sites (carbon and low alloy steels (<8% alloys and other elements); stainless steels (>10.5% chromium); high alloy steels (>=8% alloys and <10.5% chromium).

(8.7.2) Normative Guidance

The certification body must provide the information listed in 8.7.2.a) and c) to the ResponsibleSteel

Secretariat for review together with the public summary of its certification report, before a certification decision is taken.

The ResponsibleSteel Secretariat will determine the ResponsibleSteel crude steel GHG emissions intensity performance level (1, 2 or 3) that has been achieved by the site or group of sites, based on the submitted data, and in accordance with the threshold specifications that are applicable at the time.

On the issue of a certificate the ResponsibleSteel Secretariat will add information about the crude steel GHG emissions intensity performance for each site to the table of certified sites published on the ResponsibleSteel website. In the case of sites that choose to report their crude steel GHG emissions intensity performance publicly for individual sites, the table will list the site-specific information specified in 8.7.1.a i) to iii) for the site, together with the ResponsibleSteel crude steel GHG emissions intensity performance level (1, 2 or 3) that has been achieved for the site. In the case of sites that choose to report their crude steel GHG emissions intensity performance as an average across a group of sites, the table will list the average of the site-specific information specified in 8.7.1.a ii) and iii) weighted according to the quantity of crude steel produced at each site in the group, together with the ResponsibleSteel crude steel GHG emissions intensity performance level (1, 2 or 3) that has been achieved for the group of sites as a whole, based on the weighted average.

In the case of sites that choose to report their crude steel GHG emissions intensity performance as an average across a group of sites, this will be clearly stated in the table with the relevant information for the site, and the individual site-specific information specified in 8.7.2.a ii), iii) and iv) will be held by ResponsibleSteel as confidential information.

The information specified in 8.7.2.a) and b) must be reviewed by the certification body at the time of the site's surveillance visit and if the information has been revised (including any changes to the emissions intensity achieved at specific sites, and/or changes to the sites that are to be included in the group average) the certification body must submit the updated information to the ResponsibleSteel Secretariat which will update the table of public information as applicable.

Guidance

(8.7.2) The approach would permit GHG emissions to be averaged between sites using different technologies to produce carbon and low alloy steels, including for example EAF and BF/BOF sites within one group of sites reporting an averaged GHG emissions intensity for its crude steel production.

(8.7.2) When a site has chosen to report its ResponsibleSteel GHG emissions intensity performance and performance level to ResponsibleSteel as an average across a group of sites it may not report or claim a different site-specific ResponsibleSteel GHG emissions performance or performance level to other stakeholders in any circumstances for other purposes. If this were to occur and be brought to the attention of ResponsibleSteel the site would be taken out of the group and the group average would be recalculated accordingly.

DRAFTING NOTES

(8.7.2.b) Further guidance/ discussion is required on the definition and application of the terms 'business unit' and 'type of steel'

(8.7.2.b) Further guidance/ discussion is required on the situation where a single site produces steel of more than one type.

8.7.3. The embodied carbon for any product, co-product or by-product that is marketed or sold as ResponsibleSteel certified as determined in 8.6.3 is publicly available on request, together with:

- a. reference to the specific international or regional standard that has been used as the basis of the determination of the embodied carbon for the product, co-product or by-product
- b. the declaration of the ResponsibleSteel crude steel GHG emissions intensity performance level (1, 2 or 3) for the crude steel the product is made from, where applicable.

Guidance:

(8.7.3) The declaration of the product carbon footprint (cradle to gate emissions) for the product must be communicated clearly and be clearly distinguished from the consideration of GHG emissions related to further processes taking place beyond the production site gate, for example in relation to emissions associated with the product's use and/or end of life disposal, and/or potential benefits associated with its reuse, recovery, or recyclability.

(8.7.3) The declaration of the product carbon footprint of the product will follow the rules for disclosure and reporting as specified in the applicable international or regional standard(s) referenced in 8.6.3. The rules for averaging emissions across product categories or sites will also be as required by the applicable international or regional standard(s) and are independent of the rules for determining and reporting the GHG emissions intensity for crude steel production as specified in 8.7.2.

Annex 1a Glossary (previously approved)

Already included in the ResponsibleSteel Standard v1-0, approved November 2019:

Carbon dioxide equivalent, CO₂e: Unit for comparing the radiative forcing of a GHG to carbon dioxide.

(Adopted from ISO/CD 19694-1:2016 Stationary source emissions. Determination of greenhouse gas (GHG) emissions in energy-intensive industries - Part 1: General aspects).

Crude steel: Steel in the first solid state after melting, suitable for further processing or for sale. Synonymous with raw steel.

(Adopted from worldsteel).

Note: crude steel production is measured at the point that continuous casting or ingot casting has been completed, and prior to any further processing such as the roughing or hot rolling.

GHG offset: Offsets are discrete GHG reductions used to compensate for (i.e., offset) GHG emissions elsewhere, for example to meet a voluntary or mandatory GHG target or cap. Offsets are calculated relative to a baseline that represents a hypothetical scenario for what emissions would have been in the absence of the mitigation project that generates the offsets. To avoid double counting, the reduction giving rise to the offset must occur at sources or sinks not included in the target or cap for which it is used.

(Adopted from The Greenhouse Gas Protocol).

Net GHG emissions: The total GHG emissions (CO₂ equivalent) assigned to a product, process or activity minus the total GHG emission reductions claimed by the site as carbon offsets or through other mechanisms.

Net-zero GHG emissions: Refers to achieving an overall balance between emissions produced and emissions taken out of the atmosphere. ResponsibleSteel will work with its membership to agree a technical definition for net-zero GHG emissions as applicable to the scope of this standard.

Steel Product: Product produced from steel and shipped out from steelworks.

EXAMPLE Hot rolled steel, pickled hot rolled steel, cold rolled steel, finished cold rolled steel, electrogalvanized steel, hot-dip galvanized steel, tin-free steel, tinplated steel, organic coated steel, section, plate, rebar, engineering steel, wire rod, seamless pipe, UO pipe, welded pipe.

(Adopted from ISO20915:2018(en) Life cycle inventory calculation methodology for steel products)

Annex 1b Glossary (new or updated terms)

New terms proposed for inclusion in updated glossary

DRAFTING NOTE: Deletions are indicated ~~like this~~. Changes are indicated like this.

Product carbon footprint: sum of GHG emissions and GHG removals in a product system, expressed as CO₂ equivalents and based on a life cycle assessment using the single impact category of climate change

Note 1: A product carbon footprint can be disaggregated into a set of figures identifying specific GHG emissions and GHG removals. A product carbon footprint can also be disaggregated into the stages of the life cycle.

Note 2: The results of the quantification of the product carbon footprint are documented in the product carbon footprint study report, expressed in mass of CO₂e per functional unit.

(Source: adapted from ISO 14064:3 2019, definition of 'carbon footprint of product' 3.14)

Carbon intensity of electricity: the CO₂ GHG emissions produced per kilowatt hour of electricity consumed.

Carbon steel: A type of steel of which the main alloying element is carbon.

(Source: worldsteel Glossary: the language of steel)

Co-product: any of two or more products coming from the same unit process or product system

(Source: ISO 14044:2006, 3.10)

Credit GHG emission: GHG emission that corresponds to exported material and electricity or steam.

(Adopted from ISO 14404:2017 Calculation method of carbon dioxide emission intensity from iron and steel production)

~~**Direct GHG or CO₂ emissions:** GHG emissions (CO₂ equivalent) from production facilities within the site boundary. Direct emissions correspond to 'scope 1' emissions as referred to in the GHG Protocol.~~

Direct (Scope 1) GHG emissions: GHG emissions that result from sources within the site boundary.

Note 1. A GHG source is any physical unit or process that releases GHG into the atmosphere

Note 2. Direct (Scope 1) GHG emissions can include the CO₂ emissions from fuel consumption.

(Adapted from Scope 1 definition for an organisation, applied to the site. Source GRI Standards, GRI 305: Emissions. Global Sustainability Standards Board, 2016).

Direct Reduced Iron (DRI): Direct Reduced Iron (DRI) is the product of the direct reduction of iron ore in the solid state by carbon monoxide and hydrogen derived from natural gas or coal.

Most gas-based direct reduction plants are part of integrated steel mini-mills, located adjacent to the electric arc furnace (EAF) steel plant. DRI can be either hot or cold charged to the EAF. Some steel companies ship DRI from their captive direct reduction plants to their remote steel mills and a small volume of DRI is sold to third parties. In India there are many small rotary kiln furnaces producing DRI, known locally as sponge iron, using coal as energy and reductant source. Some of the sponge iron plants are captive to steel mills, but there is a significant domestic merchant market, India producing 57% of its crude steel in electric arc furnaces (2016).

(Source: International Iron Metallics Association (IIMA) <https://www.metallics.org>, 2020).

Downstream indirect (Scope 3b) GHG emissions: Other indirect (Scope 3) GHG emissions that occur outside

of the site boundary and downstream of its activities.

Embodied carbon: GHG emissions associated with a product's life cycle, including at least the emissions associated with raw material extraction, raw material processing, transportation and product manufacturing, reported per functional unit.

End of life scrap: scrap from after the end of life of final products

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

Energy indirect (Scope 2) GHG emissions: GHG emissions that result from the generation of or purchased or acquired electricity, heating, cooling and steam consumed by the site.

(Adapted from Scope 2 definition for an organisation, applied to the site. Source GRI Standards, GRI 305: Emissions. Global Sustainability Standards Board, 2016).

Exported: in the context of the determination of GHG emissions 'exported' refers to energy, materials or products (including intermediate products, by-products or co-products) that leave the site across the site boundary.

External scrap: scrap provided from outside of the steelworks, including manufacturing scrap and end of life scrap

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

Ferro alloy: alloy of iron with non-iron alloy metals, such as manganese, silicon or chromium used in the steelmaking process.

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

Final product: product that requires no additional transformation prior to its use

EXAMPLE Automobiles, building structures, building envelopes, packaging.

(Source ISO/TS 18110:2015, 2.2, modified – The example has been added.)

Global warming potential, GWP: Factor describing the radiative forcing impact of one mass-based unit of a given GHG relative to an equivalent unit of carbon dioxide over a given period of time (from EN 19694-1: 2016(E))

Note: GWP factors published by the Intergovernmental Panel on Climate Change (IPCC) shall be used.

Granulated Pig Iron (GPI): From time to time the supply of hot metal from a blast furnace may exceed the demands of the steel plant, for example due to problems further downstream. In most integrated steel mills, the blast furnace plants are not equipped with pig casters, meaning that the excess hot metal has to be cast into an open-air sand pit, a process known as "pooling" or "beaching." The ensuing dust and fumes constitute an environmental hazard, and the resultant pool or beach iron takes a long time to solidify before it can be crushed into usable material.

Granulation of the excess hot metal is a process that deals with these issues and produces a by-product - Granulated Pig Iron (GPI) - that can readily be used internally, for example as BOF coolant, or sold to third parties as feedstock for electric arc furnaces, cupolas and induction furnaces.

(Source: International Iron Metallurgy Association (IIMA) <https://www.metallurgy.org>, 2020).

Greenhouse Gas, GHG: Gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds

Note to entry: GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

(Adopted from ISO/CD 19694-1:2016 Stationary source emissions. Determination of greenhouse gas (GHG) emissions in energy-intensive industries - Part 1: General aspects)

NOTE: nitrogen trifluoride (NF₃) was added to the Greenhouse Gas Protocol list of GHGs in 2013.

Home scrap: scrap from a downstream steel production process within the steelworks (e.g. rolling, coating) that is returned to steel making processes (e.g. BOF or EAF)

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

Hot Briquetted Iron (HBI): Hot Briquetted Iron (HBI) is a premium form of [DRI](#) that has been compacted at a temperature greater than 650° C at time of compaction and has a density greater than 5,000 kilograms per cubic metre (5,000 kg/m³).

HBI was developed as a product in order to overcome the problems associated with shipping and handling of DRI - due to the process of compaction it is very much less porous and therefore very much less reactive than DRI and does not suffer from the risk of self-heating associated with DRI.

The principal market for HBI is electric arc furnace (EAF) steelmaking, but HBI also finds application as a trim coolant in basic oxygen furnace (BOF) steelmaking and as blast furnace feedstock.

(Source: International Iron Metallics Association (IIMA) <https://www.metallics.org>, 2020).

Imported: in the context of the determination of GHG emissions 'imported' refers to energy or materials that are brought into a site from outside of the site boundary.

Industrial gas: gas for steel production other than *fuels* ([3.17](#)) or reducing agent

EXAMPLE Oxygen, nitrogen, argon, hydrogen, carbon dioxide, compressed air.

Note 1 to entry: Hydrogen can be used as a fuel, or is included here as an industrial gas when used as an uncombusted industrial gas, e.g. for the provision of reducing atmospheres in production processes.

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

Intermediate product: the product when an input material undergoes processing on site before being used in subsequent processes. For example, coke may be produced on site from coking coal as an intermediate product prior to its use in the blast furnace. Intermediate products may be used in subsequent processes on site, or may be exported from the site for use outside of the site boundary.

Internal scrap: scrap from a crude steel making unit process that is then recycled within the same unit process [e.g. basic oxygen furnace (BOF) or electric arc furnace (EAF)]

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

Manufacturing scrap: scrap from the manufacturing processes of final products, such as automobiles and buildings

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

Other indirect (Scope 3) GHG emissions: indirect GHG emissions not included in energy indirect (Scope 2) GHG emissions that occur outside of the organisation, including both upstream and downstream emissions.

(Source GRI Standards, GRI 305: Emissions. Global Sustainability Standards Board, 2016).

Pig iron: Pig iron is the product of smelting iron ore (also ilmenite) with a high-carbon fuel and reductant such as coke, usually with limestone as a flux. Charcoal and anthracite are also used as fuel and reductant. Pig iron is produced by smelting iron ore in blast furnaces or by smelting ilmenite in electric furnaces.

(Source: International Iron Metallurgy Association (IIMA) <https://www.metallurgy.org>, 2020).

Process gas: Gas that is produced as part of the processes on the steel production site

EXAMPLE Coke oven gas, blast furnace gas, BOF gas.

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

Scope of GHG emissions: Classification of the operational boundaries where GHG emissions occur

Note 1: Scope classifies whether GHG emissions are created by an organization itself, or are created by other related organizations, for example electricity suppliers or logistics companies.

Note 2: There are three classifications of Scope: Scope 1, Scope 2 and Scope 3.

Note 3: The classification of Scope derives from the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), 'GHG Protocol Corporate Accounting and Reporting Standard', Revised Edition, 2004.

Scrap: iron and steel material in metallic form that is recovered in multiple life cycle stages, including steel production processes, the manufacturing processes of final products and the end of life of final products, and is recycled as a raw material for steel production

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)

For the purpose of determining the ResponsibleSteel GHG emissions intensity for crude steel scrap includes external scrap and home scrap that has been generated at any point after

~~Metric Tonne (T):~~ A metric tonne, equivalent to 1,000 kilograms or 2,204.6 pounds or 1.1023 short ton

(Adopted from worldsteel)

Upstream indirect (Scope 3a) GHG emissions: Other indirect (Scope 3) GHG emissions that occur outside of the site boundary and upstream of its activities.

~~Waste:~~ Any substance or object which the holder discards or intends or is required to discard.

~~(Adopted from EU Guidance on the interpretation of key provisions of Directive 2008/98/EC on waste)~~

Waste: materials disposed of in landfills, both internal and external to steel works, or incinerated.

(Source: ISO 20915: 2019(E) Life cycle inventory calculation methodology for steel products.)