PARTNER ORGANIZATIONS

STEEL SCIENCE-BASED TARGET SETTING GUIDANCE

Draft for Public Consultation

November 2022

Developed by:

SBTi through a technical partnership with ETC

Contents

1. INTRODUCTION

Science-based targets (SBTs) specify how much and how quickly a company would need to reduce its greenhouse gas (GHG) emissions in order to align with the goals of the Paris Agreement.

Globally, the steel sector's direct CO_2 emissions amounted to 2.6 Gt in 2019, equivalent to about 7% of total energy sector emissions and 25% of industrial CO_2 emissions with a further 1.1 Gt CO_2 indirect emissions from electricity consumption (IEA, 2020). Demand for steel is projected to grow by approximately 12% by 2050 under a 1.5°C scenario (IEA, 2021) and even more under a business-as-usual scenario. Meeting this demand while reducing GHG emissions is a significant challenge.

For these reasons, urgent action is needed for steel companies to decarbonize. SBTs allow companies to show that their plans align with the latest climate science.

The purpose of this guidance document and accompanying tools is to provide companies with the resources they need to set 1.5°C-aligned near- and long-term climate targets at a corporate level. This document is structured as follows: Section 1 gives the overview of the development process of this guidance. Section 2 provides the context of near-term, long-term and net-zero science-based targets. Section 3 explains the scientific basis for sector-specific 1.5°C decarbonization pathways and the sectoral decarbonization approach (SDA). Section 4 summaries the sector-specific GHG accounting criteria and recommendations. Section 5 forms the main part of this guidance on target setting. This includes core boundary, emissions inventory and how to deal with issues that are specific to the steel sector, with examples on how different types of companies can use the tools, and guidance for submitting a target for validation.

Overview of the development process

This guidance is the result of a technical partnership between SBTi and Energy Transitions Commission (ETC) (as part of Mission Possible Partnership[1]), who provided technical support on developing more granular decarbonization pathways that are within the carbon budget and 1.5°C aligned for the iron and steel sector.

[1] The Mission Possible Partnership (MPP) and the Science Based Targets initiative (SBTi) have formed a technical collaboration to enhance the compatibility of the SBTi Sector Projects and MPP Sector Transition Strategies, providing companies in high-emitting sectors with a simplified roadmap to scale climate actions and accelerate decarbonization in line with 1.5°C.

A transparent multi-stakeholder consensus-based development process is central to all the SBTi's sector projects. The steel project is accompanied by an Expert Advisory Group (EAG) composed of 29 organizations from industry, civil society and academia to provide detailed input during the development of this guidance and tool. EAG members were selected and invited to join the expert group based on their expertise, geographic location, relationship to and influence in the sector and, as regards companies, ambition to align their organization with the 1.5°C climate goals.

EAG member organizations:

Aceros AZA S.A.	Nippon Steel Corporation
Aperam	Outokumpu Oyi
ArcelorMittal	POSCO
Baoshan Iron & Steel Co Ltd (Baosteel)	Potsdam Institute for Climate Impact Research
Bellona	ResponsibleSteel
BlueScope Steel Limited	Rocky Mountain Institute (RMI)
Cleveland-Cliffs Inc.	Severstal PAO
E3G	Tata Steel
Energy Transitions Commission (ETC)	Transition Pathway Initiative
Environmental Coalition on Standards (ECOS)	Vallourec
Gerdau	Voestalpine AG
Imperial College	World Steel Association
JSW Steel Ltd	WWF (Finland)
Liberty Steel UK	

The SBTi is very grateful for the input and engagement from EAG members. The EAG's role was advisory and final sign-off for deliverables is by the SBTi. Therefore, opinions expressed within this document may not represent the views of every EAG organization.

Funding for this project was provided by ArcelorMittal. Providing funding did not confer on ArcelorMittal any special position in the governance of the project.

Public webinars will be held on 23 November 2022 to start this public consultation period, which will be open from 23 November 2022 to 23 January 2023, in order to obtain input from stakeholders on this guidance document and the accompanying target-setting tool.

Why does steel warrant dedicated pathways and tools?

Allocation of the global carbon budget to sectors is done through bottom-up, top-down and hybrid scenarios that aim to meet climate goals in a specific way, including considerations of technology, cost and socioeconomic factors, to form a narrative of emissions reductions across sectors. Therefore, the size of the allocation to each sector depends partially on the decarbonization levers available and their cost. As a large industrial sector, iron and steel production contributes a significant source of carbon emissions driven mainly by the reduction of iron ore with carbon in the form of metallurgical coal, but also from fuels and electricity. Therefore, the rate at which the sector can decarbonize may differ from the overall rate of decarbonization possible by society as a whole. Furthermore, modelling and data on steel is available in literature on emissions scenarios. For these reasons, a dedicated steel pathway and specific guidance to allow companies to set SBTs is justified.

Why is the steel sector divided into two decarbonization pathways?

The pathway for well-below 2°C for the iron and steel sector provided by SBTi in the past did not differentiate raw material sources: iron ore and secondary material (scrap). Considering the future global steel demand and the availability of scrap, it is recognized that an appropriate disaggregation of the pathway into such subsectors would encourage diverse types of companies in the sector to set science-based targets, while incentivizing three important aspects: the decarbonization of ore-based production through levers other than only increasing scrap input, a general sectoral shift towards greater circularity in line with 1.5°C pathways, and decarbonization of secondary-based production - while conserving the carbon budget for the sector. Therefore, this guidance document provides two sector decarbonization pathways, and each individual company's pathway will depend on its scrap share in both its base and target years. For more details on the rationale for this approach, see Appendix 2.

How does this guidance change target-setting requirements compared to previous practice?

The SBTi already offered 2°C and well-below 2°C pathways for steel prior to publication of this detailed guidance. This guidance offers a more granular methodology by introducing an iron & steel core SDA boundary, differentiated pathways based on scrap input, new requirement for targets covering purchased intermediate materials and a mandatory scope 3 target covering upstream emissions from fuels, as well as aligning to the latest SBTi criteria, Net-Zero Standard and 1.5°C ambition. Although the publication of this guidance does not oblige companies that have already set 2°C or well-below 2°C targets to recalculate their targets ahead of normal update schedules[2], they are strongly encouraged to do so by updating their target ambition to 1.5°C and setting net zero targets.

[2] According to the SBTi general criteria, existing targets should be recalculated if there are significant changes that could compromise relevance and consistency of the existing target, or at least every 5 years.

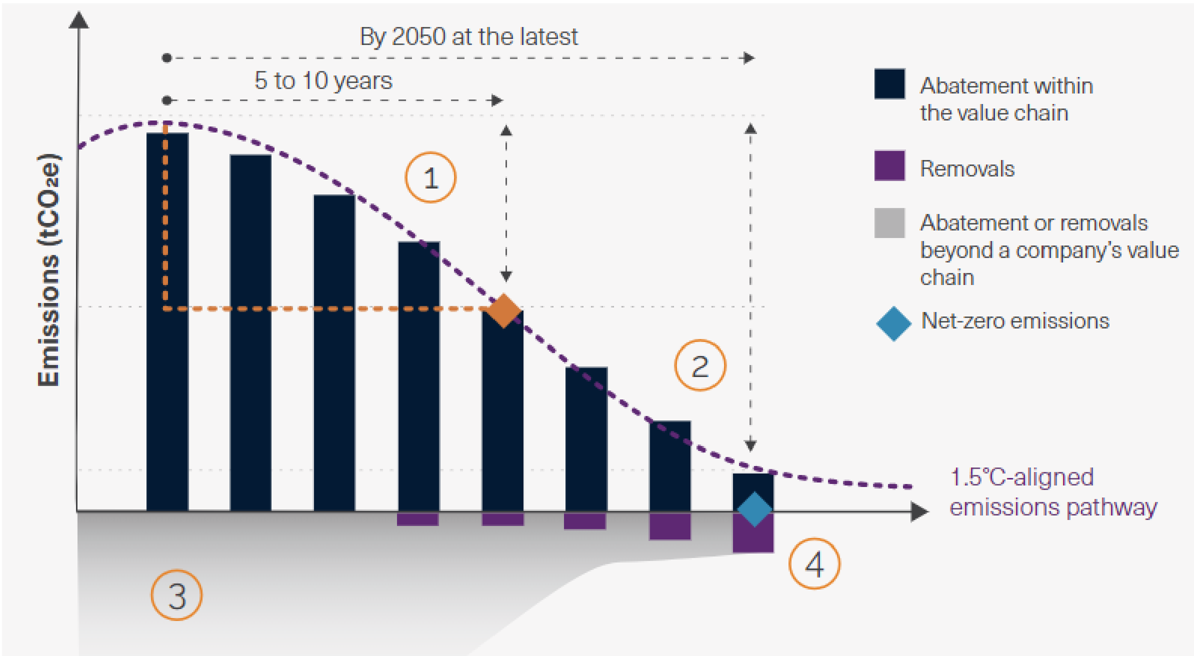
2. NEAR-TERM, LONG-TERM AND NET-ZERO SCIENCE-BASED TARGETS

The SBTi Net-Zero Standard was published in October 2021. It was developed to guide corporates towards a state of net-zero that is consistent with societal climate and sustainability goals. The Net-Zero Standard sets out four key elements that make up a corporate net-zero target as depicted in Figure 1: (i) near-term SBT, (ii) long-term SBT, (iii) beyond value chain mitigation (optional) and (iv) Neutralization of any residual emissions. It makes a distinction between near-term and long-term SBTs:

- A near-term SBT has a timeframe of 5-10 years.
- A long-term SBT is a target to reach the residual emissions level[3] by 2050 at the latest, and commit to neutralizing these residual emissions to reach net-zero.

Companies wishing to set a net-zero target must set both near-term and long-term targets. Alternatively, companies may choose to set just a near-term target (but they cannot set only a long-term target).

[3] Residual emissions are emissions sources that remain unabated in a specific year of a mitigation scenario. Long-term SBTs are consistent with the level of residual emissions in the year of global or sector net-zero in 1.5°C-aligned mitigation pathways with low or no overshoot.



1. **To set near-term SBTs:** 5–10 year emission reduction targets in line with 1.5°C pathways
2. **To set long-term SBTs:** Target to reduce emissions to a residual level in line with 1.5°C scenarios by no later than 2050
3. **Beyond value chain mitigation:** In the transition to net-zero, companies should take action to mitigate emissions beyond their value chains. For example, purchasing high-quality, jurisdictional REDD+ credits or investing in direct air capture (DAC) and geologic storage
4. **Neutralization of residual emissions:** GHGs released into the atmosphere when the company has achieved their long-term SBT must be counterbalanced through the permanent removal and storage of carbon from the atmosphere.

Figure 1: Key elements of the Net-Zero Standard

Beyond value chain mitigation (BVCM)

The SBTi Net-Zero Standard makes clear that meeting a near- or long-term SBT must be achieved through real reductions of a company's scope 1, 2 and 3 emissions.

However, it is recognized that businesses can play a critical role in accelerating the net-zero transition and in addressing the ecological crisis by investing in mitigation actions beyond their value chain. Additional investments like these could help increase the likelihood the global community stays within a 1.5°C carbon budget, but are not a substitute for the rapid and deep reduction of a company's own value chain emissions.

Neutralization of residual emissions

According to the SBTi Net-Zero Standard, residual emissions, i.e. GHGs still being released into the atmosphere when the company has achieved its long-term SBT, must be counterbalanced through the permanent removal and storage of carbon from the atmosphere to reach net-zero emissions (Figure 1).

Examples of neutralization include, but are not limited to: Direct Air Capture (DAC) and storage; bioenergy with carbon capture and storage (BECCS); improved soil management; improved forest management; land restoration, e.g., of peatland, terrestrial forests or mangroves.

3. STEEL DECARBONIZATION PATHWAYS

To create tools that companies can use to calculate SBTs, three steps are followed by SBTi:

- The global carbon budget and its allocation to the sector is determined.
- An emissions scenario describing a plausible decarbonization trajectory pathway that fits within the sector budget is chosen based on a comparison with different scenarios and discussion with the EAG.
- Target setting methods such as the Sectoral Decarbonization Approach (SDA) are used to translate the sector pathway into company targets.

Target setting method: Sectoral Decarbonisation Approach (SDA)

The SDA, also known as the “sector-specific intensity convergence” approach, is a target-setting methodology allowing companies to model physical intensity GHG reduction targets that align with the sector-specific pathway of an underlying climate scenario.

In the SDA, annual emissions pathways are divided by forecasted industry activity to define a carbon intensity curve. Targets are set by assuming that all companies converge to the same intensity level as the sector by the year 2050. SBTs are set in the near term (5 to 10 years) along this convergence path, the steepness of which is defined by the relative intensity of the company compared to the sector in the base year and the rate of forecasted company activity growth (Figure 2). The further a company is above the curve in the base year, the more stringent the percentage intensity reduction required. If the company has a greater growth forecast compared to the sector growth in the pathway, steeper emission intensity reductions will be required. Thus, a company’s particular situation is considered in calculating the emissions intensity target required.

The SDA is used for homogenous sectors that have a dedicated pathway. The cross-sector absolute reduction approach, also referred to as the absolute contraction approach, which requires absolute emissions reductions at a fixed annual rate, can be used by most sectors, especially those that do not have a sector pathway.[4]

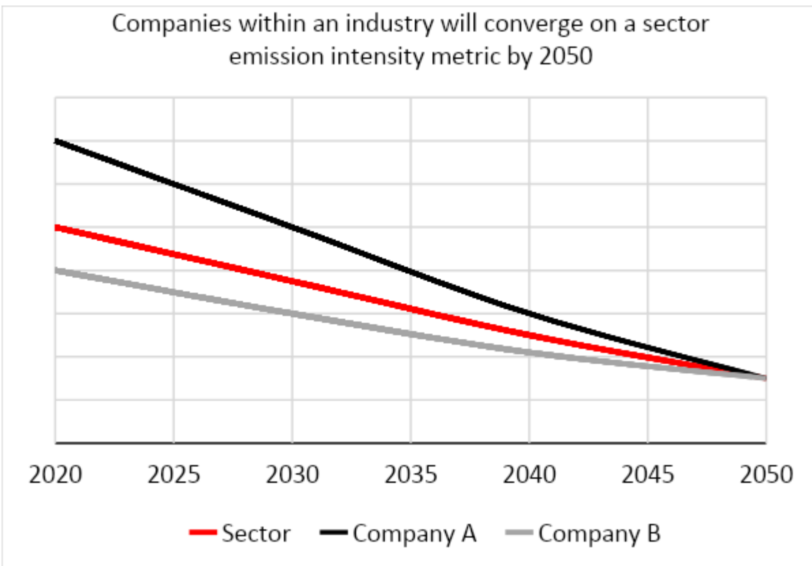


Figure 2: Illustration of an intensity convergence pathway – companies should converge to the sector average intensity (red line) by 2050

Iron & steel core SDA boundary

The iron & steel sector is characterised by varying levels of vertical integration and different types of technology. To ensure that the iron & steel SDA is based on consistent accounting and creates a level playing field for both integrated and non-integrated companies, this guidance provides a standardised iron & steel core SDA boundary, which is aligned with the carbon budget. The iron & steel core SDA boundary can be found in Figure 3 and its justification is discussed in Appendix 3.

[4] See Sectoral Decarbonization Approach Report, 2015 for an explanation of both the absolute contraction method and the SDA.

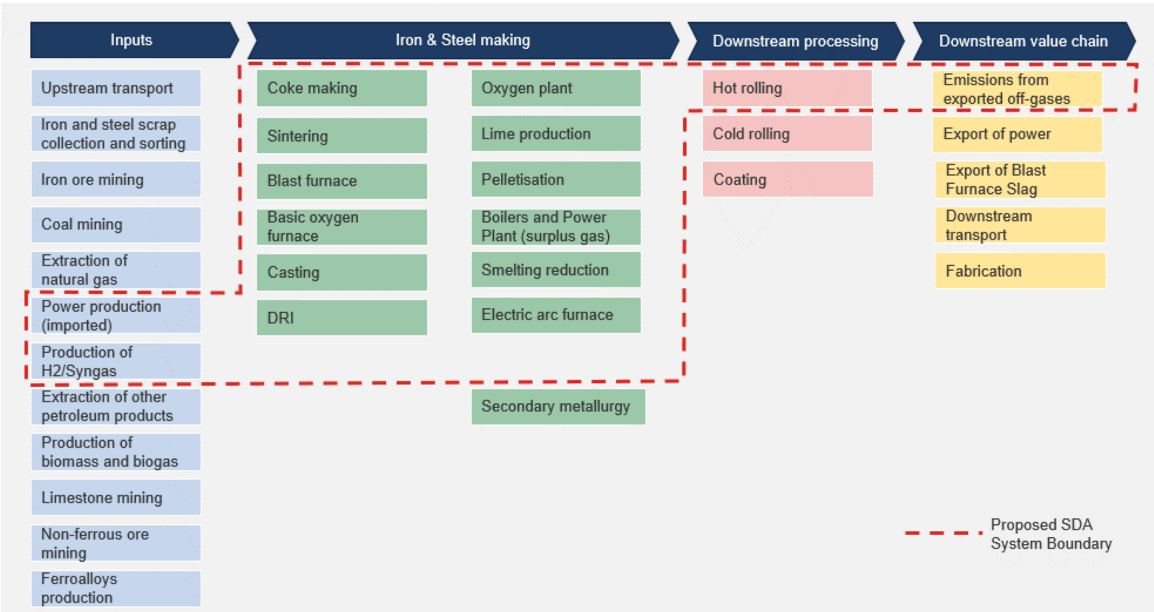


Figure 3: Iron & steel core SDA boundary.

Scrap-input-dependent pathways[5]

To account for the vastly different emission profiles of ore- and scrap-based steelmaking and the fact that steelmakers can change their metallic inputs from year to year, the iron & steel SDA is based on an scrap-input-dependent pathway. This pathway is company specific and is calculated from the company's scrap input and how this changes over time. The pathway is calculated from two separate, fixed, 1.5°C-aligned sector pathways: a 100% scrap-based (secondary) pathway and a 0% scrap-based (primary) pathway. The scrap-input-dependent pathway for a company at a specific scrap ratio will lie at or between the primary and secondary pathways, depending on the ratio between scrap- and ore-based metallics input and how this changes over time. This is the principle of the input-dependent pathway: there are separate pathways for scrap- and ore-based production, and a company producing at, e.g. a 30% scrap and 70% ore will have a pathway between those two. Note that this pathway is not equal to the company's target: it is simply the line the company emissions must progressively converge towards according to the SDA, with company emission intensity meeting the target line in 2050 (Figure 4).

[5] Systems similar to what is described here are often referred to as a "sliding scale". To emphasize that the system derives a 1.5ºC decarbonization pathway that depends on the scrap input, we call it here a "scrap-input-dependent pathway".

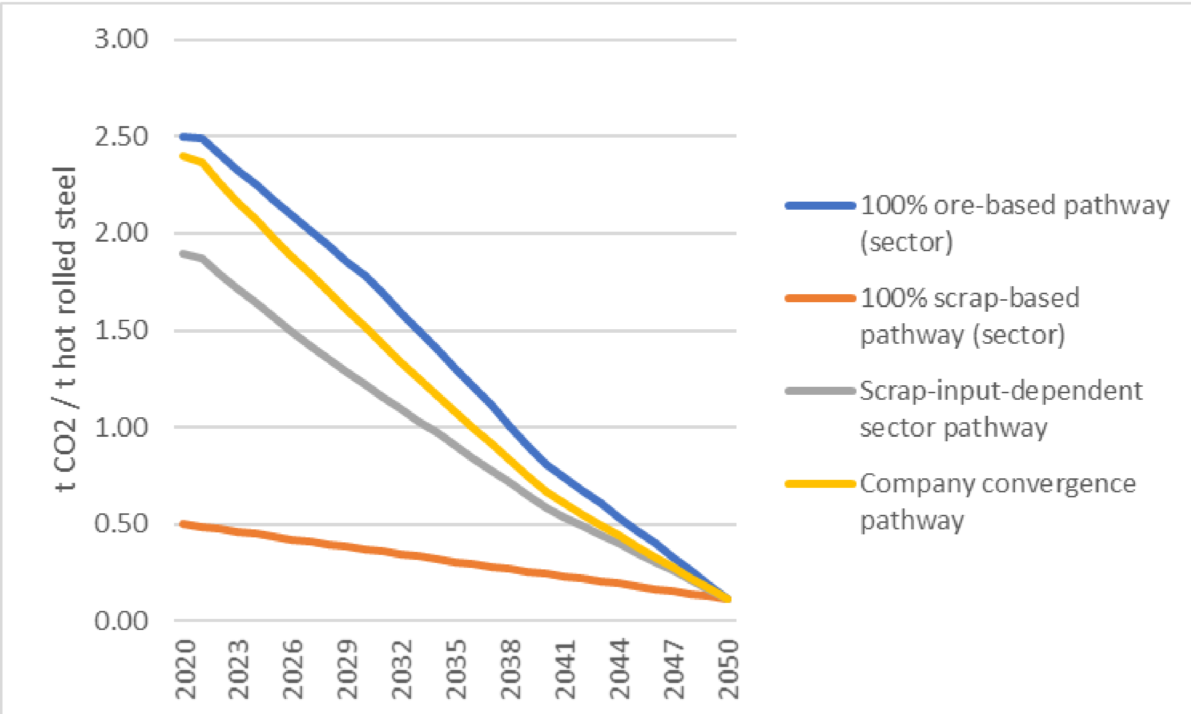


Figure 4: Company targets are calculated from convergence towards a scrap-input-dependent 1.5ºC pathway. (This example is based on a company with 10% activity growth over 2020-30, 2.4 t CO_2 / t hot rolled steel and 30% scrap input in 2020, and 40% scrap input in 2030.)

The target-setting tool accompanying this guidance provides the iron and steel sector intensity pathways to be used with the SDA. Full data can be accessed in the target-setting tool. Details of how the pathways were derived can be found in Appendix I.

Levers to decarbonize iron and steel

Emissions scenarios describing paths for the iron and steel sector to reach the level of deep decarbonization required by the 1.5°C goal point to a wide range of opportunities to reduce emissions.

Many of these opportunities are already being implemented today, such as increasing scrap use and energy efficiency, fuel switching to fossil-free electricity, introducing Top Gas Recycling, or replacing injected coal in blast furnaces with sustainably sourced biofuels. Breakthrough technologies such as green hydrogen, carbon capture and permanent geological storage (CCS), bioenergy with carbon capture and storage (BECCS), smelting reduction, direct electrolysis of molten iron ore, and electrowinning-EAF will also be needed to allow the sector to make significant emissions reductions.

This guidance aims to help companies understand the level of emissions reductions required to align with science but does not prescribe which emissions reduction levers should be prioritized or utilized, as this is up to the individual strategy of each company.

4. SUMMARY OF SECTOR-SPECIFIC CRITERIA AND RECOMMENDATIONS

The below table provides a quick-reference summary of the sector-specific criteria and recommendations discussed in this guidance that apply in addition to the SBTi general and Net-Zero criteria. "C" designates a criterion, i.e. it is mandatory; "R" designates a recommendation.

Topic	Criteria/ Recommendation	Description
Use of system boundary	**Steel-C1**	Where the steel SDA is used for target-setting, the emissions covered shall align with the iron & steel core SDA boundary as defined in this document. The intensity denominator is hot rolled steel.
Limitations in use of steel SDA	**Steel-C2**	The steel SDA may be used for target-setting covering emissions included in the iron & steel core SDA boundary. Other activities, where these make up more than 5% of a company's activities, shall be covered in a separate target calculated using the SBTi's cross-sector methods.
Ambition level of steel SDA	**Steel-C3**	Where the steel SDA is used for target-setting, be it for scope 1, 2 or 3 emissions, the ambition level shall be 1.5°C.

Topic	Criteria/ Recommendation	Description
Disclosure of change in scrap ratio used to calculate near-term targets	**Steel-C4**	Where the steel SDA is used for near-term target-setting, the relative change in the scrap ratio between the base and target year shall be indicated in the target wording.
Required near-term scope 3 coverage: purchased intermediate products	**Steel-C5**	Near-term steel company SBTs shall include at least 95% of suppliers' emissions for purchased intermediate products falling within the core iron & steel SDA boundary, irrespective of whether the share of these emissions compared to the total scope 1, 2, and 3 emissions of the company is above 40%.
Mandatory near-term scope 3 category: upstream fuel- and energy-related emissions	**Steel-C6**	Near-term steel company SBTs shall include a scope 3 target that covers at least scope 3 Category 3 "Fuel- and energy-related emissions not included in scope 1 or scope 2". This shall include all fuel types, including biomass fuels and metallurgical coal, on a cradle-to-gate basis, as well as transmission and distribution losses from purchased electricity according to the GHG Protocol.
Co-products	**Steel-C7**	Avoided emissions due to the use of sold co-products shall not count as an emission reduction towards meeting an SBT.

Topic	Criteria/ Recommendation	Description
Forecast growth	**Steel-C8**	Where the steel SDA is used for target-setting, the company shall provide, in their target submission, justification of the growth projection used to calculate the target, including public or internal documents where growth projections are mentioned if relevant.
Annual emission reporting	**Steel-C9**	As per SBTi general criterion C25, companies shall disclose annually the emissions associated with their targets. This means that where the steel SDA is used for target-setting, annual disclosure of emissions aligned with the boundary of the target is mandatory.
Recommended near-term scope 3 target covering ferroalloys	**Steel-R1**	Stainless or high-alloy steel company near-term SBTs should include a scope 3 target that covers at least scope 3 Category 1 "Purchased goods and services" covering ferroalloys sourcing, irrespective of the share of the total scope 1, 2 and 3 emissions for which they are responsible.
Investment in breakthrough technologies	**Steel-R2**	Steel companies should disclose information such as planned milestones and near-term investments that demonstrate the integrity of commitments to ensure any breakthrough technology required to meet their target ambition will become available in the timeframe expected.

Topic	Criteria/ Recommendation	Description
Information on absolute emissions reductions	**Steel-R3**	In order to demonstrate that intensity targets also lead to absolute emissions reductions, and to demonstrate progress through optimization of material use, companies whose targets are expressed in intensity terms are recommended to publish the absolute emissions reductions that will be achieved by their targets.

5. HOW TO SET A SCIENCE-BASED TARGET

Companies are invited to familiarize themselves with the SBTi cross-sector resources, the SBTi How-To Guide or Net-Zero Getting Started Guide, followed by reviewing the requirements of target setting in the SBTi Criteria and Recommendations or Net-Zero Standard Criteria. To understand these requirements in more depth, companies should then review the Target Validation Protocol and use the target setting tool, and the net-zero tool to begin developing targets.

This section provides additional guidance for companies in the iron and steel sector and its value chain to set SBTs. Four steps are described:

1. **Determine target boundaries, scopes and target setting methods:** Review the generic SBTi criteria and this sector-specific guidance document to determine how to set target(s) across relevant activities and scopes.
2. **Calculate emissions inventory:** Calculate base year and most recent year emissions inventories and activity following guidance provided by the GHG Protocol and below.
3. **Construct targets:** Model SDA target(s) using the SBTi Tools. Additional targets may also be needed to address emissions not covered by the steel SDA to meet the SBTi criteria and can also be modelled with the SBTi Tools.
4. **Submit targets to the SBTi:** Send a completed Target Submission Form to the SBTi.

Step 1: Determine scopes, target boundaries and target setting methods

The following steps should be followed to determine which emissions should be covered by SBTs, and which approaches to use when calculating SBTs.

1. Decide whether to set a near-term target only, or a long-term/net-zero target (which includes a near-term target).
2. Decide on a base year and target year for each target. Near-term targets must have a timeframe of 5-10 years from the date of submission, and the long-term target year must be 2050 or sooner. Rules for this can be found in the SBTi general and Net-Zero Criteria.
3. Determine if a scope 3 target is desired/optional or required. See sector-specific guidance below.
4. Determine which emissions fall inside or outside target boundaries: i.e., which emissions will be included in the iron & steel core SDA boundary according to this guidance, and which other emissions may also be required to be covered by targets according to the SBTi general and Net-Zero Criteria.
5. Determine which target-setting method will be used for each target.

Scopes required

General criteria on the scopes required is set out in the SBTi Criteria and Net-Zero Standard Criteria. In summary:

For near-term targets:

- At least 95% of all Scope 1 and 2 emissions shall be included.
- If a company's relevant scope 3 emissions are 40% or more of total scope 1, 2, and 3 emissions, a scope 3 target is required. The coverage must be at least 67%.
- All companies involved in the sale or distribution of natural gas and/or other fossil fuels shall set 1.5°C-aligned scope 3 targets for the use of sold products, irrespective of the share of these emissions compared to the total scope 1, 2, and 3 emissions of the company.

For long term (net-zero) targets**:**

Scope 1, 2 and 3 shall be included. The coverage shall be at least 95% for scope 1 and 2, and 90% for scope 3.

Additional requirements to these generic rules applying to steel producers are set out in this guidance document, and can be summarized as follows:

1. Steel producers must include at least 95% of their own emissions from activities falling under the iron & steel core SDA boundary in targets, regardless of whether these are scope 1, 2 or 3 emissions.
2. Near-term steel company SBTs shall include at least 95% of their purchased intermediate products emissions falling within the core boundary (i.e., these emissions, which would otherwise be considered scope 3 category 1 Purchased goods and services, must be covered as part of the core target calculated using the SDA)
3. Mandatory scope 3 target for fuel- and energy-related emissions not covered in other targets.

Iron & steel core SDA boundary

How is the boundary to be used?

All processes included in the iron & steel core SDA boundary will fall under the iron & steel SDA target-setting method, irrespective of whether they are scope 1, 2, or 3 emissions for a given entity. Emissions from purchased products, and processing of sold products, falling within the core boundary will also be included.

How must emissions from purchased products be included?

Companies purchasing intermediate products that are included within the iron & steel core SDA boundary shall include emissions from these products in their target boundary.

This measure is introduced not only to reduce the risk of “scope leakage”, in which a company could reduce scope 1 emissions by shifting from producing inputs to purchasing inputs, but also provides a level playing field between integrated and non-integrated players, which may differ only in asset ownership structure rather than processes to make steel.

Therefore, the iron & steel SDA targets shall include at least 95% of emissions from purchased:

1. Coke,
2. Syngas,
3. Hydrogen,
4. Power,
5. Lime,
6. Oxygen,
7. Iron ore pellets or any other form of agglomerated iron ore (i.e., sinter),
8. Hot Briquetted Iron or any other form of iron (i.e., pig iron).

The emissions to be included shall be the scope 1 and 2 emissions of the supplier (i.e. cradle-to-gate emissions of these products are not mandatory to be included in the core boundary, although they may be relevant for scope 3 targets where these are set).

How will emissions from sold intermediate products be included?

For some companies that have a surplus of intermediate products (coke, sinter, pellets, etc) and therefore sell them to other iron & steel companies, the processes used to create those intermediate products fall under the iron & steel core SDA boundary described in Figure 3. These products include:

- Coke,
- Iron ore pellets or any other form of agglomerated iron ore (i.e., sinter),
- Hot Briquetted Iron or any other form of iron (i.e., pig iron).

Therefore companies shall include their own scope 1 and 2 emissions from producing these products in their target based on the core boundary.

The further processing of these products by downstream companies may be set as a separate scope 3 target using the cross-sector methods.

How must emissions outside the boundary be covered in targets?

Emissions outside the iron & steel core SDA boundary will be dealt with according to their scope. For scope 1 and 2 emissions outside the boundary, the company will use one of the SBTi cross-sector methods to set targets.

For scope 3 emissions outside the boundary, general SBTi guidelines stipulate that if a company's scope 3 emissions account for more than 40% of a company's total (scope 1 + 2 + 3) emissions, the company will need to set a near-term scope 3 target (for emissions outside the boundary; emissions inside the boundary are covered with SDA).

For upstream fuel- and energy-related emissions and emissions from purchased fuel and electricity, a scope 3 target shall be set, regardless of their share of the company's total emissions.

An overview of the types of emissions and their recommended target approach has been included in Table 1.

As for all SBTs, the total of emissions covered by the iron & steel core SDA boundary and the cross-sector reduction approach must include at least 95% of a company's scope 1 and 2 emissions. Additionally, the company must ensure that >95% of the emissions within the iron & steel core SDA boundary are included in the iron & steel SDA.

How should co-products be treated in the boundary?

While the recognition of the positive impact of co-products such as off-gases and blast-furnace slag sold to other industries could be worthwhile, it is excluded from the context of SBT-setting to ensure that the iron & steel SBT is aligned with the Greenhouse Gas Protocol Corporate Accounting Standard. As soon as widely accepted cross-sector co-products carbon accounting rules are established, this topic may be revisited and updated accordingly in the context of Beyond Value Chain Mitigation, for example.

How should high-alloy/stainless steel and ferroalloy production and use be treated in the boundary?

Cradle-to-gate emissions for high-alloy steels differ from those from carbon steel for two reasons:

1. There are emissions during production of the ferro-alloys (either upstream or by steel company)
2. In addition, in steelmaking, carbon content of ferro-alloys is released as CO_2 ("process emissions")

As can be seen in Figure 3, ferro-alloy production is excluded from the SDA system boundary, due to the lack of a widely accepted 1.5ºC decarbonisation pathway for ferro-alloy production. Therefore, high-alloy steel producers have two options for setting SBTs:

1. Set scope 1, 2 and 3 targets using cross-sector absolute reduction approaches, at 1.5°C

ambition for for scope 1 and 2, and at least well-below 2°C ambition for scope 3

OR

1. Set a target for steelmaking activities within core boundary using the SDA
2. Set a target for own ferro-alloy production scope 1 and 2 using 1.5°C cross-sector absolute reduction
3. Set a scope 3 target covering cradle-to-gate emissions of purchased ferro-alloys using any of the relevant scope 3 methods
4. (Optional) Convert targets to absolute numbers and combine into one target

Target setting methods

The permitted target-setting methods for scope 1, 2 and 3 emissions are laid out below. The SBTi recommends using the most ambitious method that leads to the earliest reductions and the least cumulative emissions.

Scope 1 & 2

Companies may use the steel Sectoral Decarbonization Approach (SDA) to set scope 1 & 2 targets for steel production within the iron & steel core SDA boundary, and must use the cross-sector absolute reduction approach for scope 1 & 2 targets covering all other processes.

Targets to actively source renewable electricity at a rate that is consistent with 1.5°C scenarios are an acceptable alternative to scope 2 emission reduction targets (see SBTi Criteria).

Scope 3

Scope 3 near-term targets may be set using one of five approaches: Absolute Reduction, Economic Intensity, Physical Intensity Convergence (SDA), Physical Intensity Reduction or supplier engagement.

Scope 3 long-term targets may be set using one of four approaches: Absolute Reduction, Economic Intensity Reduction, Physical Intensity Convergence or Physical Intensity Reduction.

If physical intensity reduction is chosen, an appropriate denominator that is relevant to the target should be chosen. Denominators that are likely to vary significantly with no link to the real decarbonization of the scope 3 category shall be avoided, as this risks giving the impression of progress towards targets where no real effort to decarbonize has been made.

General rules are found in the SBTi Criteria and Net-Zero Standard Criteria.

Limitations in the use of the iron & steel SDA

The iron & steel SDA should be used by companies whose main activity is the production of iron or carbon steel: companies for which >95% of their scope 1 and 2 emissions results from iron- and steelmaking processes falling under the iron & steel core SDA boundary can set a target using only the iron & steel SDA; companies for which 5-95% of their scope 1 and 2 emissions results from iron- and steelmaking processes can use the iron & steel SDA for the share of their emissions that fall under the iron & steel core SDA boundary.

Companies making an iron-bearing sector-specific intermediate product, i.e., Hot Briquetted Iron and pig iron or any potential future form of iron, may also use the SDA for these activities, given that the majority of the sector emissions result from ironmaking.

The iron & steel SDA can be used by stainless steel producers for processes included within the iron & steel core SDA boundary.

How can companies combine the iron & steel SDA with other SBTi target-setting approaches?

The cross-sector absolute reduction approach or other relevant SDA shall be used for target setting for scope 1 and 2 emissions from activities outside the iron & steel core SDA boundary. In Table 1, an overview of the different types of emissions a company can have, and their recommended target setting approach has been included.

Table 1: Overview of emission types and approaches

Emission type	Example	Target setting Approach
Scope 1 emission inside SDA boundary	Emissions from sintering	Iron & steel SDA
Scope 1 emission outside SDA boundary	Emissions from coating	SBTi cross-sector target approach (1.5°C aligned)
Scope 2 emission inside SDA boundary	Emissions from purchased power for EAF	iron & steel SDA
Scope 2 emission for company operations outside SDA boundary	Emissions from purchased power for cold rolling	SBTi cross-sector target approach (1.5°C aligned)
Production of purchased intermediate projects falling inside SDA boundary	Emissions from purchased HBI	Iron & steel SDA
Scope 3 emission outside SDA boundary, non-upstream fuel/energy/metallurgical coal/iron ore related	Emissions from transport of scrap	SBTi cross-sector target approach
Scope 3 emission outside SDA boundary, upstream fuel/energy/metallurgical coal/iron ore related	Methane emissions from natural gas extraction	SBTi cross-sector target approach

A further example of target setting for a company purchasing iron for steelmaking is shown in the Worked Examples section.

Companies wishing to combine or aggregate targets set using different methods (e.g., targets set using the iron & steel SDA and the cross-sector absolute reduction approach), are permitted to do so, under the following conditions:

- Data is submitted for validation that allows the ambition level of each element to be checked separately
- Aggregation is technically feasible, e.g., two different SDA-based targets such as t CO_2/t hot rolled steel and tCO_2 /t cement cannot be aggregated as intensity targets as the denominators are different, whereas two absolute targets could be aggregated into one.
- When intensity targets are converted to absolute targets, it is required to also report the underlying intensity targets or sub-targets.

Step 2: Calculate emissions inventory

In this step, companies should collect data for emissions, production volumes, and scrap ratio for their base year and most recent year, applying the criteria below regarding product definitions, emissions included etc.

All greenhouse gas accounting for target setting shall follow the SBTi Target Validation Protocol, the GHG Protocol Corporate Accounting and Reporting Standard and Corporate Value Chain (Scope 3) Standard.

Which data points are necessary for companies to use the iron & steel SDA?

For setting a target, companies will need to calculate their emissions inventory. This inventory should contain the following data:

- Base year emissions as defined by the iron & steel core SDA boundary
- Base year production (Mt hot rolled steel)
- Target year expected production (Mt hot rolled steel)
- Base year scrap ratio (%)
- Target year expected scrap ratio (%)

Which accounting method should be followed for emissions data collection?

All greenhouse gas accounting for target setting shall follow the SBTi Target validation Protocol, the GHG Protocol Corporate Accounting and Reporting Standard and the requirements set out by this document.

Companies should aim to collect emissions data for purchased products or processes that are included in the iron & steel core SDA boundary directly from the vendor. This emissions data should be based only on the processes included within the iron & steel core SDA boundary.

How should companies determine their scrap ratio?

Three distinct types of scrap are used in the iron & steel industry:

- Home scrap, also known as internal scrap, which is generated during steelmaking, rolling and finishing. This scrap is most often recycled immediately at the same facility it was created.
- Prompt scrap, also known as manufacturing scrap, is generated during the manufacturing of steel products by customers.
- End-of-life scrap, also known as post-consumer scrap, is generated at the end of life of a steel product.

For determining the scrap ratio, two main approaches are used by the iron & steel industry:

1. Counting only externally purchased metallic scrap inputs: the scrap mass is defined as the mass of purchased external scrap minus the mass of sold home scrap. The scrap ratio is determined by dividing the scrap mass by the total of the mass of scrap and the mass of iron ore (corrected for different grades). This method is applied in The Sustainable STEEL Principles[6] drafted by the Center for Climate-Aligned Finance, and by Responsible Steel[7] for their certification.
2. Counting all metallic scrap entering the melt shop: the scrap mass is defined as all scrap inputs entering the melt shop. The scrap ratio is determined by dividing the total scrap mass by the total mass of steel produced. This method is applied in the decarbonisation scenarios laid out by the IEA[8] and the Net-Zero Steel Initiative of the Mission Possible Platform.

To ensure that the projected scrap availability and scrap ratio used in the decarbonisation pathway are aligned with the approach for determining the scrap ratio, companies should determine their scrap ratio based on all scrap entering the melt shop (approach 2).

Step 3: Construct targets

To construct their SBTs, companies should follow these steps:

[6] https://climatealignment.org/wp-content/uploads/2022/06/sustainable_steel_principles_framework.pdf
[7] Responsible Steel includes end of life scrap, manufacturing scrap and home crap, but excludes internal scrap. Internal scrap is defined as scrap from a crude steel making unit that is then recycled within the same unit process.
[8] The IEA NZE does not specify how the scrap ratio is calculated. In their 'Iron & Steel Technology Roadmap', the IEA counts the total scrap available for steel production as the total of home scrap, prompt scrap and end-of-life scrap. We assume the IEA uses the same methodology in NZE.

1. Collect data for production forecasts to the target year.
2. Input the emissions inventory data from the previous steps into the target setting tools to calculate the reductions required for valid targets for scope 1, 2, and 3, following the additional guidance and examples in this guidance.
3. Decide on target wording according to the SBTi submission form and the guidance and examples given in this guidance.

How can the sliding scale be used by different types of iron and steel companies?

Using the sliding scale, companies will construct their own target pathway depending on their scrap use. In Figure 5 below, examples have been included for four distinct types of steel companies. As company targets will always be expressed in terms of relative reduction in emission intensity, the lines in the figure are indexed to the company's base year emission intensity. The required intensity reduction by 2030 for the four types of companies is shown in Table 2.

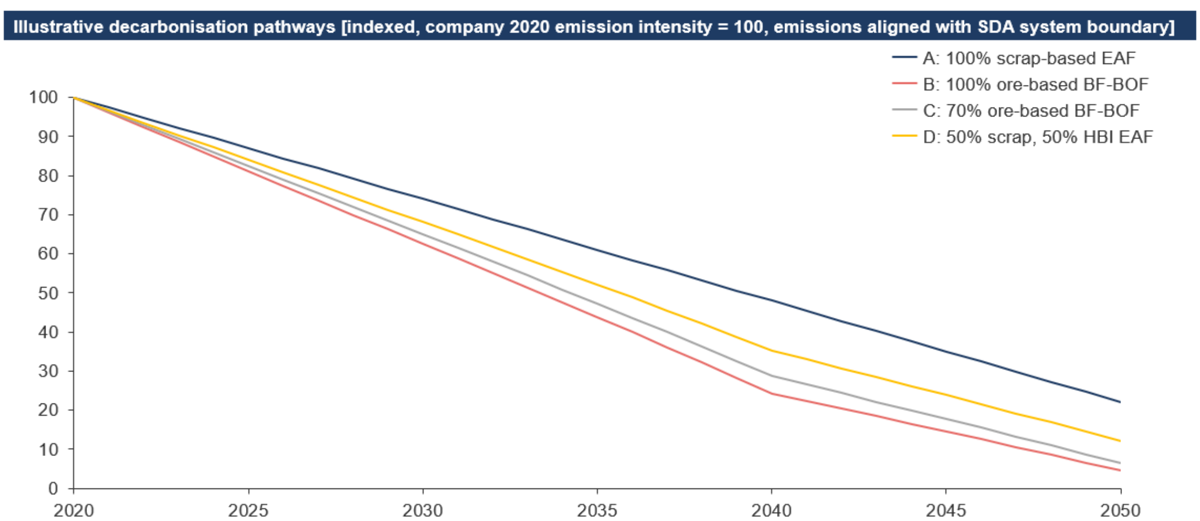


Figure 5: Use of the sliding scale for four different types of steelmaking companies. Based on the IEA NZE pathway, adjusted for the iron & steel core SDA boundary.

Table 2: Use of the sliding scale for four different types of companies. No production growth has been assumed, and reductions are based on the IEA NZE pathway, adjusted for the iron & steel core SDA boundary. These are only examples: see the SBT tool to calculate further cases.

Company	Production type (stable between target year and base year)	Base year (2020) emission intensity (kg CO_2eq/ts)	Required intensity reduction by 2030 vs 2020 (%)
A	100% scrap-based EAF	500	26%
B	100% ore-based BF-BOF	2400	29%
C	70% ore-based BF-BOF	1700	29%
D	50% scrap, 50% HBI EAF	900	28%

What happens to the target in case of feedstock change?

Changes in emissions which happened only due to changes in feedstock (i.e., replacing coal with green hydrogen) do not trigger recalculation. However, as the calculated target depends on both the base and target year scrap input, for transparency and robustness it is necessary to include this information in the target wording. If this were not the case, a company could calculate unambitious targets by assuming a minor increase in their scrap share, and then use increasing scrap to meet the target. Therefore, target wording must include a sentence indicating the change in scrap share over the target timeframe, such as "The scrap share associated with this target increases 1.2 times over the target timeframe".

For reference, and so that external stakeholders can quickly understand how scrap share change over time affects the reduction needed in a target, Table 3 shows examples of relative intensity reduction targets for the timeframe 2020-2030 for different base and target year scrap share. Further examples can be calculated in the tool.

Table 3 Examples of relative intensity reduction targets for different base and target year scrap shares. These examples were calculated on the basis of 2.4 tCO2/t base year emissions intensity, and no growth; companies in different situations will have different targets.

	Base year scrap share										
Target year scrap share	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0%	29%										
10%	34%	29%									
20%	40%	35%	29%								
30%	45%	41%	35%	29%							
40%	51%	47%	42%	36%	29%						
50%	57%	53%	49%	44%	37%	29%					
60%	62%	59%	56%	51%	46%	39%	29%				
70%	68%	66%	63%	59%	54%	48%	41%	29%			
80%	74%	72%	69%	66%	63%	58%	52%	43%	30%		
90%	79%	78%	76%	74%	71%	68%	63%	57%	47%	30%	
100%	85%	84%	83%	81%	80%	78%	75%	70%	64%	53%	32%

Using the target setting tools

Near-term target-setting tool

The 1.5°C iron and steel pathway is integrated into SBTi's near-term target-setting tool. The tool contains instructions for how it should be used.

Selecting the correct growth rate in the tool

The near-term target tool offers two options to input a company's growth rate/activity projection as part of the target calculation: "fixed market share", where the company's percentage change in output over the target timeframe is assumed to be the same as the rate associated with the global pathway, or "target year output", where the company must input its own projected output for its target year. Care should be taken to choose the correct option, as growth rate relative to the global rate will affect the intensity target calculated. If the company's growth is expected to be different from the global rate associated with the pathway, the "target year output" option should be chosen.

(For reference, the global growth from 2020 to 2030 when "fixed market share" is chosen for the 1.5°C steel pathway is 8.8%. To find the rate for other timeframes, select the desired timeframe in the tab "SBT tool". The growth rate will be shown in tab "Calculations".)

Long-term target-setting tool

The long-term target tool is found here and contains instructions for calculating long-term targets.

Examples of target calculation and wording

Target wording example

"Company X commits to reducing scope 1, 2 and 3 GHG emissions covered by the iron & steel core SDA boundary by 35% per tonne of hot rolled steel by 2030 from a 2020 base year. The scrap share associated with this target increases 1.5 times over the target timeframe"

"Company X also commits to reducing all other scope 1 and 2 GHG emissions by 42% over the same timeframe."

"Company X further commits to reducing scope 3 GHG emissions from fuel- and energy-related emissions 25% over the same timeframe"

Further worked examples to be added after consultation

Step 4: Submit targets to the SBTi

Companies should follow the general SBTi guidelines for submitting a target for validation. The following sections include some additional criteria and recommendations for steel companies.

Ensuring near-term targets contribute to long-term progress

Long-term steel decarbonisation roadmaps rely on breakthrough technologies such as CCS and green hydrogen that do not yet exist at scale before 2030. Because of this, during the first few years of the steel SDA, it might be possible for companies to comply with the SDA and be validated without any plan to invest in breakthrough technologies, effectively postponing decarbonisation measures. There is a credibility issue in claiming such targets are science-based. Therefore, for those companies to remain on track in the long term, there should be a mechanism in place that ensures short-term investments are aligned with the long-term net zero target.

To deal with the risks described above, steel companies submitting near-term or long-term targets are encouraged to provide additional qualitative evidence that demonstrates the integrity of commitments to prepare for implementing new technology as part of a plan to reach net-zero. Such evidence could include:

- Published R&D spend in breakthrough technologies.
- Assessment of "readiness for net-zero" by other third party initiatives, such as ACT.

Justification of projected growth

In the target setting tools, there are two options for companies to project their activity in the target year, either fixed market share (assuming company's activity in line with the market share) or entering their target year output. Correct growth projection is important to ensure that absolute emissions do not exceed the carbon budget. The SDA calculation includes a correction to the emissions intensity pathway if a company's growth forecast is greater than that by the industry as a whole, so faster-growing companies must reduce their emissions intensity faster.

Therefore, companies submitting targets shall provide justification for the growth forecast used in their target submission, including public or internal documents where growth projections are mentioned if relevant.

As an alternative and voluntary safeguard, companies may wish to make public the absolute emissions that their intensity target would lead to, so that stakeholders can see that it leads to absolute reductions.

Updating a target

When a company changes the target-setting methods used compared to its previous targets, they shall demonstrate that the ambition level (in terms of both the relative reduction in absolute and intensity emissions, and target-year emissions level) of the new targets are more ambitious than the company's targets previous to the update. This increased ambition shall be clearly evident to stakeholders reading the target wording.

Box 1: What counts to meet an SBT?

This guidance document provides criteria and recommendations to help companies in the steel sector and its value chain set near- and long-term SBTs that are aligned with a 1.5°C ambition. It does not go into details about the decarbonization levers that may be used to achieve targets, as these will be up to each individual company's strategy.

All decarbonization levers that lead to an emissions reduction in scope 1, 2 and/or 3 according to the SBTi criteria and GHG Protocol accounting rules are valid. These may include increasing scrap use and energy efficiency, by fuel switching to fossil-free electricity, introducing Top Gas Recycling, replacing injected coal in blast furnaces with sustainably sourced biofuels as well as breakthrough technologies such as carbon capture and permanent geological storage (CCS) and bioenergy with carbon capture and storage (BECCS)[9].

[9] SBTi Criteria shall be followed with regard to bioenergy accounting.

Box 2: Carbon capture and use (CCU)

Carbon capture and use (CCU) might contribute to reducing the accumulation of GHGs in the atmosphere at the point of capture. However, CCU applications are not yet fully covered by GHG accounting methods as questions surrounding the permanence of CO_2 sequestration, allocation of emissions savings between different actors, and capture and transport efficiency, amongst others, are not yet settled. Depending on the permanence of storage and the allocation of the savings, different types of CCU would be classified as either an emission reduction or Beyond Value Chain Mitigation. Where CCU is not considered an emission reduction towards meeting an SBT (due to its non-permanence, or due to a sharing of the CO_2-saving benefit between different entities), CCU could still be a relevant form of Beyond Value Chain Mitigation, whereby the benefit of having captured CO_2 for later use is allocated to the capturing company through unique credits, for example. As these emissions reductions or avoidance occur ex-post, industry participants are expected to participate and contribute to future technical discussions and research on defining best practices to appropriately account for these measures.

Use of steel SDA by upstream and downstream companies

Upstream iron ore suppliers and hydrogen producers

Iron ore suppliers can use the Steel SDA to set their scope 3 Category 10 (processing of sold products) target, but the ambition level would be 1.5C aligned. Alternatively, they can use the other scope 3 target setting methods (please refer to Table 4 for more details).

Hydrogen and syngas producers cannot use steel SDA as they produce sector-agnostic intermediate products. Other scope 3 methods should be used (Table 4) unless they can prove their products are solely (>95%) used in manufacturing of iron and steel.

Downstream companies (e.g. construction and automotive companies)

Emissions from the manufacturing of steel may be a relevant source of scope 3 emissions for companies in other sectors, such as the automotive and construction value chain. The steel SDA, rather than the generic scope 3 methods, may be used for scope 3 target setting where the emissions concerned are from the manufacture of steel. However, as reduction of the use of steel can be a key lever for reducing scope 3 emissions for these types of companies, target-setters should ensure the target-setting method reflects this. Therefore, a scope 3 absolute target may be more appropriate, and provide companies more levers to reduce emissions, than an intensity target. For companies using the steel SDA to set their scope 3 emissions target, the ambition level shall be 1.5°C aligned. Table 4 shows a summary of the target setting methods and ambition levels for these upstream and downstream suppliers.

Table 4 Target setting methods for upstream and downstream companies

Activities	Target-setting methods	Ambition
Iron ore supplier	Iron & Steel SDA	1.5°C
	Other scope 3 methods ● Cross-sector absolute reduction (2.5% reduction) ● Physical intensity (7% annual reduction) ● Economic intensity (7% annual reduction) ● Supplier engagement	Well below 2°C
Hydrogen producer (considered as sector agnostic products)	Cannot use the Iron & Steel SDA unless they can prove their products are solely used for the iron and steel producers ● Use other scope 3 methods	Well below 2°C
Automaker, construction company (purchased steel)	● Iron & Steel SDA	1.5°C
	Other scope 3 methods ● Cross-sector absolute reduction (2.5% reduction) ● Physical intensity (7% annual reduction) ● Economic intensity (7% annual reduction) ● Supplier engagement	Well below 2°C

Future sector-specific guidance, such as for the buildings sector, may prohibit the use of the steel SDA for scope 3 target-setting if it is deemed not appropriate due to the importance of demand reduction.

Worked Examples

1. Primarily ore-based steelmaker

Producer with the following characteristics:

- Base year: 2020
  - Activity: production of 10Mt of hot rolled steel
  - Scrap ratio: 10%

- Target year: 2030
  - Forecast activity: production of 10Mt of hot rolled steel
  - Forecast scrap ratio: 10%

This producer carries out all the activities within the iron & steel core SDA boundary itself, and these activities make up over 95% of its total scope 1 and 2 emissions. Therefore, this company can use the iron & steel SDA for the entirety of its own activities. These emissions amount to 24 Mt CO_2e.

Section 1. Input data		
Target setting method	Sectoral Decarbonization Approach	*Select method*
SDA scenario	SBTi 1.5C	
SDA sector	Iron and steel - core boundary	*Select a sector*
Base year	2020	*Select a base year*
Base year | Activity output	10,000,000	*Tonnes of hot rolled steel*
Base year | Emissions within the core boundary	24,000,000	*tCO2e (Emissions intensity: 2.4 tCO2/t)*
		tCO2e
Target year	2030	*Select a target year*
Target year | Type of activity projection	Target year output	*Dropdown*
Target year | Activity output	10,000,000	*Tonnes of hot rolled steel*
Most recent year (MRY)	2020	*Select most recent year of available emissions&activity data*
Scrap ratio in base year	10%	*%*
Scrap ratio in target year	10%	*%*

Results: emissions intensity reduction of 28.6%.

In addition, this producer must set a scope 3 target for category 3. This includes all cradle-to-gate emissions for extraction and production of fossil fuels, as well as transmission and distribution losses of purchased electricity. These amount to 2Mt CO_2e. The producer chooses the Absolute Contraction Approach to set this target at ambition level well-below 2°C.

Section 1. Input data		
Target setting method	Absolute Contraction Approach	*Please review the latest version of the SBTi Guidance and Criteria*
Base year	2020	*Dropdown*
Target year	2030	*Dropdown*
Base year output		
Target year output		
Scope 3 emissions (total or specific categories)	2,000,000	*tCO2e*

Section 2. Absolute Contraction Approach	Base year (2020)	Target year (2030)	% SBT reduction
Company | Scope 3 emissions - WB2C (tCO2e)	2,000,000.0	1,500,000.0	25.0%

Target wording:

Company X commits to reducing scope 1 and 2 GHG emissions covered by the iron & steel core SDA boundary by 28.6% per tonne of hot rolled steel by 2030 from a 2020 base year. The scrap share associated with this target remains the same over the target timeframe.

Company X also commits to reducing scope 3 GHG emissions from fuel- and energy-related emissions 25% over the same timeframe.

2. Primarily scrap-based steelmaker

Producer with the following characteristics:

- Base year: 2020
  - Activity: production of 10Mt of hot rolled steel
  - Scrap ratio: 70%
- Target year: 2030
  - Forecast activity: production of 10Mt of hot rolled steel
  - Forecast scrap ratio: 70%

This producer uses the EAF production route, and so needs to include its own activities falling within the iron & steel core SDA boundary, but also the emissions from production of purchased intermediate products falling within the iron & steel core SDA boundary, which in this case is mostly HBI. These emissions are 7.2 Mt CO_2e for the purchased iron, and 3Mt CO_2e for electricity. These emissions make up over 95% of its total scope 1 and 2 emissions. Therefore, this company can use the iron & steel SDA for the entirety of its own activities.

Section 1. Input data		
Target setting method	Sectoral Decarbonization Approach	*Select method*
SDA scenario	SBTi 1.5C	
SDA sector	Iron and steel - core boundary	*Select a sector*
Base year	2020	*Select a base year*
Base year | Activity output	10,000,000	*Tonnes of hot rolled steel*
Base year | Emissions within the core boundary	10,200,000	*tCO2e (Emissions intensity: 1.02 tCO2/t)*
		tCO2e
Target year	2030	*Select a target year*
Target year | Type of activity projection	Target year output	*Dropdown*
Target year | Activity output	10,000,000	*Tonnes of hot rolled steel*
Most recent year (MRY)	2020	*Select most recent year of available emissions&activity data*
Scrap ratio in base year	70%	%
Scrap ratio in target year	70%	%

Results: emissions intensity reduction of 27.4%.

In addition, this producer must set a scope 3 target for category 3. This includes all cradle-to-gate emissions for extraction and production of fossil fuels happening outside the iron & steel core SDA boundary (so it includes cradle-to-gate emissions for the fuels used in the production of the purchased HBI), as well as transmission and distribution losses of purchased electricity. These amount to 0.9 Mt CO_2e. The producer chooses the Absolute Contraction Approach to set this target at ambition level well-below 2°C.

Section 1. Input data			
Target setting method	Absolute Contraction Approach	*Please review the latest version of the SBTi Guidance and Criteria*	
Base year	2020	*Dropdown*	
Target year	2030	*Dropdown*	
Base year output			
Target year output			
Scope 3 emissions (total or specific categories)	900,000	*tCO2e*	
Section 2. Absolute Contraction Approach			
	Base year (2020)	**Target year (2030)**	**% SBT reduction**
Company | Scope 3 emissions - WB2C (tCO2e)	900,000.0	675,000.0	25.0%

3. Company with higher activity growth

This producer is identical to Example 1, but its production grows from 10Mt to 12 Mt hot rolled steel over the target timeframe. Result: emissions intensity reduction target of 34.8%.

Target wording: Company X commits to reducing scope 1 and 2 GHG emissions covered by the iron & steel core SDA boundary by 34.8% per tonne of hot rolled steel by 2030 from a 2020 base year. The scrap share associated with this target remains the same over the target timeframe.

4. Company where scrap share changes

This producer is identical to Example 1, but its scrap ratio grows from 10% to 20% over the target timeframe. Result: emissions intensity reduction target of 34.7%.

Target wording: Company X commits to reducing scope 1 and 2 GHG emissions covered by the iron & steel core SDA boundary by 34.7% per tonne of hot rolled steel by 2030 from a 2020 base year. The scrap share associated with this target increases 2 times over the target timeframe.

6. GLOSSARY

BECCS - Bioenergy, carbon capture and storage

CCU - Carbon capture and use

CCS - Carbon capture and storage

GHG - Greenhouse gas

IEA - International Energy Agency

IPCC - United Nations Intergovernmental Panel on Climate Change

SDA - Sectoral Decarbonization Approach

SBT - Science-based target

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APPENDIX 1: DEVELOPMENT OF PATHWAYS

Global carbon budget and its allocation to the sector

The SBTi published an assessment of possible 1.5⁰C emissions scenarios for all sectors in its Pathways to Net-Zero: SBTi Technical Summary (2021). This reviewed estimates of the remaining emissions budget, top-down mitigation scenarios, and sectoral studies to determine 1.5⁰C-aligned pathways at the global and sectoral level. According to the IPCC, the remaining budget to limit global warming to 1.5⁰C with a 50% probability is about 500 GT of CO_2 (IPCC 2021). In aggregate, 1.5⁰C-aligned pathways used by the SBTi stay within the 500 GT carbon budget and reach net-zero CO_2 at the global level by 2050, under the assumption of at least 1-4 GT CO_2 removal per year by 2050. Within this framework, the SBTi developed a cross-sector emissions corridor that covers CO_2, CH_4, and N_2O emissions from energy supply, buildings, industry and transport based on published studies and expert judgement.

The Pathways to Net-Zero: SBTi Technical Summary determines that the range of 1.5⁰C-aligned cumulative 2020-2050 direct emissions for steel in the literature is 20-40 GT CO_2. Therefore, emissions scenarios with these cumulative direct emissions (or lower) could be considered as a potential scenario for 1.5⁰C SBT-setting by the SBTi.

Choice of emissions scenarios for 1.5⁰C

Emissions scenarios for SBT-setting should meet the criteria of plausibility (credibility of narrative), responsibility (reduced risk of not meeting the 1.5⁰C goal), objectivity (not biassed towards any particular industry or organization) and consistency (they should have a strong internal logic)[10].

Several organisations have created decarbonisation pathways for the iron & steel Industry. The most well-known 1.5°C aligned pathways include the IEA's Net Zero Emissions scenario (IEA, 2021), the Global Steel Facility Level Net-Zero Steel Pathways by IDDRI (IDDRI, 2021), The One Earth Climate Model (OECM, 2020 & 2022) and the Mission Possible Project's Sector Transition Strategy for iron & steel (Carbon Cost scenario) (MPP, 2021).

We have reviewed seven pathways describing scenarios for the iron & steel sector to reduce emissions[11]. These pathways include a wide range of opportunities available to the iron & steel sector to transform its processes towards near-net zero steel production, often coupled with demand-side measures such as lightweighting and creating more durable products. The sector can realise initial emission reduction by increasing scrap use and energy efficiency and by switching to fossil-free electricity for mainly electricity-based processes such as EAF production. Decommissioning sintering

[10] For more details, see: Foundations of Science Based Target Setting

[11] The seven pathways were (not all are 1.5°C aligned): Net Zero by 2050 (IEA, 2021), 1.5°C Steel (E3G & PNNL, 2021), Global Facility Level Net-Zero Steel Pathways (IDDRI, Bataille et al., 2021), Net-Zero Steel Sector Transition Strategy (MPP, 2021), Sectoral Pathways to Net Zero Emissions (OECM, ISF 2020), Limit Global Warming to 1.5°C (OECM, ISF 2022), Energy Technology Perspectives (IEA, 2017)

plants in favour of pelletizers, introducing Top Gas Recycling, and replacing injected coal in blast furnaces with sustainably sourced biofuels (i.e., wood charcoal) and electrolytic hydrogen can also serve as intermediate solutions. However, to eliminate the major share of emissions, implementation of breakthrough technologies, such as using exclusively electrolytic hydrogen as a reductant or applying CCS with high capture rates, becomes crucial. The reviewed pathways agree that investments in unabated BF-BOF production need to cease sooner rather than later, because of the long investment cycles in the industry.

After the analysis of the different pathways, the iron & steel SDA was based on the IEA NZE scenario due to the fact that it aligns with the SBTi's principles for the choice of scenarios: plausibility, responsibility, objectivity and consistency.

The IEA Net Zero by 2050 report

The IEA Net Zero By 2050 report (IEA, 2021) was developed to show an achievable pathway for the global energy sector and selected sectors to achieve net zero emissions by 2050. The pathway includes the Iron & Steel sector, providing global direct CO_2 emissions on a 10-year increment between 2020-2050. This emissions pathway has been included in Figure 6.

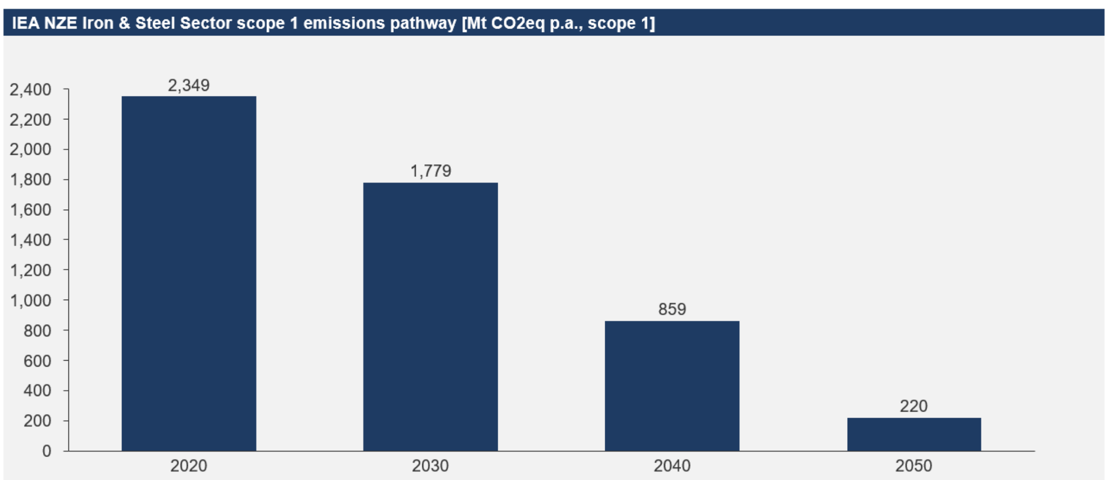

Figure 6: Scope 1 emissions pathway for iron & steel sector as included in IEA Net Zero By 2050.

On which key assumptions was the scenario built?
The IEA NZE assumes growth in steel demand to slow down: between 2020-2030, the sector will grow at a CAGR of 0.8%, and between 2030-2050 at 0.1%, resulting in 2050 steel demand of 1987 Mt. Steel demand data is included for 2020-2050 on a 10y-basis, which has been displayed in Figure 7.

On the production side, the NZE assumes a significant increase of scrap use: scrap as share of input climbs from 32% in 2020 to 46% in 2050. The IEA also expects a radical technological transformation of iron and steel production. Technologies such as scrap-based EAFs, H2-based DRI, iron ore electrolysis and further electrification of processes will shift a large share of energy use from coal to electricity.

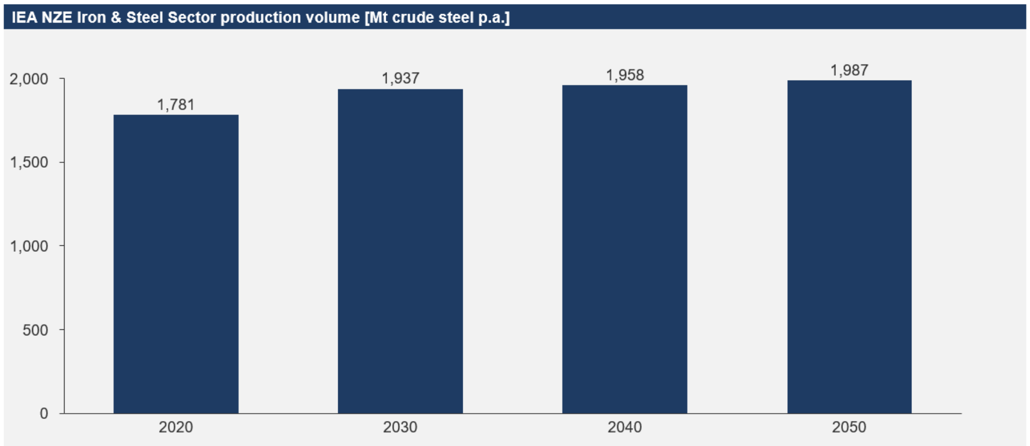

Figure 7: Expected production volumes of steel as included in IEA Net Zero by 2050 .

Are the data points necessary for setting a SDA available?

Two elements are crucial to set a science-based emission intensity target for the Iron and Steel sector: i) annual emissions data for all elements in the iron & steel core SDA boundary, and ii) annual steel demand data. Both are not (directly) included in the IEA NZE report. Below, an overview of the available and necessary data points has been included.

1. *Annual emissions data for all elements in the iron & steel core SDA boundary*

- The IEA NZE includes scope 1 emission data on a 10-year basis. This data can be linearly interpolated to obtain annual scope 1 emissions for the iron & steel sector. IEA allocates emissions from off-gases exported from steel plants to the power sector, even if conversion to electricity happens in power plants integrated with steel plants.
- The IEA NZE does not include data on the iron & steel sector's scope 2 emissions: these are aggregated in total power sector emissions. It is possible to estimate scope 2 emissions, if the following data points are available:
  - The annual split between primary and secondary production – NZE provides this for 2020, 2030 and 2050, but not annually.
  - The annual split of production technologies – NZE provides the share of H2-DRI-EAF, iron ore electrolysis-EAF, CCUS-equipped processes, hydrogen-based processes and 'conventional routes' for 2020, 2030 and 2050. However, an exact split in technologies is missing: both 'CCUS-equipped processes' and 'conventional routes' could include several types of production technology.
  - The energy consumption assumptions for each type of technology (including purchased and self-generated electricity). Combined with the annual production per technology, these could be used to estimate scope 2 emissions. However, the IEA NZE does not include these assumptions.

2. *Annual steel demand data*

Steel demand is included for 2020-2050 on a 10y basis. To use the data for the SDA, annual demand can be estimated through linear interpolation of the available data points.

Adjustments made to align the IEA NZE pathway with the iron & steel core SDA boundary

The IEA NZE only includes direct (scope 1) emissions from the iron & steel sector, while the iron & steel SDA includes all emissions included in the iron & steel core SDA boundary. To adjust for this, we have adopted an approach developed by RMI (RMI, 2022), who estimated the scope 2 emissions in five steps outlined below. The final emissions pathway following from these calculations is depicted in Figure 8.

1. **The steel production share per technology** was estimated. Table 3.3 (pg. 129 in IEA NZE - IEA, 2022) provides values for H2 DRI-EAF, Electrolysis and CCUS-based production for 2020, 2030 and 2050. These data points have been included in Table 5. The IEA mentions all other steel is made through Scrap-based EAF or 'traditional' production. We assume traditional production to be BF-BOF and DRI-EAF.

   To estimate the share of scrap-based EAF production, the annual total scrap fraction (IEA NZE table 3.3, pg. 129) was reduced by the scrap used in primary production routes. The remaining scrap was assumed to be used in scrap-based EAF, resulting in the scrap-based EAF production share. Technology assumptions on the scrap use of different primary routes were based on average values and the IEA iron & steel Technology Roadmap (IEA, 2020). An overview of these technology assumptions can be found in Table 6.

   Scrap ratio in all primary steelmaking technologies has been assumed to be 11% after discussion with experts, which allowed us to calculate the share of pure 100% scrap-based EAF production. Subsequently, 2040 values were interpolated. The results of this exercise have been included in Table 7.

Table 5: Overview of production shares included in original IEA data

Production share	Original IEA data, % of annual primary production		
	2020	2030	2050
H2-DRI-EAF	0%	2%	29%
Electrolysis	0%	0%	13%
CCUS	0%	6%	53%
Traditional (BF-BOF and DRI-EAF)	-	-	-
Scrap-based EAF	-	-	-

Table 6: Technology assumptions used to determine scope 2 emissions for iron & steel production.

Technology Assumptions	Purchased Electricity (kWh/t)	Self-Generated Electricity (kWh/t)	Scrap Feed Fraction (%)
H2 DRI-EAF	1,694	0	11%[12]
Electrolysis	3,361	0	11%
CCUS	1,944	0	11%
Traditional (BF-BOF and DRI-EAF)	108	219	11%
Scrap-based EAF	622	0	100%

Table 7: Overview of production shares after adjustments

Production Share	Adjusted IEA Data, % of annual production			
	2020	2030	2040	2050
H2 DRI-EAF	0%	1%	10%	17%
Electrolysis	0%	0%	4%	8%
CCUS	0%	4%	19%	31%
Traditional (BF-BOF and DRI-EAF)	80%	67%	32%	3%
Scrap-based EAF	20%	27%	34%	41%

2. **The purchased electricity and the associated emissions** per tonne of steel were estimated. Technology assumptions on the amount of electricity purchased per steel production route (kWh/t), as included in table below were multiplied by the production technology shares. The emissions from purchased electricity were calculated by multiplying purchased electricity by the annual grid emission factor (table A.5 pg. 200 IEA NZE).

	2020	2030	2040	2050
Grid Emissions (kg CO_2/MWh)	438	138	-1	-5
Purchased electricity (kWh/t steel)	211	352	941	1,416
Purchased electricity emissions (t CO_2/t steel)	0.09	0.05	0.00	-0.01

[12] Assumed equal with current average use

3. **The self-generated electricity** per tonne of steel was estimated by multiplying technology assumptions on the amount of self-generated electricity per steel production route (GJ/t) by the production technology shares.

	2020	2030	2040	2050
Self-generated electricity (kWh/t steel)	234	147	70	6

4. **The emissions from self-generated electricity** were then calculated. First, an emission factor for self-generated electricity from off-gases was calculated. It was assumed off-gas consists for 30% of Coke Oven Gas, and for 70% of BF gas. The emission factor for both gas types was obtained from the EPA emission factors (44.4 kgCO_2/GJ gas for Coke Oven Gas and 260 kg CO_2/GJ gas for BF gas) (EPA, 2022). The off-gas emission factor was calculated by multiplying the off-gas components by the off-gas emission factors, and factoring in an assumed efficiency of electricity production from off-gas, which was assumed to increase from 37% across the whole 2020-2050 period.

   The emissions from self-generated electricity were then calculated by multiplying the amount of self-generated electricity per year by the emission factor for self-generated electricity.

	2020	2030	2040	2050
Efficiency (GJ gas/GJ electricity as %)	37%	37%	37%	37%
Overall emission factor (t CO_2/MWh electricity)	1.9	1.9	1.9	1.9
Self-generated electricity (kWh/t steel)	234	147	70	6
Self-gen. electricity emissions (t CO_2/t steel)	0.44	0.28	0.13	0.01

5. **Total scope 2 emissions** were calculated by summing the emissions from purchased and self-generated electricity.

	2020	2030	2040	2050
Scope 1 emission intensity (t CO_2/t steel)	1.32	0.92	0.44	0.11
Scope 2 emission intensity (t CO_2/t steel)	0.54	0.33	0.13	0.01
Total emissions intensity (t CO_2/t steel)	1.86	1.25	0.57	0.12
Total steel production (Mt)	1,781	1,937	1,958	1,987
Total scope 1 emissions (Gt CO_2)	2.35	1.78	0.86	0.22
Total scope 2 emissions (Gt CO_2)	0.96	0.63	0.26	0.01
Total emissions from steelmaking (Gt CO_2)	3.3	2.4	1.1	0.2

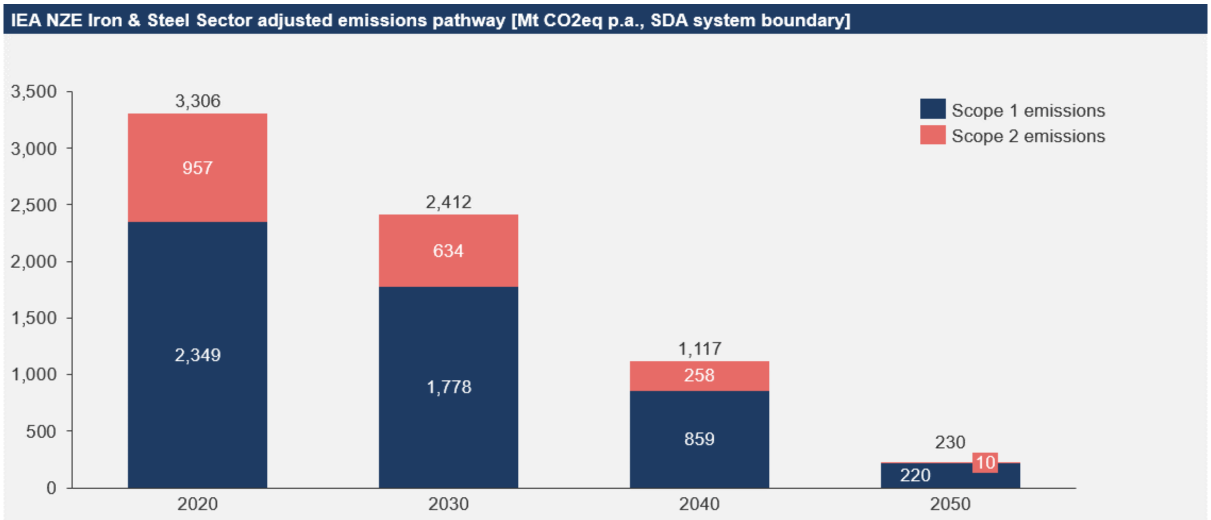

Figure 8: IEA NZE iron & steel emissions pathway including adjustments for scope 2 emissions.

Justification of adjustments to the carbon budget

The adjustments made to the carbon budget do not increase the risk of the pathway not being 1.5°C-aligned; the IEA counts all iron & steel sector scope 2 emissions towards the emissions from the power sector, which are also modelled to reduce in a 1.5°C aligned way. In total, no new emissions are added to the budget, they are just shifted from the power sector towards the iron & steel sector.

The total budget for the iron & steel core SDA boundary aligned emissions pathway is 54.8 Gt, including the adjustments outlined in this appendix.

Justification for allocation of scope 2 emissions to steel

The allocation of the scope 2 emissions budget according to the approach by RMI explained above is justified for the following reasons:

- The electricity use is in line with the IEA 1.5ºC scenario
- It takes into account the different emissions factors of off-gases (from coke oven, basic oxygen furnace, blast furnace) and purchased electricity from the grid
- Self-generated electricity using off-gases has a steeper decline than that predicted in the IEA NZE report on the % of traditional BF-BOF and DRI-EAF routes
- The % of self-generated electricity in relation to the total electricity generation decreases all the way through to 2050 and the decrease in emissions is steeper than that of grid electricity (Figure 9). In 2040, there are emissions of around 200 Mt CO_2 from self generated electricity as IEA still assumes there will be 32% BF-BOF after 2040.

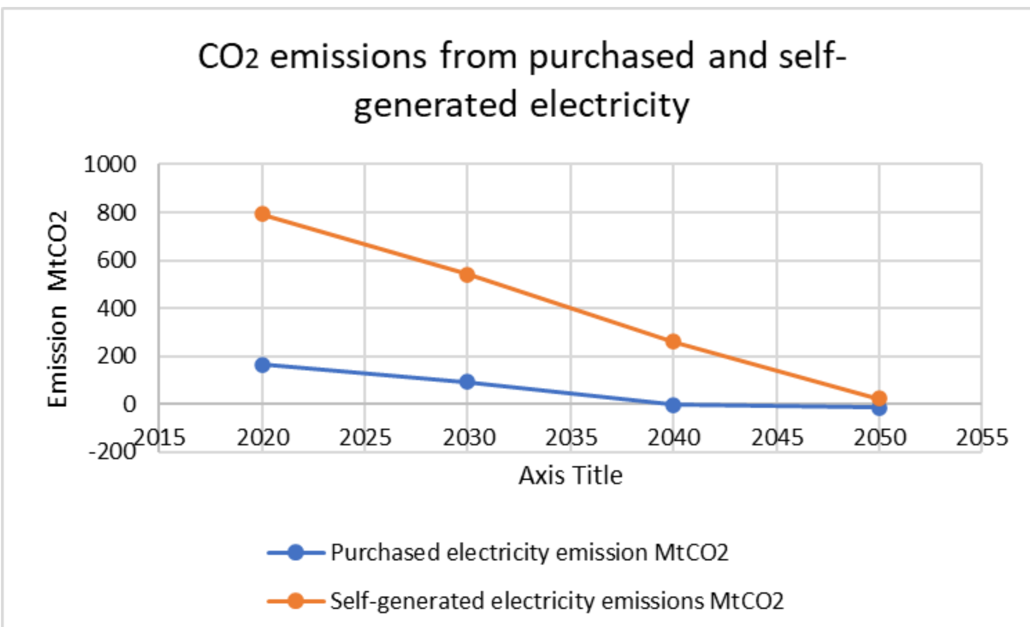

Figure 9: CO_2 emissions from purchased and self-generated electricity from 2020 to 2050

APPENDIX 2: HOW WAS THE SECTOR 1.5ºC PATHWAY DISAGGREGATED INTO TWO PATHWAYS?

Reasons for and against scrap-input-dependent pathways (or "sliding scale")

The system proposed in this guidance provides a different decarbonisation pathway depending on whether the steelmaking in question is primarily ore-based or scrap-based. This concept has been the subject of much discussion but we are confident that this is a preferable system to a single pathway, for two main reasons:

- A single pathway leads to targets for primary-based producers that can be achieved by increasing the scrap input alone, which means there is no incentive to reduce the carbon intensity of primary steelmaking, which is the really challenging part;
- A single pathway puts little pressure on scrap-based producers to reduce emissions, and yet emissions from these production routes are far from negligible today.

Some reasons for why a single pathway might be preferable are put forward below, with a response as to how these concerns are addressed by the proposed system.

Reasons for a single pathway	Response
"If the disaggregated pathways are not calibrated well, they fully neutralize any benefit to shifting to using more scrap, and therefore the shift to more circularity needed in the sector as a whole will not materialize."	The pathways have been calibrated carefully so that while they partially neutralize the effect of scrap to encourage decarbonization of ore-based production (discussed above), they nevertheless do encourage a generalized increase in scrap use in the sector for two reasons: the shape of the scrap-based curve means that as a company moves towards this by increasing its scrap, minimum target ambition decreases; and levers available for decarbonizing scrap-based production are "easier" than for ore-based, and so pressure to decarbonize will always incentivise a general move towards these production routes.

"The disaggregated pathways lead to comparison of primarily ore-based producers and primarily scrap-based producers that are unfair, because the ore-based producer is "allowed" a much higher emission intensity."	SBTs are not intended to be used for product comparisons or company intensity comparisons. SBTs are expressed as a relative reduction in emissions over a timeframe, and are individual to each company based on their starting emissions and activity growth.
"A higher-intensity ore-based path gives ore-based producers a 'free pass' to continue business as usual."	The ore-based path requires even steeper near-term emissions reductions than the scrap-based path, in relative terms.

Development of pathways

The SDA calculation methodology was adjusted slightly to incorporate the sliding scale. The target emission intensity of a company is calculated using several parameters, including *d* - the difference between the company's CO_2 intensity in the base year and the CO_2 intensity (t CO_2e/t steel) of the sector in target year 2050 (SI_2050), P_y - the sector progress in year y and m_y - the market share parameter in year y. More information and exact formulas for the calculation of an SDA can be found in 'Sectoral Decarbonization Approach (SDA)' by SBTi (2015)[13].

In order to incentivize a move towards scrap-based production, the 2050 intensity target was assumed to be the same for scrap-based and ore-based production (~116 kg CO_2 / t hot rolled steel), which is different from other applications of the sliding scale.

How were the 100% ore-based and 100% scrap-based target emission pathways established?

For constructing the primary- and secondary emission pathways used in the SDA – it is crucial to set the right starting points. The method for constructing the sliding-scale 100% scrap- and 100% ore-based pathways is as follows:

- Select a reputable, 1.5°C aligned emissions pathway for the iron & steel sector, and use it to establish expected annual steel demand and scrap consumption, current - 2050
- Establish current and 2050 100% scrap-based steelmaking emission intensity, and determine the intensity reduction trajectory (the steeper it is, the less incentive to use scrap)

[13] The SDA outlined in this document is based on a 2°C-aligned emissions reduction, but share the same calculation methods

- Multiply scrap consumption by scrap-based steelmaking emission intensity to arrive at annual scrap-based steelmaking emissions
- Deduct annual scrap-based steelmaking emissions from the total emissions pathway for all iron & steel production, the result is the 100% ore-based emissions pathway

In this method, the selection of an emission intensity pathway for 100% scrap-based steelmaking is key to ensuring the right behaviour is promoted. The scrap-based steelmaking pathway should find the balance between:

- Sufficiently ambitious emissions intensity targets to incentivise both primary and secondary steelmakers to decarbonise
- Sufficiently lenient emissions intensity targets to incentivise steelmakers to increase their scrap ratio, and not punish high scrap ratios with stricter targets

For finding the right 100% scrap-based emission intensity pathway, we have experimented with basing the starting (current year) emission intensity on:

1. The median emission intensity of 100% scrap-based EAF producers (~500 kg CO_2e / t hot rolled steel): this will result in 50% of scrap-based producers above the starting emission intensity, making the target a bit more attainable for different types of EAF producers.
2. The 80th percentile of emission intensity of 100% scrap-based EAF producers (~790 kg CO_2e / t hot rolled steel[14]): this will result in only 20% of current scrap-based producers above the starting emission intensity, but a steeper trajectory towards the convergence emission intensity in 2050. This will also result in a stricter trajectory for primary steelmakers, because a commensurately smaller share of the sector's total carbon budget will be available for ore-based steelmaking

Results from this analysis indicate that a higher secondary emission intensity starting point actually results in a steeper emissions reduction slope and thus in stricter targets for scrap-based producers. Based on that, the median emission intensity (~500 kg CO_2e / t hot rolled steel) as the 2020 emission intensity starting point for secondary producers is recommended.

To ensure the right balance between primary and secondary decarbonization measures, we recommend that the pathways are constructed in such a way that they converge towards equal emission intensity by 2050. When the (adjusted) IEA NZE pathway is used, this results in a 2050 emission intensity of ~116 kg CO_2e / t hot rolled steel for both production routes. This convergence of 2050 emission intensity was not based on our belief that emission intensity will actually be the same in 2050, but it was used to 'flatten' the secondary pathway slightly, ensuring more lenient targets for primarily scrap-based producers, encouraging a shift towards more circularity.

[14] Based on RMI analysis 'The Sustainable STEEL Principles: Alignment Zone Briefing'

APPENDIX 3: DEVELOPMENT OF THE IRON & STEEL CORE SDA BOUNDARY

The iron & steel core SDA boundary was designed to include the material sources of emissions to enable all types of iron and steel makers to set SBTs and to ensure a level playing field for them when they come under scrutiny of their stakeholders.

Inclusion of hot rolling: The iron & steel core SDA boundary includes the steps generally required for burden[15] and reductant preparation, iron ore reduction and steelmaking up to and including hot rolling. The production of hydrogen, syngas and all power[16] are included in the iron & steel core SDA boundary. The boundary has been set based on the assumption that it covers the largest sources of emissions in the steel industry while also covering the process steps shared between most steel products. Almost every steel product will go through the steps required to make hot rolled steel, in contradiction to downstream processing steps (i.e., galvanisation or cold rolling), which can differ significantly per product and per company. Second, emissions from hot rolling are substantial. Third, one of main sources of variation in hot rolling emissions is whether a company uses blast furnace off-gases as fuel there or not. Since off-gases are an important part of integrated steelmaking's carbon footprint, hot rolling has to be included to make sure the boundary enables consistent treatment of off-gases irrespective of where in the plant they are used. Figure 3 displays the iron & steel core SDA boundary.

Upstream fuel- and energy-related emissions and emissions from the extraction of iron ore and metallurgical coal are not to be included in the iron & steel core SDA boundary. The emissions from metallurgical coal extraction will likely be dominated by fugitive methane emissions, which might introduce a large uncertainty to the emissions pathway and budget. However, it will be mandatory to set a separate scope 3 target for these emissions. Other upstream emissions, such as transport and iron and steel scrap collection and sorting, have not been included in the iron & steel core SDA boundary because of their likely immateriality compared to other sources of emissions. More detail on the treatment of these upstream emissions is included in the iron & steel core SDA boundary section.

Additionally, the boundary only includes the steps required for the production of conventional carbon steel. Secondary metallurgy steps (i.e., vacuum induction melting, vacuum degassing, charging of alloying elements, etc.) whose main purpose is adjusting the quality of steel[17] are excluded from the core boundary because not all steel products will be treated using these processes. That does not mean no target is required for these emissions: target-setting for processes outside the boundary is discussed in the iron & steel core SDA boundary section.

[15] The furnace charge of iron ore pellets and/or sinter, coke and flux
[16] Including both purchased power and auto-generated power
[17] Steps as Vacuum Induction Melting are used i.e., for the production of high-quality specialty steels.

Comparison of the core iron & steel core SDA boundary with other existing boundaries and reporting methods

Overall, companies setting an SBT will report in agreement with the GHG Protocol Corporate Accounting Standard (GHGP). The iron & steel core SDA boundary can also be related to other iron & steel emission pathways and reporting efforts, as has been done in Figure 10 for the sources of emissions that vary the most between the different system boundaries compared.

The system boundary suggested by the NZS PMP (NZS PMP, 2021)[18], is similar to the iron & steel core SDA boundary, with the exception of the exclusion of emissions from biomass and biogas production and ferroalloys production, and the inclusion of hot rolling. The iron & steel core SDA boundary closely matches the Responsible Steel Standard boundary (ResponsibleSteel, 2022), with the exception of the inclusion of hot rolling for the SDA, and the inclusion of upstream emissions for Responsible Steel. When compared to the World Steel Association CO_2 Data collection system (WSA, 2021), the iron & steel core SDA boundary includes fewer downstream emissions: WSA includes cold rolling and coating. Another key difference is that the WSA only collects CO_2 data, and does not include other GHG emissions.

The iron & steel core SDA boundary closely matches the IEA[19] "crude steel" system boundary (IEA, 2022) for near zero emission steel production, with the exception of upstream emissions from fossil fuel supply, which the IEA includes. The iron & steel core SDA boundary is broader than the boundary used in the IEA Net Zero by 2050 model (IEA, 2021), which only includes scope 1 emissions for iron and steelmaking. All scope 2 emissions are counted towards the power sector by the IEA.

This boundary will be used to compare emissions at company level, and it will not interfere in site-level reporting required by governments or industry associations. These reporting schemes will be used to reduce the administrative burden where possible, i.e. by providing reference values for purchased products within the iron & steel core SDA boundary.

[18] The Net Zero Steel Pathway Methodology Project has made recommendations on developing guidance for steelmakers who wish to make a commitment to a net zero or SBT.

[19] As proposed by the IEA in "Achieving Net Zero Heavy Industry Sectors in G7 Members (2022).

✓ Emissions included in system boundary ✗ Emissions not included in system boundary

Emissions	SDA	WSA	IEA NZE-direct	IEA NZE-indirect	IEA Achieving Net Zero Heavy Industry (G7)	Responsible Steel	NZS PMP crude steel boundary
Extraction, processing and transportation of material inputs	✗	✗	✗	✗	✓[1]	✓	✗
Emissions from extraction/processing of fuels/reductants	✗	✓	✗	✗	✓	✓	✗
Credits for electricity emissions exported	✗	✓	✗	✗	✗	✓	✓
Credits for slag exported	✗	✓	✗	✗	✓	✗	✗
On-site generation of electricity and steam	✓	✓	✗	✓	✓	✓	✓
Off-site generation of electricity	✓	✓	✗	✓	✓	✓	✓
Off-site generation of heat	✓	✓	✓	✗	✓	✓	✓
Hot rolling	✓	✓	✓	✗	✗	✗	✗
Production of inputs for ferro-alloys (e.g., stainless steel)	✗	✓	✗	✗	✗	✗	✓

1) Only extraction and processing of iron ore, limestone supply and and fossil fuel supply are included.

Figure 10: Comparison of the iron & steel core SDA boundary and other efforts' boundaries, on the 9 items that show the largest differences. Note that not all elements included in the system boundary are compared.

Mandatory targets outside the iron & steel core SDA boundary

Why are targets mandatory for upstream fuel- and energy-related emissions?

- Upstream methane emissions are substantial – for a 100% ore-based BF-BOF they can make up ~15% of the scope 1 + 2 + 3 emissions. Setting a mandatory scope 3 target will ensure sufficient attention is given to reducing these emissions and emphasises the role the iron & steel sector can play in this reduction by pulling it into the boundary of the industry.
- Including these upstream emissions in the core boundary, and expanding the carbon budget to account for this, would be risky as the magnitude is uncertain and it would not necessarily put the focus on reducing the most critical emissions. Therefore, targets covering these emissions are mandatory, but are kept as a separate scope 3 target.
- Requiring a separate target for upstream emissions will facilitate improvement of upstream data quality, especially that on methane emissions, which are not as well understood as CO_2.