SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Partner organizations

CDP DISCLOSURE INSIGHT ACTION

UN GLOBAL COMPACT

WORLD RESOURCES INSTITUTE

WWF

The SBTi Net-Zero Manual & Criteria

Version 1.0, for public consultation

September 2021

Version	Release date	Purpose	Updates on earlier version
1.0, Corporate Manual	15.07.2021	Road test	-
1.1, Corporate Manual	23.07.2021	Road test	Clarification on 5–10-year timeframe for near-term SBTs, timeline updates, minor updates to spelling and grammar, minor updates to Appendix III.
1.0, Corporate Manual & Criteria	20.09.21	Public consultation	Significant updates to include further clarifications and include Net-Zero Criteria.

Contents

Part 1: Background

1.1 Background to the SBTi's Net-Zero Standard

According to the 2018 report by the Intergovernmental Panel on Climate Change (IPCC), to limit global warming to 1.5°C above pre-industrial levels and avoid the most catastrophic impacts of climate change, the world must halve CO_2 emissions by around 2030 and reach net-zero CO_2 emissions by mid-century. Moreover, to reach a state in which human-caused greenhouse gas (GHG) emissions no longer contribute to global warming means preventing the accumulation of *all* GHGs in the atmosphere, which the Paris Agreement calls to achieve in the second half of the century.

Recognising the importance of keeping global warming to 1.5°C, companies are increasingly adopting net-zero targets. While the growing interest in net-zero targets represents an unparalleled opportunity to drive corporate climate action, it also creates the pressing need for a common understanding of "net-zero" in a corporate context, as existing targets vary widely in boundaries, definitions, timeframes, and mitigation strategies used.

To avoid confusion and inconsistent claims that potentially undermine the credibility and impact of corporate net-zero targets, a science-based framework is needed to translate the growing momentum behind net-zero targets into action over the near and long-term consistent with achieving climate stabilization.

1.2 The Net-Zero Standard development process

Recognising that the definition of net-zero and the path to get there is often inconsistent, the Science Based Targets initiative (SBTi) began developing the Net-Zero Standard to provide business leaders with a common, robust, and science-based understanding of net-zero. The SBTi is undertaking this stakeholder-informed process to develop the Net-Zero Standard to enable companies to set robust and credible net-zero targets in line with a 1.5°C future. There are many frameworks available for companies to make net-zero commitments, including the SBTi's Business Ambition for 1.5°C campaign, however the SBTi's Net-Zero Standard is the first global science-based standard to guide companies in setting net-zero targets.

The SBTi is undertaking a robust, inclusive, and transparent consultation with stakeholders to ensure that companies can be confident their actions are in line with climate science. The framework is being developed through consultations with the SBTi's Scientific and Technical Advisory Groups, and a dedicated Net-Zero Expert Advisory Group (EAG). Our EAG includes balanced representation from academia, civil society, science, and business. The EAG is the main consensus building body for the Net-Zero Standard. Members' main role is to review and provide in-depth feedback to the SBTi during development of our Standard.

The SBTi aims to ensure that corporate net-zero targets, which are commitments to reach a state of no impact on the climate from GHG emissions, are consistent, robust, and aligned with the ambition of the Paris Agreement. As explained in detail in *Foundations for Science-based Net-Zero Target Setting in the Corporate Sector*, this objective implies two conditions:

1. Achieving a scale of value chain emissions reductions consistent with the depth of abatement at the point of reaching global net-zero in pathways that limit warming to 1.5°C with no or low overshoot.
2. Neutralising the impact of any source of any residual emissions by permanently removing an equivalent volume of atmospheric CO_2.[1]

Both conditions – deep emission reduction and neutralisation of residual emissions with permanent carbon removal – must be met by net-zero targets. In the transition to net-zero, the companies must prioritise emission reductions, but the SBTi also encourages companies to go beyond their science-based targets to take action to mitigate emissions outside their value chain.

Following on from the publication of the 'Foundations for net-zero target setting in the corporate sector' paper in September 2020, the SBTi has been developing detailed criteria and guidance. A public consultation on the first version of draft criteria was open for comments for two months and closed on 12th of March, 2021. We received almost 400 responses to our consultation, the results of which are included in a Public Consultation report.

A company road test ran from Thursday the 15th of July to Tuesday the 31st of August 2021. 84 companies from a diverse range of sectors and geographies took part in the road test. The primary objectives for the road test were to:

- Gather feedback on the clarity, robustness and practicality of the target setting tool, criteria and guidance
- Identify key challenges for adoption and implementation of the standard across industries
- Build a strong network of companies on the journey to setting net-zero targets in line with climate science

Companies were expected to trial the target setting tool and review the criteria and guidance documents, and then provide input via a feedback survey. A report will be published on our website soon with the outcomes of the company road test. The road test helped us make refinements to the Net-Zero Standard in advance of this public consultation.

1.2.1 Pre-Launch Public Consultation

Due to the importance of and interest in corporate net-zero target setting, the SBTi is conducting a second public consultation on the Net-Zero Standard. This is the final touch point with external stakeholders before the launch of Version 1 of the Net-Zero Standard, which is planned for the 28th of October 2021.

The aim of this public consultation process is largely to seek input from external stakeholders on the clarity of the Net-Zero Standard materials, understand the level of support for the SBTi's

[1] Residual emissions are emissions sources that remain unabated by the time net-zero is reached at the global or sector level in 1.5˚C mitigation pathways with low or no overshoot (*Foundations for Science-based Net-zero Target Setting*, pp. 7, 32-34). For most companies this requires emission reductions of at least 90%, which implies neutralisation of no more than 10% of base year emissions when reaching net-zero.

direction of travel, and engage directly and indirectly with external stakeholders to build additional support and identify areas of improvement.

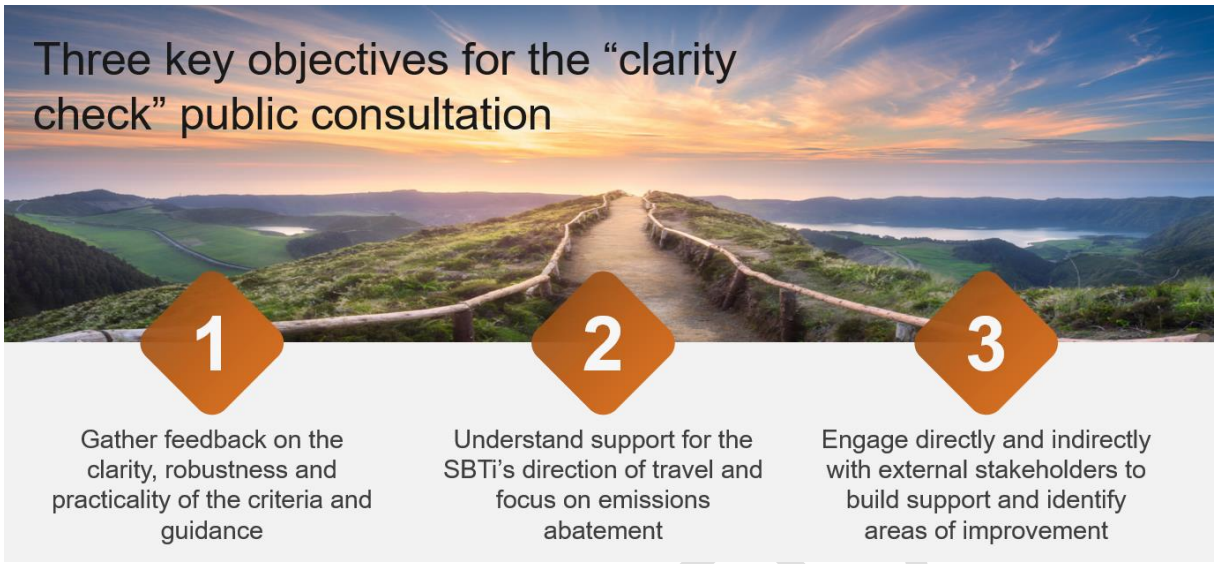


Figure 1 Three key objectives for the "clarity check" public consultation.

The Net-Zero Tool has not been released as part of this consultation as we plan to make updates to the preliminary pathways that were included in the version that was released as part of the company road test. We expect to release this tool in January 2022 when the SBTi begins validating net-zero targets.

We encourage all interested parties to review this document, as well as the "How-to Guide" and provide input via the feedback survey. The public consultation is open for input until October 6, 2021.

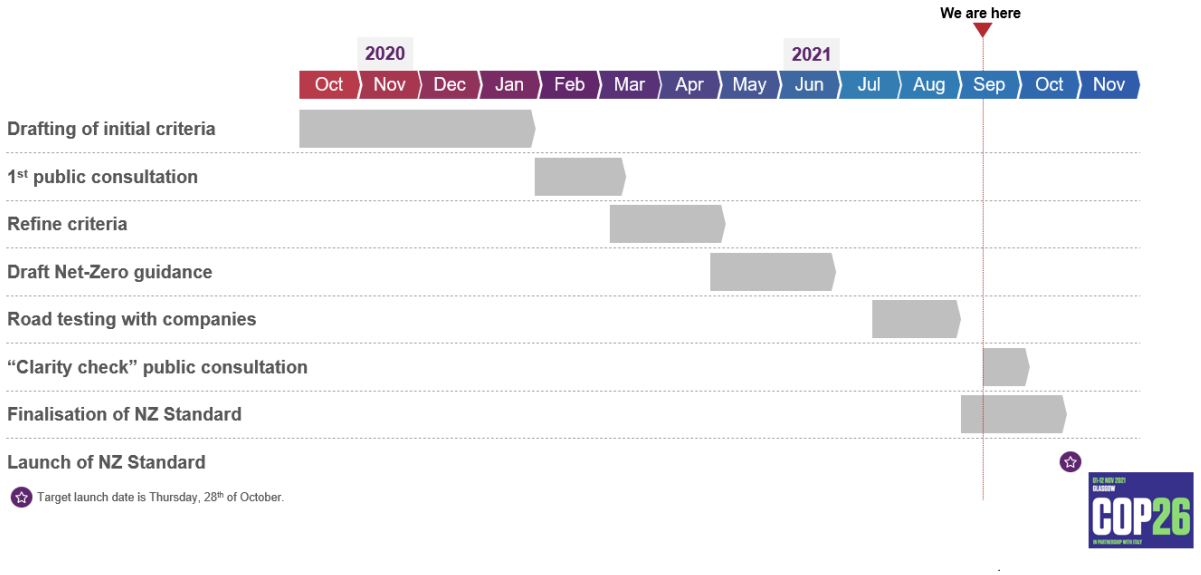


Figure 2 Net-Zero Standard project timeline

1.3 The SBTi is undertaking further work to understand its role in incentivising beyond-value chain mitigation

The principle at the heart of the SBTi Net-Zero Standard is the "mitigation hierarchy." Effectively this means that companies should set science-based targets, both near- and long-term, to reduce their value chain emissions and implement strategies to achieve these targets before taking actions or making investments to mitigate emissions outside their value chains (see Figure 3). Despite this, the SBTi recommends that companies that are already investing in a variety of mitigation actions beyond working on their science-based targets (SBTs) continue to do so.

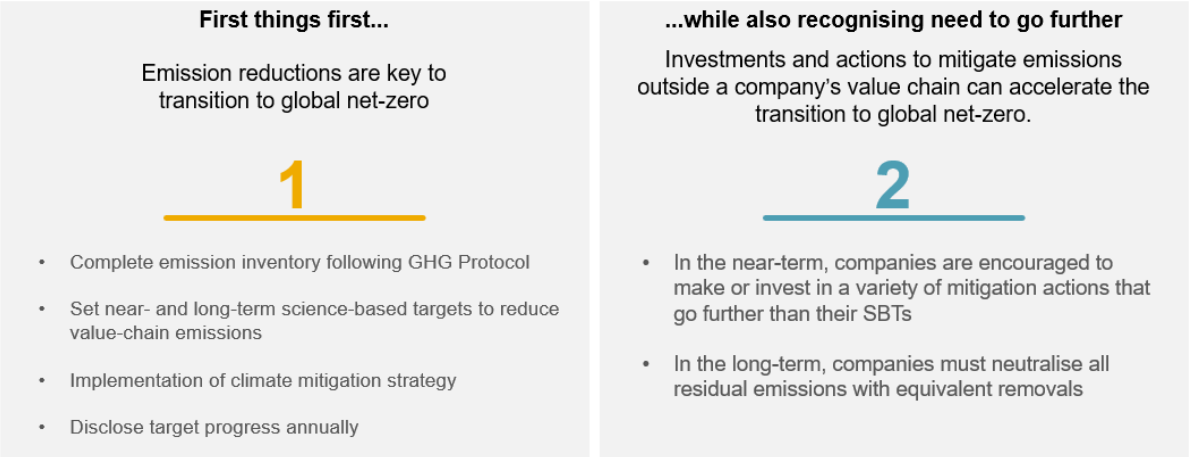


Figure 3 SBTi perspective on prioritisation of mitigation actions.

The SBTi recognises that there is an urgent need to scale up near-term climate finance and we are undertaking research to understand what our role in incentivising these investments should be. While achieving net-zero means deep cuts in emissions followed by neutralising residual emissions with removals, a company's pathway to achieving net-zero can, and often should, include additional actions or investments that mitigate GHG emissions beyond those covered by their near-term and long-term science-based targets to help advance climate action outside the company's value chain. Examples include purchasing high-quality, jurisdictional REDD+ credits that support countries achieving their nationally determined contributions or direct air capture (DAC) and geologic storage.

The SBTi is currently conducting further research to inform its approach which will continue in collaboration with the Net-Zero Expert Advisory Group.

Given that the requirement to neutralise residual emissions for long-term science-based targets is further into the future, SBTi would conservatively advise companies to wait on further guidance before developing neutralisation strategies. Before further guidance is released on neutralisation, companies should prioritize near-term target abatement actions and then beyond value chain actions toward securing and enhancing carbon sinks (terrestrial, coastal and marine, etc.) and developing and expanding removals technologies.

1.3.1 How does this differ in the Forests, Land and Agriculture sector?

Companies with significant forest, land, or agriculture (FLAG) emissions in their value chains should set separate SBTs that cover land-based emissions and carbon removals. Companies who choose this approach can then engage in a variety of mitigation activities to meet their science-based targets that include removals (e.g., stopping deforestation and land conversion). It is important to note that FLAG SBTs are separate from SBTs that cover emissions from energy and industrial processes; consequently, FLAG mitigation cannot be used to meet non-FLAG targets (e.g., a company cannot bring forests into its value chain to meet another SBT).

Currently the GHG Protocol is developing new guidance for corporate land use and removals accounting and, in parallel, the SBTi is developing specific science-based target setting methods for companies with land sector emissions. The new guidance on accounting and target setting for land-based emissions will provide companies with the opportunity to factor in land sector emissions and reduction opportunities into their net-zero strategies. This will become mandatory in the SBTi for companies in land-intensive sectors starting in September 2022.

For more information on the FLAG sectors, see Appendix 3: Further guidance for companies with significant FLAG emissions.

1.4 About this document

This document provides information to companies on how to set emission reduction targets as part of a net-zero commitment aligned with science. This manual will be updated and published when the Standard is launched based on feedback received throughout the public consultation.

The document serves as an accompaniment to the Net-Zero Tool[2] and Net-Zero Getting Started Guide. It is split into six parts and laid out as follows:

- Part 1: Background
- Part 2: Terminology and updates to current SBTi criteria
- Part 3: Mitigation pathways in the Net-Zero Standard
- Part 4: Setting near-term and long-term science-based targets
- Part 5: Net-Zero Criteria & Recommendations
- Part 6: Next steps

The intended audience for this document is companies with over 500 employees that wish to commit to net-zero through the SBTi. These documents cover corporate net-zero targets and do not cover net-zero targets for financial institutions. The SBTi's financial sector project is developing specific net-zero resources for financial institutions. The SBTi will also develop a simplified net-zero approach for SMEs in advance of Standard launch.

SBTi has published several other documents on target setting and net-zero[3]. This guidance complements these existing documents. This document also addresses topics that are described in further detail in other SBTi publications, like the Foundations for Science-Based Net-Zero Target Setting in the Corporate Sector paper and the SBTi Corporate Manual. This guidance and the SBTi's other publications provide a comprehensive suite of information for companies interested in setting science-based targets.

[2] The Net-Zero Tool has not been released in this public consultation as the SBTi is updating sector pathways and integrating the Net-Zero Tool with the SBTi Tool. This is expected to be released in January 2022.
[3] More information on the SBTi's Net-Zero project can be found on our website at https://sciencebasedtargets.org/net-zero.

Part 2: Terminology and updates to current SBTi criteria

2.1 Terminology within the Net-Zero Standard

Since publication of the first draft of Net-Zero Criteria, the SBTi has been going through a process of refining and clarifying the terminology used within the standard. As part of this process, "interim science-based targets" have been renamed as "near-term science-based targets" and we have included a more specific term - "long-term science-based targets" - for emission reduction targets in line with net-zero.

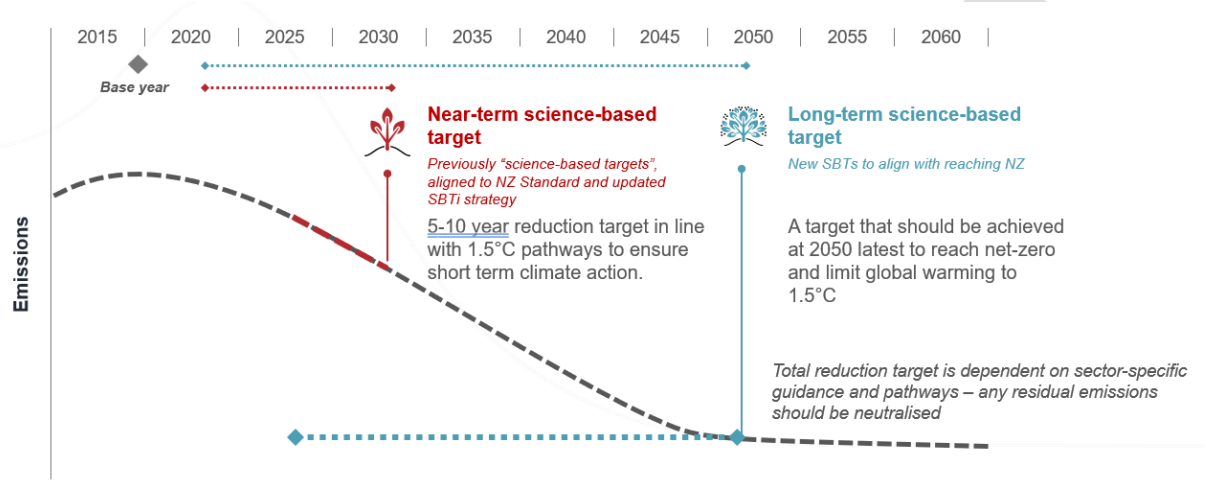


Figure 4 Near-term SBTs vs. long-term SBTs

2.1.1 Near-term science-based targets

- **What**: Previously known as "science-based targets" (or "interim science-based targets in the first draft of Net-Zero Criteria), these are 5-10 year emissions reduction targets in line with 1.5°C pathways.
- **Why**: Near-term SBTs galvanise the action required for deep emissions reductions to be achieved by 2030. Deep near-term emissions reductions are critical to not exceeding the global emissions budget and are not interchangeable with long-term targets[4].

2.1.2 Long-term science-based targets

- **What**: These targets show companies how much they must reduce value chain emissions to align with reaching net-zero at the global or sector level in 1.5°C pathways. A company cannot claim to be net-zero until the long-term SBT is achieved.
- **Why**: These targets drive economy-wide alignment and long-term business planning to reach the level of global emissions reductions needed for climate goals to be met based on science.

[4] Despite this, if a company sets a long-term science-based target to reach the level of decarbonisation required to reach net-zero at the global or sector level in 1.5°C pathways within a 10-year timeframe, the near-term science-based target is not required.

2.1.3 Net-zero targets

- **What**: Setting corporate net-zero targets aligned with meeting societal climate goals means:
    1. Achieving a scale of value chain emissions reductions consistent with the depth of abatement at the point of reaching global net-zero in 1.5˚C pathways (i.e., achieving the long-term SBT) and
    2. Neutralising the impact of any residual emissions by permanently removing an equivalent volume of CO_2.
- **Why**: Although most companies will reduce emissions by at least 90% through their long-term science-based targets, some residual emissions may remain. These emissions must be neutralised to reach net-zero emissions and a state of no impact on the climate from GHG emissions.

2.2 Changes to near-term SBT criteria

In response to the urgency and scale of the climate emergency, the SBTi is ratcheting up its expectations for businesses by ensuring all targets align with a 1.5°C future.

From 15 July 2022 onwards, the SBTi will only validate targets aligned with a minimum level of ambition of 1.5°C for scope 1 and 2 and well-below-2°C for scope 3. In addition to this, the SBTi is reducing the timeframe for near-term targets from a maximum of 15 years to a maximum of 10 years. This is summarised in Table 1. Updates to the target setting criteria for near-term targets (Version 5.0) in line with the new SBTi Net-Zero Standard will be launched at the end of 2021.

To validate net-zero commitments through the SBTi, your company's near-term SBTs must meet these revised criteria. If your company has a legacy SBT that does not fulfil the ambition criteria for scope 1 and 2 or scope 3, it must be updated (see here for more information on this process). The SBTi is waiving the 10-year timeframe requirement for companies that already have validated near-term SBTs. You can find out more about the SBTi's work to develop 1.5°C pathways in "Part 3: Mitigation pathways in the Net-Zero Standard."

Table 1 Summary of changes to near-term SBT criteria

Criterion	Planned changes
Timeframe	Under the current criteria, near-term SBTs may have a target year 5-15 years from the date of submission. In the new criteria, this will be changed to 5-10 years from the date of submission.
Scope 1 & 2 ambition	The minimum scope 1 and 2 ambition of near-term SBTs will be increased from well-below 2°C to 1.5°C
Scope 3 ambition	The minimum scope 3 ambition of near-term SBTs will be increased from 2°C to well-below 2°C. Supplier engagement targets will remain eligible.

Part 3: Mitigation pathways in the Net-Zero Standard

3.1 How mitigation pathways are used to inform SBTs

Mitigation pathways play a key role in setting SBTs. For near-term SBTs, mitigation pathways inform the **rate of emissions reductions or emissions intensity reductions** that are needed. For long-term SBTs, they inform the **overall emissions reduction or convergence intensity** that must be reached to be aligned with net-zero at the global or sector level.

Because of this, near-term SBTs are target year-dependent, while long-term science-based targets are company target year-independent. This means that your reduction target will differ depending on the target year selected for your near-term SBTs, but the reduction target will not differ for the chosen target year for your long-term SBTs. This is illustrated in Figure 5 below. Because of this, companies will set their net-zero commitment and long-term SBT target date depending on when these overall emission reductions can be achieved.

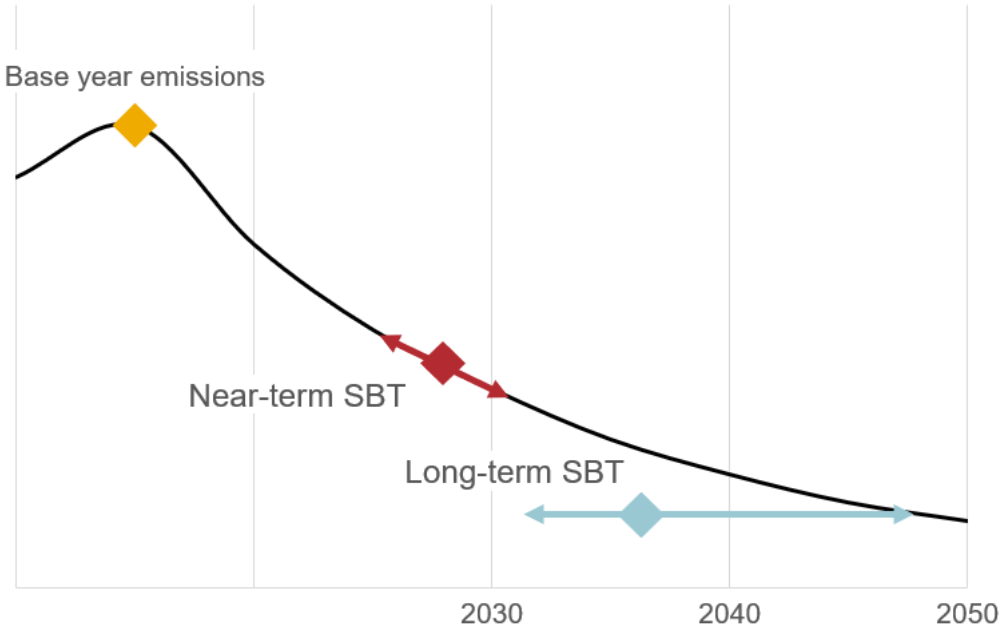


Figure 5 Schematic showing target year-dependency of near-term SBTs and target year-independency of long-term SBTs. Companies can select a target year of 2050 or earlier for long-term SBTs, which depends on how quickly it can reduce its emissions.

3.1.1 Overview of pathways and which companies should use them

The SBTi offers a mixed sector pathway, which is sector-agnostic, and sector-specific pathways for SBT-setting. For most companies, the recommendation is to set absolute targets using the mixed sector pathway.

Using the mixed sector pathway, many companies set near-term SBTs that reduce emissions at a linear annual rate of 4.2% (e.g., 42% over ten years); however, some sector-specific pathways vary significantly from the mixed sector pathway in the near-term.

In the long-term, emissions in the mixed sector pathway are reduced at least 90% and most sectors reduce CO_2 emissions 90% or more from 2020 levels. Consequently, for many companies, long-term SBTs will be equivalent to at least a 90% absolute reduction across scopes regardless of whether the mixed sector pathway or sector-specific pathways are used.

Sector-specific pathways are available or in development for the built environment sector, heavy industry sectors including cement and steel, transport, energy supply and sectors with significant forestry, land-use and agriculture (FLAG) emissions (Figure 6).

Companies in sectors where emissions are reduced significantly faster than the global average, like power generation, are required to use the appropriate sector-specific pathway to set SBTs. Additionally, companies in the FLAG sectors will be required to set SBTs using FLAG sector-specific pathways after FLAG guidance and GHG Protocol Land Sector and Removals guidance are finalized. Companies in all other sectors may use either the mixed pathway or sector-specific pathways to cover relevant emissions.

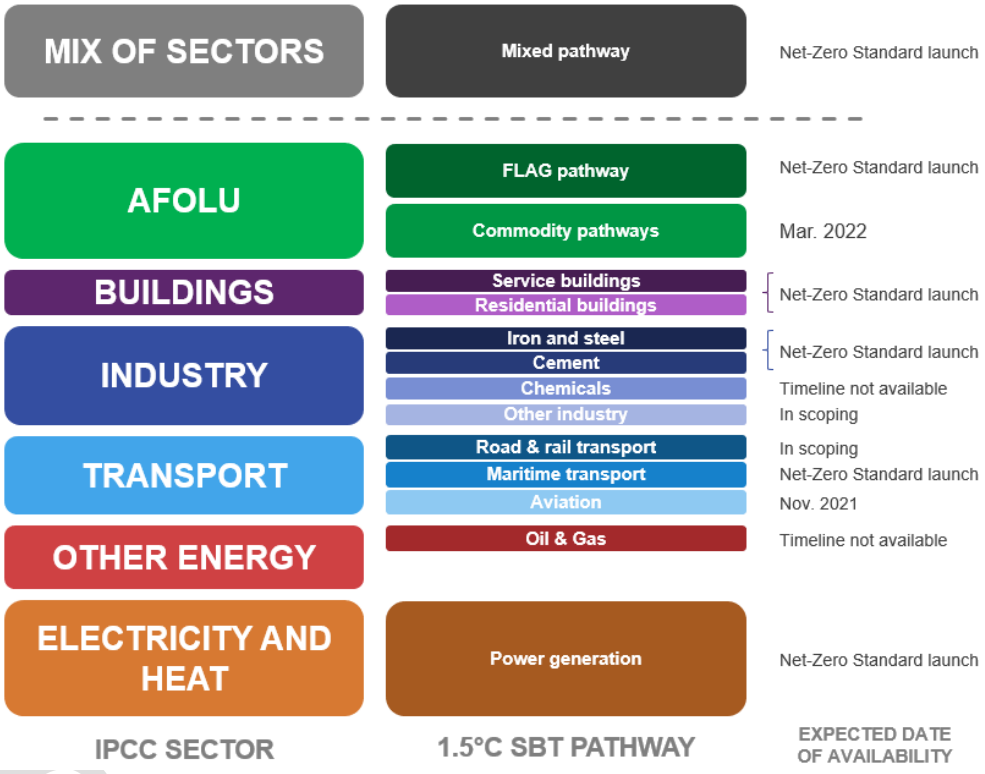


Figure 6 Summary of SBT pathways planned or in development

For near-term SBTs, sector-specific pathways may only be used to calculate intensity targets. For long-term SBTs, sector-specific pathways may be used to calculate either intensity targets or absolute targets, as an alternative to using the mixed sector pathway. Companies in heavy-emitting sectors often use sector-specific pathways to calculate both near-term and long-term intensity targets. Other companies with scope 3 emissions allocated to the activities of a heavy-emitting sector use a mix of approaches to calculate targets. When setting long-term targets, these companies must ensure that upstream scope 3 emissions are covered by an absolute target or a sector-specific intensity target that reflects both supply-side and demand-side mitigation where relevant.

Box 1. How does the SBTi determine 1.5°C-aligned pathways?

The SBTi reviews estimates of the remaining emissions budget, top-down mitigation scenarios, and sectoral studies to determine 1.5ºC-aligned pathways at the global and sectoral level. According to the IPCC, the remaining budget to limit global warming to 1.5ºC with a 50% probability is about 500 GT CO_2 (IPCC 2021). In top-down scenarios, CO_2 emissions are halved by around 2030 and reach net-zero by 2050. Non-CO_2 greenhouse gases such as nitrous oxide (N_2O) and methane (CH_4) are also deeply reduced (IPCC 2018). By comparison to top-down scenarios, most sectoral studies incorporate a wider range of mitigation options in greater detail but are more limited in temporal scope and range of emissions sources. In the climate action arena, where mitigation scenarios are increasingly used as a tool to steer voluntary climate action, it is important for sector pathways not to exceed the global emissions budget in aggregate when used for target-setting.

Our assessment has concluded that the IEA (2021), 'Net-Zero Roadmap,' and Roe et al. (2019), 'Contribution of the land sector to a 1.5ºC world,' are the most credible, consistent, and comprehensive sources from which to derive carbon budget allocation across sectors. Both studies have undergone rigorous peer review, incorporate detailed sectoral considerations, and utilize recent historical data. In aggregate, they cover about 90% of global emissions and do not exceed the global emissions budget. These studies are also consistent with delivering a wide range of social and environmental benefits.

Some pathways used by the SBTi are drawn directly from the IEA Net-Zero Emissions (NZE) scenario. Pathways for forestry, agriculture, and land-use (FLAG) emissions are derived from a combination of Roe et al. (2019) and updated commodity-specific pathways based on Smith et al. (2016), 'Science based GHG Emissions targets for agriculture and forestry commodities.' Subject to review, pathways that demonstrate similar or deeper emissions reductions than NZE or Roe et al. (2019) may also be used by the SBTi. The SBTi encourages the development of high-resolution sectoral pathways that build on available studies with gap-filling, downscaling, and proposing adjustments where needed.

How was the mixed sector pathway developed?

The mixed pathway is a one-size-fits-all pathway for non-FLAG SBTs (Figure 7a). It covers all non-FLAG GHG emissions covered under the Kyoto Protocol except landfill waste and fluorinated gases. Consequently, it reflects the main GHG emissions (CO_2, CH_4, and N_2O) from energy, buildings, industry, and transport. (Companies with emissions from landfill waste or fluorinated gases may still use the mixed sector pathway or a sector-specific pathway to calculate targets that fulfil SBTi Criteria.)

First, an energy and industrial processes gross CO_2 emissions corridor was developed based on a comparison of the remaining emissions budget, top-down mitigation scenarios, and sectoral studies (Figure 7b). Our comparison has included:

- The interquartile range of 1.5ºC low/no overshoot scenarios from IPCC (2018), 'Special Report on Global Warming of 1.5ºC' (SR15)
- P1 and P3, which were selected by the authors of SR15 as illustrative archetype scenarios used in the report
- One Earth Climate Model (OECM), which is a model by the Institute for Sustainable Futures at University of Technology Sydney (UTS) with scenarios that reach net-zero by 2050 without overshooting 1.5ºC and with minimal reliance on CDR (Teske et al. 2020)
- NZE, which is the main scenario from the IEA (2021), 'Net-Zero Roadmap'

- The "Beyond 2°C Scenario" (B2DS), which is a scenario from the IEA (2017), 'Energy Technology Perspectives 2017,' that has been used by the SBTi to define well-below 2°C SBTs since 2019.

In 2030, the energy and industrial processes gross CO_2 emissions corridor is similar to the interquartile range of 1.5ºC low/no overshoot scenarios with an upper range similar to IEA B2DS, NZE, and P3; and a lower range similar to P1. In 2050, the emissions corridor is similar to NZE, OECM, and P1, but considerably lower than the interquartile range of 1.5ºC low/no overshoot scenarios due to conservative estimates of CO_2 removal (CDR) availability. Studies have shown that many top-down scenarios use CDR at rates that are considered infeasible, which suggests that larger gross emissions reductions are needed to reach net-zero by 2050 than suggested by those scenarios (Vaughan and Gough 2016; Warszawski et al. 2021). Additionally, the IPCC states that "pathways that feature low energy demand," like P1, "show the most pronounced synergies and the lowest number of trade-offs with respect to sustainable development and SDGs (very high confidence)" (Roy et al. 2018).

Next, to complete the mixed emissions pathway, energy related N_2O emissions from the mean of 1.5ºC low/no overshoot scenarios and CH_4 emissions from NZE were added.

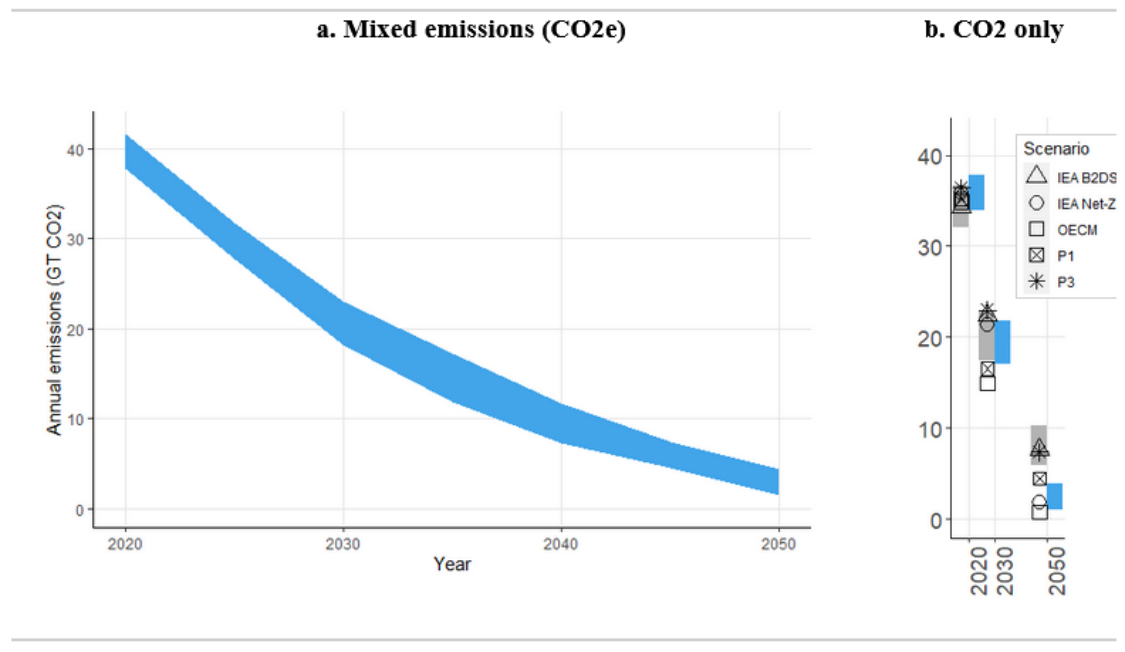


Figure 7 SBTi emissions corridors (light blue) for a. mixed emissions and b. CO_2 only with comparison to the interquartile range of 1.5ºC low/no overshoot scenarios from IPCC SR15 (grey bars) and individual scenarios (black icons). GHG emissions from FLAG; landfill waste; and fluorinated gases are excluded from both corridors. Companies in the FLAG sectors will be required to use separate FLAG sector-specific pathways after FLAG guidance and GHG Protocol Land Sector and Removals guidance are finalized.

3.2 Preliminary pathway data for near-term and long-term SBTs

Table 2 shows preliminary data for the mixed sector pathway and sector-specific pathways covered by the SBTi. Some sectors reduce emissions more than the mixed sector pathway in 2050, while other sectors reduce emissions less. Some sectors where emissions are reduced more in the sector-specific pathways (e.g., cement) can still use the mixed sector pathway for two main reasons: (1) the difference is small (<10% of base year emissions) and (2) companies

are required to neutralise unabated emissions regardless, which aims to counteract the impact of residual emissions and incentivize continued abatement once net-zero is reached.

Pathways included in the pre-launch consultation draft of this document are preliminary and some are planned to undergo changes. Companies should review the final guidance for changes before submitting targets to the SBTi.

Table 2 Summary of 1.5 ˚C-aligned pathways. For near-term SBTs, only the mixed sector pathway and the FLAG sector pathway may be used to calculate absolute contraction targets; and intensity targets are calculated using the Sectoral Decarbonisation Approach (SDA), which may result in targets above or below the sector average. For long-term SBTs (green), any eligible pathway may be used to calculate absolute targets based on the 2020-2050 % reduction; and intensity targets are calculated based on the sector intensity value in 2050. Due to COVID-19 impacts, 2019 historic emissions data is used in place of 2020. Pathway data in this table are direct emissions only.

Pathway name	Pathway type	Units	Value			Percentage reduction	
			2020	2030	2050	2020-2030	2020-2050
Mixed sector pathway	Absolute	GT CO_2e	40	23	4	42%	90%
Cement	Absolute	Mt CO_2	2500	1900	130	23%	95%
	Intensity	tCO_2/t cement	0.58	0.45	0.033	24%	94%
FLAG sector	Absolute	GT CO_2e	12	8	2	35%	80%
Iron and Steel	Absolute	Mt CO_2	2500	1800	220	29%	91%
	Intensity	tCO_2/t steel	1.3	0.92	0.11	32%	92%
Maritime transport	Absolute	Mt CO_2	1000	700	0	30%	100%
	Intensity	gCO2/tnm	16	8.4	0	48%	100%
Power generation	Absolute	Mt CO_2	14000	3200	24	77%	99%
	Intensity	tCO_2/MWh	0.513	0.10	0.00051	81%	99%
Residential buildings	Absolute	Mt CO_2	3000	1800	120	32%	95%
	Intensity	tCO_2/household	0.97	0.57	0.035	41%	96%
Service buildings	Absolute	Mt CO_2	980	430	14	56%	99%
	Intensity	tCO_2/m^2	0.020	0.0073	0.00018	63%	99%
Aviation	Preliminary data not yet available						
Commodity pathways							
Maritime transport							
Other industry							

Part 4: Setting near-term and long-term science-based targets

Companies can take a variety of approaches to developing near-term and long-term SBTs, however, we recommend following these five steps which are described in more detail in this section.

1. Select a base year
2. Calculate your company's emissions
3. Set SBT boundaries
4. Choose a target year
5. Calculate targets

4.1 Select a base year

Companies need to establish a base year to track emissions performance consistently and meaningfully over the target period. Three considerations are important for selecting a base year.

- Scope 1, 2, and 3 emissions data is verifiable and recent
- The base year should be representative of a company's typical GHG profile[5]
- The base year should be chosen such that the target has sufficient forward-looking ambition
- The base year must be no earlier than 2015

Companies that have already set near-term SBTs must use the same base year for their long-term SBT. For more information on setting the base year, please see the corporate manual (v1.1; p.11).

[5] For companies that have been significantly impacted by COVID-19, the SBTi recommends selecting a base year such as 2019 instead of 2020 or 2021 when setting targets. Alternatively, companies are welcome to use a multi-year average base year approach, as described in Chapter 5 of the Greenhouse Gas Protocol Corporate Standard. As some companies have been less impacted by COVID-19 than others, the SBTi will still allow 2020 base years for target setting purposes and will allow companies to make their own determination about the appropriateness of a 2020 base year.

4.2 Calculate your company's emissions

4.2.1 Develop a full GHG emissions inventory

Companies are required to have a thorough emissions inventory that covers at least 95% of company-wide scope 1 and 2 GHG emissions and a complete scope 3 screening. The following points are important for alignment with the GHG Protocol and SBTi Criteria.

Ensure the target boundary is aligned with the GHG Inventory boundary: A company must select a single GHG Protocol defined method (operational control, financial control, or equity share) to determine its organisational boundary. The same method should be used to calculate its GHG emissions inventory and to define its SBT target boundaries. Both the emissions inventory and target boundary should cover all seven GHGs or classes of GHGs covered by the UNFCCC/Kyoto Protocol.

For more information on organisational boundary-setting, please see the SBTi Corporate Manual (v1.1; p.12) and The GHG Protocol Corporate Standard (WRI & WBCSD 2004).

Determine how to treat subsidiaries: Parent companies should set SBTs for subsidiaries in accordance with the selected organisational boundary approach. When required by the organisational boundary approach, parent companies must include emissions from subsidiary operations in their GHG inventory.

The SBTi does allow subsidiaries to submit targets. However, regardless of whether the subsidiary has approved SBTs, parent companies must include subsidiaries in their target boundary as required by the selected organizational boundary approach.

For more information on subsidiaries, please see the SBTi Corporate Manual (v1.1; p.13) and page 19 of the GHG Protocol Corporate Standard (p. 19)

Exclude the use of offsets: Offsets (including neutralisation and compensation) do not count as reductions toward meeting your science-based targets. Companies should only account for reductions resulting from direct action within their operations or value chains.

Exclude avoided emissions: A company's product avoids emissions if it has lower life cycle GHG emissions relative to some other company's product that provides an equivalent function. Avoided emissions occur outside of the product's life cycle and therefore do not count as a reduction of a company's scope 1, 2 and 3 inventory.

For more information on avoided emission, please see the SBTi Corporate Manual (v1.1; p.13) and the World Resources Institute paper on avoided emissions

Determine how to treat indirect use-phase emissions: Indirect use-phase emissions are generated by products that only consume energy indirectly during use over their expected lifetime. Examples of such emissions include the washing and drying of apparel and the cooking and refrigeration of food products.

Indirect use-phase emissions are not within the "minimum boundary" for category 11 (use of sold products) and are listed as "optional."

If companies have significant indirect use-phase emissions and have levers to address them, they are encouraged to estimate these emissions and set an optional target on these emissions. Despite this, optional scope 3 emissions will not be counted towards the two thirds boundary in near-term SBTs and 95% boundary in long-term SBTs.

Include all mandatory scope 3 emissions: Companies must develop a complete scope 3 inventory, which is critical for identifying emissions hotspots, reduction opportunities, and areas of risk up and down the value chain. The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (WRI & WBCSD, 2011), together with the Scope 3 Calculation Guidance, provide detailed guidance on how to complete a scope 3 inventory. The Scope 3 Standard defines 15 distinct categories of upstream and downstream emissions sources and requires companies to include all relevant categories in an inventory, based on such criteria as the magnitude of emissions or the level of influence exerted over the categories. See Chapter 7 of the Scope 3 Standard for further details.

A useful approach to calculating scope 3 emissions is to first calculate a high-level screening inventory. This inventory can be used to directly set a target or to identify high-impact categories for which more accurate data are needed. Over time, companies should strive to develop complete inventories and improve data quality for high-impact categories (e.g., collect primary data) to better track progress against targets.

For more information on calculating a scope 3 emissions inventory, please see the corporate manual (v1.1.; p. 22) and the GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting standard.

4.2.2 Calculate emissions that are reported separately from the GHG inventory

To meet SBTi criteria, companies that use bioenergy must also report direct CO_2 emissions from biomass combustion, as well as removals associated with biomass feedstock. These emissions are reported separately from the company's GHG inventory, in line with Greenhouse Gas Protocol guidance.

Companies that sell or distribute fossil fuels are also required to report the use-phase emissions associated with those fossil fuels. For companies that sell fossil fuels, these emissions are required to be reported in scope 3 category 11 (use of sold products) and covered by a target. For companies that transport or distribute, but do not sell, fossil fuels, these emissions must be covered by a target but are typically not included in a company's GHG inventory.

Companies are also encouraged to calculate GHG emissions from land-use change in their target boundary, although these are not currently required to be included in emissions inventories by the Greenhouse Gas Protocol.[6]

4.3 Set SBT boundaries

4.3.1 Near-term SBT boundary (scopes 1, 2, and 3)

Near-term SBTs must cover at least 95% of company-wide scope 1 and 2 emissions. For companies with scope 3 emissions that are at least 40% of total emissions (scope 1, 2, and 3 emissions), at least 67% of scope 3 emissions must also be covered. Companies in certain heavy-emitting sectors are required to include specific emissions sources or scope 3 categories in their SBT boundary, please see the SBTi Corporate Manual (v1.1; p.17)

4.3.2 Long-term SBT boundary (scopes 1, 2, and 3)

Long-term SBTs must cover at least 95% of company-wide scope 1 and 2 emissions and 95% of scope 3 emissions. See Box 2 for more information.

[6] Note on forthcoming land sector GHG Protocol guidance. See Appendix 3: Further guidance for companies with significant FLAG emissions for more information.

Box 2. The "expansive boundary" approach for scope 3

During the first public consultation on the Net-Zero Standard Criteria, the SBTi explored stakeholder preferences for target boundaries for both emission reductions (abatement) and neutralisation as part of a company's net-zero commitment. This included three questions:

1. Do you agree that the neutralisation boundary of net-zero targets should cover 100% of scope 1, 2, and 3 emissions?
2. Do you think that it is important for the neutralisation boundary of net-zero targets to be identical to the emissions abatement boundary of net-zero targets?
3. Companies will need to include scope 3 emissions in the emissions abatement boundary of net-zero targets. Three approaches to determining minimum scope 3 boundary coverage are being considered (NZ-C18). Do you have a preference for Version A, B or C?
    a. Cover at least 95% of total scope 3 emissions.
    b. Cover at least 67% of total scope 3 emissions, with additional sector-specific requirements
    c. Cover at least 95% of total emissions in scopes 1, 2, and 3

Through the public consultation survey, we found that most respondents felt that the neutralisation boundary of net-zero targets should cover 100% of scope 1, 2, and 3 emissions (59% agree, 12% not sure, and 29% disagree) and that most stakeholders felt it was important for the abatement and neutralisation components of net-zero commitments to be identical (41% agree, 23% unsure, and 36% disagree).

On abatement of scope 3, we found that overall, 55% of respondents prefer Version B (67% with sector requirements), 21% prefer Version A (95% Scope 3), and 17% prefer Version C (95% Scope 1+2+3), and 7% had no preference.

To simplify the net-zero framework, the requirement for a specific quantitative neutralisation target was removed and replaced with a requirement to neutralise any residual emissions that remain unabated when the long-term SBT is achieved to reach net-zero. As it is imperative that the residual emissions are based on the full company footprint, this implies that a full scope 3 target boundary needs to be covered for a true net-zero target to be set. Therefore, a requirement for at least 95% of scope 3 to be covered in the target boundaries was included, consistent with the treatment of scopes 1 and 2. The Expert Advisory Group agreed that this was the most robust option.

Increasing the scope 3 boundary requirements from 67% for near-term SBTs to 95% for long-term SBTs will present various challenges to companies, but also major opportunities to encourage radical collaboration across the value chain to support suppliers and customers to decarbonise. Through the expansive boundary scope 3 approach from the near to long-term, companies have time to work through the complexity of scope 3 and long-term scope 3 reductions, focussing now on fast reductions at scale across all scopes to tackle their most material emission sources. The SBTi recognises the challenges around scope 3 and is therefore developing plans to provide further support to companies through a specific scope 3 project, as well as through a Supplier Engagement Toolkit which will also be released in late 2021.

4.3.3 Additional required SBT coverage

Companies that use bioenergy must include direct CO_2 emissions from biomass combustion and carbon removals associated with bioenergy combustion in their target boundary, even though these emissions are reported outside a company's GHG inventory. Similarly, companies that sell, transport or distribute fossil fuels must include use-phase emissions in their target boundary, even though they may not usually be reported in a company's GHG inventory (see section 4.2.2).

Companies are also encouraged to include GHG emissions from land-use change in their target boundary, although this is not currently required by the Greenhouse Gas Protocol.[7] A summary of the required coverage of near-term and long-term SBTs is shown in Table 3, and a list of available and planned sector guidance is shown in Figure 7.

Table 3 Minimum boundary coverage for near-term SBTs and long-term SBTs

Minimum % boundary coverage by scope		
GHG inventory scope	**Near-term SBTs**	**Long-term SBTs**
Scopes 1+2	95% minimum coverage	
Scope 3	67% minimum coverage (if scope 3 emissions are at least 40% of total scope 1, 2, and 3 emissions)	95% minimum coverage (all companies)
Special boundary coverage requirements by emissions source		
Emissions source	**Near-term SBTs**	**Long-term SBTs**
Use-phase emissions from sold or distributed fossil fuels	Must be covered by an absolute contraction target	
Direct CO_2 emissions from biomass combustion	Must be included in target boundary	

[7] Note on forthcoming land sector GHG Protocol guidance

and carbon removals from bioenergy feedstock	
Sector-specific target boundary requirements	• Transportation companies must set targets on a “well-to-wheel” basis • Power generation companies must set an SDA target on scope 1 power generation, and all sold electricity (if scope 3 coverage is required) • See Figure 8 for an overview of available sector-specific guidance
GHG from land-use change	Optional to include

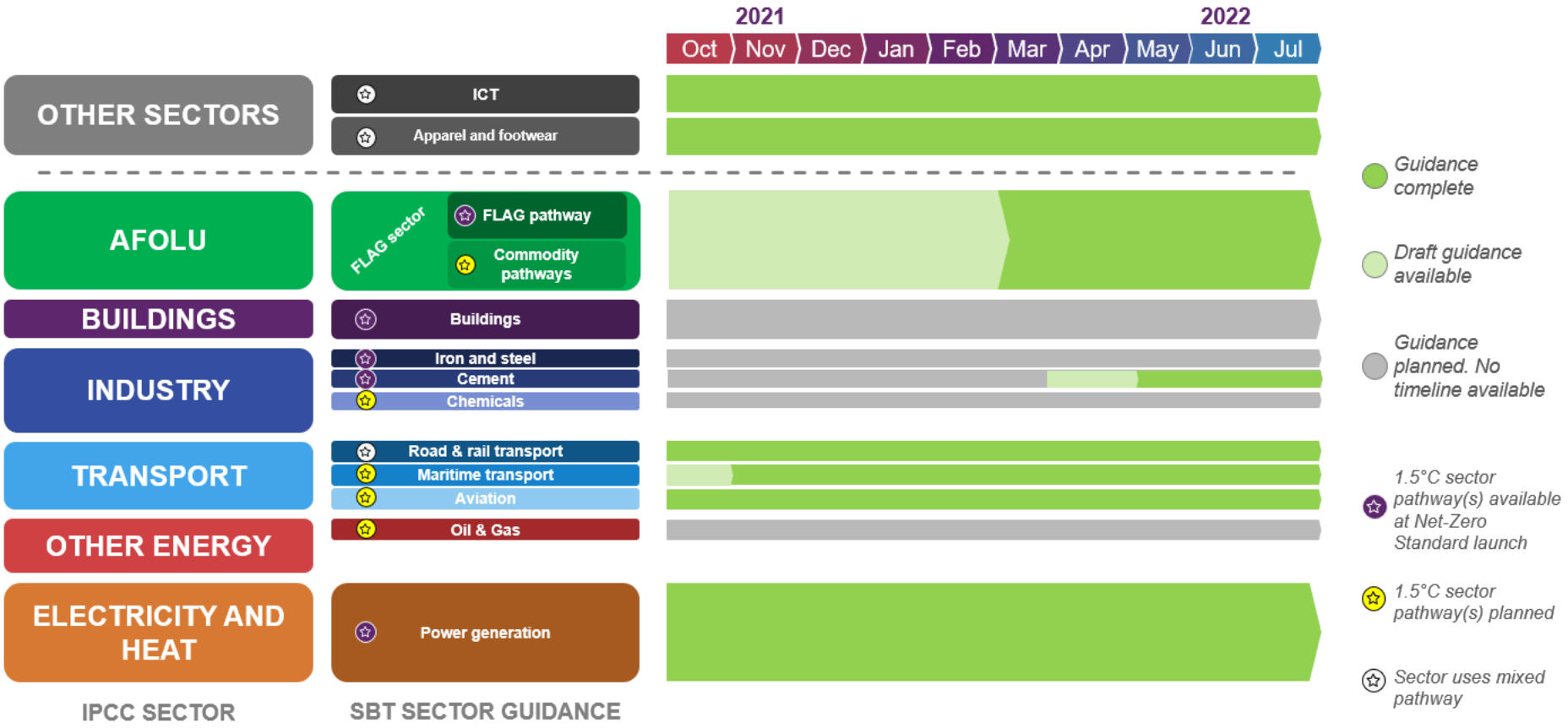


Figure 8 Timeline of planned and completed sector-specific guidance. For sectors where sector-specific guidance is not yet complete, all dates are expected (not binding) due to each project undergoing formal SBTi review before completion. Except for power generation and FLAG, all currently eligible sectors may use the mixed sector pathway to set 1.5 ˚C-aligned near-term and long-term SBTs. Currently eligible sectors where 1.5 ˚C sector-specific pathway(s) are planned but not yet available are strongly recommended to use the mixed sector pathway or FLAG pathway to set SBTs. For the road & rail transport sector, well-below 2 ˚C-aligned sector specific pathways are available but 1.5 ˚C-aligned SBTs must use the mixed sector pathway. The Oil & Gas sector is not currently eligible to set SBTs.

4.3.4 Meeting SBTi boundary criteria with several targets

Companies often set several targets that collectively meet the boundary requirements described above. This is a valid approach to meeting the SBTi Criteria and Net-Zero Standard. Companies may consider setting targets that cover different activities (scope 1, 2, and/or 3) or that cover different scope 3 categories.

4.4 Choose a target year

Near-term SBTs must have a target year 5-10 years from the date of submission to the SBTi, while long-term SBTs must have a target year of before 2050.

Because the ambition of long-term SBTs is target year-independent, companies should begin by choosing any long-term SBT target year before 2050. Based on the results of their target modelling, the company may adjust their chosen target year to be sooner or later depending on its strategy to achieve its long-term target.

SBT methods are used to calculate near-term and long-term SBTs based on a mitigation pathway and company inputs. Companies may choose from the following SBT methods to calculate their targets:

4.5 Calculate targets

Eligible for near-term SBTs and long-term SBTs

- **Absolute contraction:** Using this method, companies reduce absolute emissions by an amount consistent with a mitigation pathway. For near-term SBTs, the minimum reduction is calculated as a linear reduction rate, whereas for long-term SBTs the minimum reduction is calculated as an overall amount.
- **Physical intensity convergence:** Using this method, all companies in a sector converge to the physical emissions intensity of an activity or process. For near-term SBTs, the SDA formula is used, which adjusts a company's target based on their starting point and projected growth. For long-term SBTs, the target is just calculated based on activity's physical intensity in a convergence year.
- **Renewable electricity (scope 2 only):** Using this method, companies set targets for a certain percentage of electricity procurement to be renewable, in accordance with RE100 recommendation, by the target year.

Please refer to section “3.1.1 Overview of pathways and which companies should use them” for more information.

Eligible for near-term SBTs only

- **Engagement targets (scope 3 near-term SBTs only):** Using this method, companies set a target for suppliers or customers representing a certain percentage of emissions to set their own SBTs.
- **Physical intensity contraction:** Using this method, companies define their own emissions intensity metric and set a reduction target that is at least as ambitious as a minimum threshold. The minimum threshold – currently a 2% linear annual reduction with no increase in absolute emissions – will be updated based on pathways that limit warming to well-below 2˚C.
- **Economic intensity:** Using this method, companies reduce the economic emissions intensity (e.g., tCO_2 per unit of revenue) of emissions in a chosen boundary by an amount that is at least as ambitious as a minimum threshold. The minimum threshold – currently a 7% year-on-year reduction – will be reviewed and, if needed, updated based on pathways that limit warming to well-below 2˚C.

Using the methods listed above, companies must set near-term SBTs with a minimum ambition of 1.5°C for scopes 1 and 2 and a minimum ambition of well-below 2°C for scope 3. Long-term SBTs must have a minimum ambition of 1.5°C across scopes.

Table 4 Ambition ranges for target classification of near-term science-based targets.

Long-term temperature goal	Annual linear reduction rate over target period
2˚C Approx. 50% chance of limiting warming in 2100 to below 2˚C.	1.23% ≤ X < 2.5%
Well-below 2˚C Approx. 66% chance of limiting peak warming between present and 2100 to below 2˚C.	2.5% ≤ X < 4.2%
1.5˚C Approx. 50% chance of limiting peak warming between present and 2100 below 1.5˚C.	X ≥ 4.2%

A summary of minimum target boundary, target timeframe, and method eligibility and minimum ambition is shown in Figure 8 below.

Figure 8. Summary of target boundary, target timeframe, and method eligibility and minimum ambition requirements for near-term and long-term SBTs

		Near-term science-based target			Long-term science-based target		
Scopes 1 + 2	Target boundary	95% coverage			95% coverage		
	Aligned to	1.5°C ambition			1.5°C ambition		
	Target year	5-10 years from date of submission			2050 or sooner		
	Eligible methods to calculate target	**Absolute contraction** • 4.2% linear annual reduction (l.a.r.)	**Physical intensity convergence** • Depends on sector and company input	**Renewable electricity (Scope 2)** • 80% by 2025 • 100% by 2030	**Absolute contraction**[1] • 90% reduction overall (mixed pathway)	**Physical intensity convergence** • Depends on sector	**Renewable electricity (S2)** • 100%
Scope 3	Target boundary	If >40% of total emissions, 67% coverage required			95% coverage		
	Aligned to	At least well-below 2°C ambition[2]			1.5°C ambition		
	Target year	5-10 years from date of submission			2050 or sooner		
	Eligible methods to calculate target	**Absolute contraction** • 2.5% l.a.r.	**Physical intensity convergence** • Depends on sector and company input	**Physical intensity contraction** • 5.1% l.a.r.[3]	**Economic intensity (GEVA)** • 7% year-on-year (compound) reduction[3]	**Supplier or customer engagement** • E.g. 80% of suppliers by emissions by 2025	**Absolute contraction**[1] • 90% reduction overall (mixed pathway)	**Physical intensity convergence** • Depends on sector

1. When setting long-term SBTs, companies may use sector-specific absolute pathways to set absolute targets, as an alternative to the mixed pathway
2. Although minimum scope 3 ambition for near-term SBTs is well-below 2°C (as shown by this figure), companies are encouraged to set scope 3 targets aligned with 1.5°C ambition
3. For near-term SBTs, the minimum ambition of the scope 3 methods physical intensity contraction and economic intensity (GEVA) are being reviewed and updated to align with well-below 2C

N.B. Methods and minimum ambition values are subject to change

4.5.1 Calculating near-term SBTs

Near-term SBTs covering scopes 1 and 2 can be calculated using absolute contraction or the physical intensity convergence target setting method. Renewable electricity targets are also accepted as a substitute for targets that cover scope 2. Intensity convergence targets may use any sector-specific pathways that are available at the time of submission (Figure 6) and may be subject to sector-specific criteria. For in-depth guidance on calculating near-term SBTs, please see the SBTi Corporate Manual.

4.5.2 Calculating long-term SBTs

Calculating long-term SBTs is relatively simple because target ambition does not depend on the chosen target year and targets are less dependent on company input data. Companies must use the Net-Zero Tool Excel workbook to set long-term SBTs, which has not been released as part of this public consultation, however a summary of 1.5°C-aligned pathways can be found in Table 2. Instructions to use the Net-Zero Tool will be included in the final version of the manual.

4.5.2.5 Target wording

Once you have calculated your company's long-term SBT, you should consider how the target can be expressed clearly and succinctly. Companies that have used the mixed pathway to set an absolute contraction target can simply express the target as:

Company X commits to reduce scope 1+2+3 emissions 90% by 2035 from a 2018 base year.

Companies that have also set a long-term SBT on FLAG emissions can include a second target:

Company X also commits to reduce emissions from agriculture, forestry, and land-use 80% by 2035 from a 2018 base year

Companies that have used the pro tool to calculate several targets may need to include more detail in their target wording. First, companies should express their intensity target(s). For example:

Company Y commits to reduce the scope 1+2 emissions per ton of steel 91% by 2040 from a 2018 base year.

Next, companies should express their absolute target(s). Although the SBTi will need to review each activity-specific target to validate long-term SBTs, companies may have flexibility combining several absolute targets that cover the same emissions scope(s) or scope 3 category(s). For example, a company that has calculated two absolute targets for scope 3 category 3 upstream transport from trucks and aviation may combine them into a single target:

Company Y also commits to reduce scope 3 emissions from upstream transport by 88%.

Companies that set an intensity target covering a subset of scope 1+2 emissions and an absolute target covering the remaining emissions may express the targets as follows:

Company Z commits to reduce scope 1+2 emissions per ton of aluminium 80% by 2040 from a 2018 base year. Company Z commits to reduce all other scope 1+2 emissions 90% by 2040 from a 2018 base year.

Box 3. A note on FLAG emissions

The forest, land and agriculture (FLAG) sectors, also known in the scientific community as the agriculture, forest, and other land use (AFOLU) sector, are responsible for nearly a quarter of global GHG emissions and up to 20% of the needed mitigation through 2050 (Griscom et al 2017) when land sector removals are included. Many companies with land-intensive operations have committed or set targets through SBTi, and many are also reporting their emissions publicly.

Despite this, few companies account for FLAG emissions or removals in their targets or disclosures. A key barrier is the lack of available standards, methods and the difficulty of data gathering for these activities. Land sector emissions ("biogenic carbon") accounting and target setting are being standardised through two key projects led by SBTi partner organisations, and as a result many companies will be addressing these emissions for the first time.

Led by WWF, the SBTi Forest, Land and Agriculture (SBTi FLAG) project is currently developing guidance for companies in land-intensive sectors such as food, agriculture, and forestry to set science-based targets that fully incorporate deforestation and other land-related emissions. This guidance will include two approaches: 1. a FLAG sector-wide pathway and 2. 10 commodity-specific pathways for beef, poultry, pork, dairy, corn, wheat, rice, soy, palm oil, and wood fibre. This project is due to complete by March 2022. All FLAG pathways include CO_2 and non-CO_2 gases, and include emissions related to agriculture and forestry 'to farm gate', excluding later processing emissions, which are covered under other SBTi pathways.

Alongside this, The Greenhouse Gas Protocol is undertaking a process to develop new guidance on accounting for carbon emissions and removals. This project is due for completion at the end of 2022. The GHG Protocol guidance will provide information to companies on how to account for and report the following activities in their greenhouse gas inventories:

- Land use/management and land use change
- Carbon removals and storage
- Bioenergy and other biogenic products
- Related topics

If your company has already calculated emissions from FLAG activities, you should include these within the target boundary of both your near and long-term science-based targets.

Before the GHG Protocol guidance for land sector emissions is published, we recommend you follow the guidance of the documents stated in Table 5.

Table 5 Additional guidance documents for calculation FLAG emissions

Publisher	Document
GHG Protocol	• Corporate Standard • GHG Protocol Scope 3 Standard • Product Standard • Agriculture Guidance • LULUCF project guidelines • Brazil forestry tool
IPCC	• Guidelines for National GHG Inventories. • 2006 Guidelines, Good Practice Guidance for LULUCF • 2019 Refinement
ISO	• ISO 14064 1:2018
Quantis	• Accounting for Natural Climate Solutions Guidance
Gold Standard	• Value Change Initiative

For further details on this topic, please see Appendix 3: Further guidance for companies with significant FLAG emissions.

Box 4. Can insetting count towards my scope 3 reduction?

There are multiple definitions for the term “insetting” (also referred to as supply chain interventions) and no standardization of the term, which makes it difficult to give a clear determination of what can and can’t be included within scope 3 reductions. Insetting is used to describe interventions that are wholly contained within a scope 3 value chain boundary of a company or interventions partially within their scope 3 supply chain boundary (spanning their supply chain and other companies’ supply chains). Accounting approaches for insetting also vary with the use of both project accounting and corporate accounting.

As this issue has not been settled to date in the GHG Protocol process, the SBTi recommends a conservative approach at this time. Companies should only include emission reductions or removals (removals only in the case of FLAG targets) from “insetting” projects that use a corporate accounting approach and are wholly contained within their supply chains or the portion of a “partially-included” project that is within their supply chain and linked directly to sourcing.

Further work is ongoing to standardise the definition of insetting/supply chain interventions and clear accounting methodologies. For these reasons, the SBTi will assess insetting on a case-by-case basis during the validation process and may not approve their use.

Part 5: Net-Zero Criteria & Recommendations

This part of the manual lays out the criteria that companies must meet for their net-zero targets to be validated by the SBTi, as well as additional recommendations that the SBTi encourages companies to follow. These criteria and recommendations will be integrated into the main SBTi Criteria document when the Net-Zero Standard is launched[8].

The criteria and recommendations are organised into four sections:

1. Near-term science-based targets section lays out requirements for near-term science-based targets that ***supersede*** the requirements within the SBTi's science-based target criteria[9]. Companies must continue to follow the SBTi Criteria for near-term targets ***in addition*** to these criteria.
2. The second section, Long-term science-based targets, addresses:
    a. Long-term science-based target timeframe requirements (Long-term SBT timeframe)
    b. How much value chain emissions must be reduced to reach net-zero (Long-term SBT ambition)
    c. How companies should define emission reduction boundaries in long-term science-based targets (Long-term SBT boundary)
3. The third section, Beyond value chain mitigation, includes a recommendation that companies take action or invest in mitigation beyond their science-based targets, and a requirement for neutralisation of emissions when the long-term science-based target is achieved.
4. The final section, Communication, Claims, and Validity, specifies official target wording that must be publicly available as well as reporting requirements

This document includes supporting text and examples to help readers understand the practical implications and rationale of draft criteria. The draft criteria are presented in table form with a column used to provide additional context. Criteria highlighted in yellow are linked to feedback survey questions. An example is shown by Table 6.

Table 6 Example table of draft criteria / recommendations and description

Criteria / recommendation This column used for draft criteria or recommendation text	**Description** This column provides additional context for public consultation (not intended for final criteria)
NZ-C/R. Example of criterion where **feedback is not requested** *Draft criteria text*	Description of net-zero criterion (NZ-C) or recommendation (NZ-R) with practical examples and supporting information if needed

[8] The Net-Zero Standard launch is planned to coincide with the SBTi's annual resource update, which will include Version 5.0 of the SBTi Criteria.
[9] These criteria are more ambitious than current SBTi criteria for science-based targets and therefore companies must follow these current criteria to comply with the Net-Zero Standard requirements.

NZ-C. Example of criterion where **feedback is requested** through the public consultation survey *Draft criteria text*	Description of net-zero criterion (NZ-C) or recommendation (NZ-R) with practical examples and supporting information if needed

5.1 Near-term science-based targets

This section contains criteria for near-term science-based targets that are additional to the requirements of the current SBTi Criteria. These criteria will be integrated into the SBTi Criteria in Version 5.0, which will apply to all companies setting near-term SBTs regardless of whether they set a net-zero target.

Please refer to the current SBTi criteria in addition to this document when setting near-term science-based targets. The table below notes where current SBTi Criteria are superseded by the Net-Zero Criteria.

Table 7 Near-term science-based targets draft criteria and description

Criteria / recommendation	Description
NZ-C1. Requirement to have a near-term science-based target *Companies must have valid near-term (5-10 year) science-based targets (SBTs) that meet SBTi Criteria to be eligible for a net-zero target, unless the long-term SBT target year is 10 years or fewer from the date of submission. Companies' near-term SBTs must also comply with the criteria listed below in this document.*	Companies must have valid SBTs that meet SBTi Criteria to be eligible for a net-zero target unless the long-term science-based target year is sooner than the maximum target year of near-term SBTs (i.e., 10 years from the date of submission).
NZ-C2. Near-term science-based target year *If required by NZ-C1, companies shall have an SBT with a target year 5-10 years from the date of submission.*	Currently, SBTs can have a target year 5-15 years from the date of submission but this will be reduced to 10 years for most or all companies. The SBTi is assessing whether to continue allowing near-term SBTs with a 15-year timeframe for sectors where emissions reductions over a 10-year period are limited by long asset lifespans in eligible 1.5˚C scenarios. This criterion supersedes "R4 — Target year" and "C19 – Timeframe" in the current SBTi Criteria.
NZ-C3. Near-term science-based targets: level of ambition (scopes 1 and 2) *Emissions in scopes 1 and 2 must be reduced by an amount consistent with scenarios that keep global temperature increase to 1.5°C*	The scope 1 and 2 ambition of near-term SBTs must be 1.5°C-aligned or more ambitious. For absolute contraction, the minimum annual reduction rate for 1.5°C-aligned SBTs is 4.2%. These rates are applied as a linear annual

	reduction (e.g., 42% reduction over 10 years), not a compound reduction. Physical emissions intensity pathways are also available for electric utilities with power generation using the intensity convergence method (SDA). The SBTi plans to develop additional 1.5°C-aligned near-term SBT pathways as described in Figure 8. This criterion supersedes "C8 - Level of ambition" in the current SBTi Criteria.
NZ-C4. Near-term science-based targets: level of ambition (scope 3) *Where scope 3 coverage is required, emissions must be covered by targets consistent with, or more ambitious than, delivering a well-below 2°C-aligned emissions outcome.*	Near-term science-based targets covering scope 3 must be well-below 2°C aligned or more ambitious. Currently available methods are absolute contraction (2.5% minimum annual linear average reduction), SDA (based on the IEA ETP 2017 B2DS scenario), and supplier engagement targets (C20.1 of SBTi Criteria) with a well-below 2°C minimum ambition. This criterion exceeds the current minimum scope 3 ambition of SBTs by excluding 2°C-aligned targets, and thus supersedes "C20 — Level of ambition for scope 3 emissions reductions targets" in the current SBTi Criteria.

5.2 Long-term science-based targets

Emission reductions are at the heart of achieving net-zero. While GHG emission removals from the atmosphere will support reaching global net-zero, removals cannot safely "replace" emissions reductions.[10] Thus, net-zero targets must include clearly defined emissions reduction goals, as well as a commitment to remove any residual emissions.

5.2.1 Long-term SBT timeframe

The scientific community has stated the need to halve CO_2 emissions by 2030 and reach net-zero global CO_2 emissions by mid-century to limit global warming to 1.5°C. Paired with the need for deep reductions in non-CO_2 emissions, companies should aim to achieve net-zero GHG emissions in 2050 or sooner. This section specifies eligible base years and target years for long-term science-based targets.

Table 8 Long-term science-based targets criteria and description

Criteria / recommendation	Description
NZ-C5. Long-term science-based target year *Net-zero SBTs shall have a target year no later than 2050.*	This criterion requires long-term science-based targets to be set for a target year no later than 2050 (FY2049/2050).
NZ-C6. Base year(s) *The company shall use the same base year for its long-term science-based targets as its near-term SBTs. The base year must be no earlier than 2015.*	This criterion requires that companies use its near-term SBT base year for setting long-term SBTs, which is beneficial for consistency and transparency. Base years are used to calculate the ambition of most types of targets and to track progress against all targets. 2015 has been chosen as the earliest eligible base year to improve SBT comparability and relevance. More than 90% of approved SBTs submitted in 2019 or 2020 used a base-year of 2015 or later. This criterion only applies to long-term science-based targets. Therefore, it does not mean that companies that set new near-term science-based targets in the future that have already set long-term science-based targets must use the same base year.

[10] See Foundations for Science-based Net-Zero Target-setting in the Corporate Sector – especially Section 3.4, Supplementary Discussion 1, and Supplementary Discussion 4 – for an analysis of this topic.

5.2.2 Long-term SBT ambition

This section indicates the minimum amount that companies must reduce emissions to reach a state of net-zero consistent with the ambition of the Paris Agreement. The criteria require emissions in the target boundary (scopes 1, 2, and 3) to be reduced by an amount consistent with the point when net-zero is achieved at the global or sector level in 1.5°C-aligned scenarios.

Specific quantitative benchmarks (e.g., minimum emissions reduction) and eligible science-based methodologies for target-setting are included within the document in Part 3: Mitigation pathways in the Net-Zero Standard.

Table 9 Long-term SBTs: Ambition draft criteria and description

Criteria / recommendation	Description
NZ-C7. Level of ambition *Companies shall set long-term science-based targets to reduce scope 1, 2 and 3 emissions by an amount consistent with net-zero at the global or sector level in scenarios that limit warming to 1.5°C.*	Emissions in scopes 1, 2, and 3 that are covered by the long-term science-based target boundary must have been reduced by an amount consistent with net-zero at the global or sector level in scenarios that limit warming to 1.5°C. Companies may calculate their targets using a global or sector/activity-specific method as described in NZ-C9.
NZ-C8. Absolute and intensity targets *Absolute or intensity targets may be used to cover emissions in any scopes using eligible 1.5°C scenarios or sector pathways. Intensity targets on upstream scope 3 categories must reflect both supply-side and demand-side mitigation, where relevant.*	Companies may set absolute targets in fulfilment of C7 (Deep Decarbonisation) using the mixed sector pathway or a sector-specific absolute emissions pathway for emissions in any scope. Companies may also set intensity targets using a sector-specific intensity pathway to fulfil C7 for emissions in any scope except upstream scope 3 categories in cases where demand-side mitigation is relevant and not reflected by the intensity pathway. Per this requirement, in sectors where reduced material demand is a key mitigation lever (transport, buildings), intensity targets per ton of steel or cement are not eligible for targets that cover scope 3 purchased goods and services. Additionally, for scope 3 categories where reduced aviation or road transport is a key mitigation lever (business travel, employee commuting), intensity targets per passenger kilometre are not eligible.

	Example of absolute target calculated using mixed pathway: Company X commits to reduce absolute scope 1, 2, and 3 emissions 90% by 2040 from a 2018 base-year. *Example of absolute target calculated using the sector-specific pathway:* Company X commits to reduce absolute scope 3 emissions from cement purchases 95% by 2040 from a 2018 base-year. *Example of intensity target:* Company X will reduce the scope 1 and 2 emissions intensity of cement production 95% to 0.03 tCO_2e/ton of cement by 2040 from a 2015 base-year
NZ-C9. Method validity *Targets must be modelled using the latest version of methods and tools approved by the initiative. Targets modelled using previous versions of the tools or methods can only be submitted to the SBTi for an official validation within 6 months of the publication of the revised method or the publication of relevant sector-specific tools.*	Targets are required to be modelled using science-based methods that have been approved by the SBTi. Major updates to tools and methods are generally announced at least several months in advance of publication. Minor updates are occasionally introduced to enhance user experience or resolve bugs. There is a six-month grace period for companies to submit targets using the most recent legacy version of tools and methods once a newer version has been published.
NZ-C10. Combined scope targets *Targets that combine scopes (e.g., 1+2, 1+2+3) are permitted.*	Combined scope targets are eligible if the SBTi can review the ambition and confirm that it meets the ambition criteria in NZ-C7, NZ-C8 and NZ-C9.
NZ-C11. Ambition of targets on fossil fuel sale, transmission, and distribution *Companies that sell, transmit, or distribute natural gas or other fossil fuel products shall set emission reduction scope 3 targets for the*	This criterion requires companies to set targets on emissions linked to the sale or distribution of fossil fuels, regardless of the size of these emissions. This applies to companies operating downstream of production of oil and gas. For

"Use of sold products" category that are at a minimum consistent with the level of decarbonisation required to keep global temperature increase to 1.5°C compared to pre-industrial temperatures.	upstream Oil & Gas companies, where this guidance is relevant it will be superseded by sector-specific criteria and guidance that are under development in the SBTi's oil & gas project. This criterion is specifically focused on the ambition of emission reductions within net-zero targets. The minimum ambition of targets on fossil fuel sale, transmission and distribution for near-term SBTs must be at least 1.5°C, superseding C20.2 of the current SBTi Criteria.

5.2.3 Long-term SBT boundary

One of the most important aspects of corporate targets is the range of emission sources covered within the boundary of the target. This section indicates that the boundary of targets must cover company-wide scope 1, 2, and 3 emissions. Ultimately, this section should ensure that the boundary of targets is both comprehensive and actionable for companies participating in a societal shift to global net-zero.

Table 10 Long-term science-based target boundary draft criteria and description

Criteria / recommendation	Description
NZ-C12. Long-term science-based target boundary (scopes 1 and 2) *The boundary of long-term science-based targets shall cover company-wide scope 1 and scope 2 emissions, as defined by the GHG Protocol Corporate Standard. Exclusions in the GHG Inventory and target boundary must not exceed 5% of total scope 1 and 2 emissions.*	In combination with NZ-C5 (scope 1 and 2 significance thresholds), this criterion requires companies to cover at least 95% of scope 1 and 2 emissions in the long-term science-based target boundary.
NZ-C13. Requirement to have a scope 3 target *All companies shall include emissions from all relevant scope 3 categories in long-term science-based targets.*	This criterion requires all companies to include scope 3 emissions in the boundary of long-term science-based targets to reflect what is required by companies to contribute towards reaching net-zero at the global level. The importance of including value chain emissions is described in *Foundations for Net-zero Target Setting in the Corporate Sector* and this criteria is consistent with the mitigation hierarchy, whereby companies are required to reduce their operational and value chain emissions before engaging in neutralisation activities.

NZ-C14. Long-term science-based target boundary (scope 3) *The boundary of long-term science-based targets shall cover at least 95% of total scope 3 emissions. Exclusions in the GHG Inventory and target boundary must not exceed 5% of total scope 3 emissions.*	This criterion is a more comprehensive boundary of a company's Scope 3 value chain emissions in comparison to the near-term science-based target criteria.

5.3 Beyond value chain mitigation

"Beyond value chain mitigation" refers to mitigation action or investments that fall outside a company's value chain. Although the SBTi is currently undertaking further work to understand its role in incentivising beyond-value chain mitigation (see Section 1.3), a recommendation and a criterion have been provided to guide companies in developing net-zero strategies.

Table 11 Beyond value chain mitigation draft recommendation & criterion, and description

Criteria / recommendation	Description
NZ-R2. Beyond value chain climate mitigation *The SBTi recommends that companies undertake actions or make investments outside their own value chains to mitigate GHG emissions in addition to their near-term and long-term science-based targets. For example, a company could provide annual support to projects, programs and solutions that provide quantifiable benefits to climate, especially those that generate additional co-benefits for people and nature.*	Companies must prioritise reducing their own value chain emissions, however, the SBTi recommends that companies to go beyond their science-based targets to further mitigate climate change by undertaking actions or making investments that support climate, especially those that generate additional co-benefits for people and nature. This includes measures that avoid or reduce greenhouse gas emissions, or measures that remove and store greenhouse gases from the atmosphere. Examples include purchasing high-quality, jurisdictional REDD+ credits that support countries achieving their nationally determined contributions or direct air capture (DAC) and geologic storage. The SBTi is undertaking further research to understand its role in incentivising these actions and investments as further detailed in Section 1.3.
NZ-C13. Neutralisation of unabated emissions to reach net-zero *Companies must remove carbon from the atmosphere and permanently store it to counterbalance the impact of any unabated emissions that remain once companies have achieved their long-term science-based target, and thereafter.*	The SBTi defines "neutralisation" as measures that companies take outside of their value chain to permanently remove carbon from the atmosphere and store that carbon in geologic or land-based carbon pools. Furthermore, systems must be in place to address any storage reversals that may occur if a material risk exists. Neutralisation should be used to address residual emissions in a company's inventory when the long-term science-based target is achieved to reach net-zero. We expect most companies to make emission reductions of at least 90% to reach net-zero, leaving only a maximum of 10% of a

	company's base year emissions to be addressed through neutralisation. Companies must plan to neutralise all unabated emissions with permanently removed carbon when their long-term science-based targets are achieved. Neutralisation is not intended to lessen the need for companies to abate value chain emissions at a minimum determined science-based rate. See "5.2.2 Long-term SBT ambition". Before further guidance is released on neutralization, companies should prioritize near term target abatement actions and then beyond value chain actions toward securing and enhancing carbon sinks (terrestrial, coastal and marine, etc.) and developing and expanding removals technologies. After the long-term SBT is achieved, companies are expected to continue to neutralise any remaining emissions, until those emissions are completely eliminated. The SBTi is undertaking further research to understand its role in incentivising these actions and investments as further detailed in Section 1.3.

5.4 Target formulation and reporting criteria

Net-zero targets involve several components that demonstrate leadership separately and in combination. While companies are free to decide the best way to express their targets in promotional work, both stakeholders and companies benefit from public access to standardized information on targets and environmental performance.

This section specifies how targets must be formulated and how companies are required to report on progress against targets. The criteria in this section specify target wording, which reflects important target information that must be made publicly available.

Please note that these criteria are supplementary to the current SBTi Criteria. Please see Section VII Reporting (page 14) and Section VIII Recalculation and Target Validity (page 15) for requirements and recommendations relevant to this section.

Table 12 Target Formulation and Reporting draft criteria and description

Criteria / recommendation	Description
NZ-C15. Target formulation: complete net-zero target *Companies shall publicly set a net-zero target, that clearly indicates the magnitude of emissions reductions that will be achieved. Science-based targets shall include a base year that is used to assess progress against the target.* *If a near-term SBT is required by NZ-C2, companies shall publicly set an SBT meeting all SBTi Criteria and criteria in near-term Science-based Targets.*	**Example of overarching net-zero target:** Company A commits to reach net-zero greenhouse emissions across scopes 1, 2, and 3 by 2040 from a 2020 base year. As part of this commitment, the company commits to reduce absolute emissions 50% by 2030 and 90% by 2040. A company is not required to set a near-term science-based target if its long-term science-based target has a timeframe of 10 years or less.
NZ-C16. Reporting completeness *Companies shall publicly report information pertaining to progress against validated targets, including separately reporting emissions and removals in the annual GHG Inventory, as specified by current SBTi Criteria.*	Accounting for carbon removals will largely be addressed by the GHG Protocol Land Sector and Removals Initiative. Due to the challenge of developing criteria while that project is still ongoing, further refinement of criteria will likely be needed in the future. This criterion requires companies to annually report key information related to progress against targets, in line with GHG Protocol requirements.

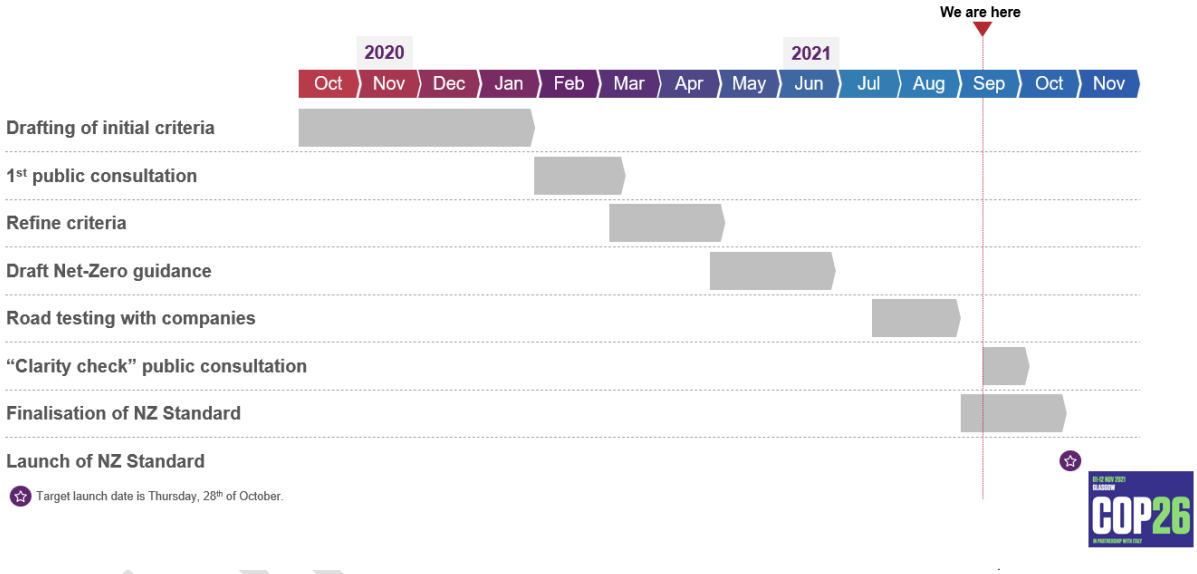
Part 6: Next steps

The SBTi would like to thank you for participating this public consultation on the new Net-Zero Standard. Your input is highly valued. Only with your feedback can the SBTi provide clear and practical guidance to companies on how to align with what climate science tells us is necessary to reach global net-zero before 2050.

After you have reviewed the supporting materials, we would like to understand your views on certain key topics via this survey. The survey asks questions on the standard in general, the feasibility, key challenges, and the ease of use of the supporting materials. The survey will be open until the 6th of October.

The SBTi's Net-Zero Standard will be launched before COP26 in October 2021. You can find a summary of our timeline until then below (Figure 9).

Figure 9. Net-Zero Standard project timeline



The SBTi will begin validating net-zero targets in January 2022.

Thank you again; your feedback helps to make the Net-Zero Standard as clear and practical as possible which drives the advancement of a global zero-carbon economy.

Appendix 1: Transitioning to global net-zero in line with climate and sustainability goals

Through the Paris Agreement, parties and signatories committed to "*holding the increase in 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*."

In the years since the Paris Agreement was signed, the imperative to limit warming to 1.5°C has become even stronger. Against the backdrop of increasingly frequent and destructive climate-related disasters, the IPCC Special Report on 1.5°C delivered a harrowing scientific consensus: while impacts to human health, society, and nature associated with 1.5°C of warming are worse than previously acknowledged, the risks associated with *exceeding* 1.5°C are far higher. To minimise these risks, the IPCC SR15 highlights pathways that limit warming to 1.5°C with no or limited overshoot (overshoot <0.1°C).

As described in the IPCC SR15, pathways that limit warming to 1.5°C, with no or limited overshoot, require reaching approximately net-zero CO_2 emissions by no later than 2050, accompanied by rapid declines in non-CO_2 emissions. This is accomplished through rapid and profound transitions in the global energy, industry, urban, and land systems that involve:

- Full or near-full decarbonisation for energy and industrial CO_2 emissions achieving a zero-emission energy supply system by mid-century
- Eliminating CO_2 emissions associated with agriculture, forestry, and land-use
- Deep reductions in non-CO_2 emissions from all sectors
- Removing CO_2 from the atmosphere to neutralize residual emissions and, potentially, to sustain net negative emissions that reduce cumulative CO_2 in the atmosphere over time.

The different system transformations in 1.5°C mitigation pathways occur concurrently and all of them are needed for society to reach net-zero emissions and limit warming to 1.5°C. An understanding of the synergies and trade-offs between different climate change mitigation pathways and sustainable development should also guide climate action. Many such interactions exist. For example, research indicates that exceeding around 100 EJ of bioenergy per year could put unsustainable pressure on available land, food production and prices, preservation of ecosystems, and potential water and nutrient constraints. Some approaches to CO_2 removal also face technical, environmental, and socio-political challenges. These factors suggest that target-setting pathways should minimize residual emissions to avoid "locking in" dependence on CO_2 removal and that demand-side mitigation options such as modal shifts, reduced energy use, and increased circularity should be considered part of climate strategies.

Appendix 2: Sector-specific guidance for long-term SBTs

Sector-specific guidance and methods are currently available for many sectors. All new sector-specific guidance that becomes available will be uploaded to the sector development page on the SBTi website. The SBTi has sector-specific requirements related to the use of target-setting methodologies and minimum ambition levels.

Table 13 Sector-specific guidance for long-term SBTs

Sector	Eligible methods	Guidance/Notes
Power Generation	The intensity convergence method must be used by power generation companies, as specified in the Guidance for Electric Utilities.	Companies in the power sector with scope 3 emissions that represent 40% or more of overall emissions must set an intensity target covering all sold electricity (including purchased and resold electricity in scope 3 category 3), in addition to a target covering power generation in scope 1.
Forest, Land-use & Agriculture (FLAG)	Some companies will be required to set FLAG targets that are separate from their SBTs covering all other emissions. FLAG targets must use the FLAG-sector pathway (absolute targets) or a commodity pathway (intensity targets). Commodity pathways will be available for beef, dairy, pork, chicken, roundwood, rice, soy, palm oil, maize, and wheat. Forestry and timber companies will be required to use the intensity convergence method for roundwood.	The FLAG sector guidance is planned for finalization in March 2022.
Oil & Gas	The SBTi is developing target-setting methods for oil & gas companies and cannot validate targets for this sector before the guidance is completed.	For target validation by the SBTi, “Oil & Gas” includes, but is not limited to, integrated Oil & Gas companies, Integrated Gas companies, Exploration & Production companies, Refining and Marketing companies, Oil Products Distributors, Gas Distribution and Gas Retailers. The SBTi will assess companies on a case-by-case basis to determine whether companies will be classified as Oil & Gas

		companies for SBTi validation, and if so, reserve the right to not move forward with their validation until after the SBTi Oil & Gas sector development has been completed
Fossil Fuel Sale/ Transmission/ Distribution* **This information is only applicable to companies that receive less than 50% of their revenue from fossil fuel sale, transmission, or distribution. For companies that receive 50% or more of their revenue from these activities, please refer to the Oil & Gas section above.*	In addition to guidance for the primary sector, scope 3 targets must be set on scope 3 category 11 "use of sold products" emissions using absolute contraction.	Targets must be set for scope 3 category 11, irrespective of the share of these emissions compared to the total S1+S2+S3 emissions of the company. Separate scope 3 targets may need to be set in this case.
Financial Institutions	The SBTi is developing a net-zero standard for financial institutions and cannot validate targets for this sector before the guidance is completed.	The initiative defines a financial institution as one that engages in investment activities as part of its core functions. These include, but are not limited to, the following: 1. Asset management/asset owners 2. Retail and commercial banking activities 3. Insurance companies (when functioning asset managers) 4. Mortgage real estate investment trusts (REITs) In addition, if at least 5% of a company's revenue comes from activities such as those described above, they would be considered a financial institution.

Transport services (Aviation/ shipping/ trucks/ cars)	When setting long-term SBTs, companies in these sectors are recommended to set absolute or intensity targets using the aviation pathway, maritime transport pathway, or mixed sector pathway (absolute targets only). The target boundary must cover well-to-wheel emissions (WTW), as specified in the SBTi transport resources.	Refer to the SBTi Transport guidance for a description of all transport sub-sectors covered by the SDA Transport tool and to learn about best practices in target-setting for transport activities. *Well-to-wheel boundary (transport services and OEMs):* Companies setting targets for transport-related emissions should cover well-to-wheel emissions (WTW) in their target boundary to accurately capture emissions shifts between the tank-to-wheel (TTW) and the well-to-tank (WTT), for example, due to changes in power train technologies. *Tested vs. Real emissions (OEMs):* Original equipment manufacturers must convert their base year emissions figures for the use-phase of their products into real emissions with the use of global standards when available (e.g., Worldwide Harmonized Light Vehicle Test Procedure - WLTP). In the absence of a normalized test procedure for certain vehicle types, companies are invited to present and justify their own estimates/simulations based on fuel consumption-specific duty cycles to the SBTi.
Transport (Original Equipment Manufacturers/ Automakers)		
Buildings	When setting long-term SBTs, companies in these sectors are recommended to set absolute or intensity targets using the residential buildings pathway, service buildings pathway, or mixed sector pathway (absolute targets only).	Real Estate Investment Trusts (REITs) wishing to set targets must specify if they are a mortgage-based REIT or equity-based REIT. Equity REITs must pursue the regular target validation route for companies. Mortgage REITs must instead utilize the Financial Institutions guidance for setting SBT. The SBTi is in the scoping phase of developing guidance for companies and sectors of the built environment.
Iron and Steel	When setting long-term SBTs, companies in these sectors are	The SBTi is in the scoping phase of developing guidance for

Cement	recommended to set absolute or intensity targets using the iron and steel pathway, cement pathway, or mixed sector pathway (absolute targets only).	companies in the cement and steel sectors.
All other sectors	When setting long-term SBTs, companies in all other sectors are recommended to set absolute targets using the mixed pathway. Sector-specific absolute or intensity targets may be used instead for emissions allocated to a relevant sector.	Companies should allocate emissions to relevant activities as per the Greenhouse Gas Protocol, where guidance is available. Emissions in scopes 1, 2, or 3 allocated to activities with a sector-specific pathway (e.g., steel production) may be covered by a sector-specific absolute or intensity target, except for upstream scope 3 categories where supply-side mitigation is important and not reflected by the pathway.
Chemicals	See “All other sectors”	The SBTi is in the scoping phase of developing guidance for companies in the chemicals sector.
Information and Communication Technology Providers	See “All other sectors”	Optional guidance is available for companies in the ICT sector.
Apparel and Footwear	See “All other sectors”	Optional guidance is available for companies in the Apparel and Footwear sector.

Appendix 3: Further guidance for companies with significant FLAG emissions

The forest, land, and agriculture (FLAG) sectors, also known in the scientific community as the agriculture, forest, and other land use (AFOLU) sector, have been historically difficult to evaluate through GHG accounting and target setting approaches. However, AFOLU represents about 25% of anthropogenic greenhouse gas (GHG) emissions (10–12 $GtCO_2e$ per year) with about half from agriculture and half from land use, land-use change, and forestry (LULUCF)[11]. GHG emissions of the FLAG sector need to be halved by 2050, and at the same time agricultural production is expected to increase 50%[12].

Additionally, the AFOLU sector has the potential to deliver up to 20% of needed mitigation actions from now through 2050, including removals (Griscom et al 2017). Aligning the AFOLU sector with 1.5°C pathways through both reductions and removals is feasible through reduced land-use change, enhanced carbon sinks, reduced agricultural emissions, and reduced overall production through demand shifts.

Many companies with land-intensive operations have committed or set targets through SBTi, and many are also reporting their emissions publicly. Despite this, few companies account for AFOLU emissions or removals in their targets or disclosures. A key barrier is the lack of available standards, methods and data availability. Land sector emissions ("biogenic carbon") accounting and target setting are being standardised through two key projects led by SBTi partner organisations, and as a result many companies will be addressing these emissions for the first time.

Land sector guidance is evolving

WWF, a founding member of SBTi, is developing specific emission reduction pathways for companies with land sector emissions in their supply chains through the SBTi Forest, Land and Agriculture (SBTi FLAG) project. The outputs of this project will allow companies to set science-based targets that fully incorporate deforestation and land-related emissions. This guidance is aimed at companies in land-intensive sectors, which includes sectors such as food, agriculture and forestry.

These new pathways will include not only emissions reduction, but also removals *within* the land sector. It includes an overall AFOLU sector mitigation pathway as well as 10 specific mitigation pathways for major commodities: beef, chicken, dairy, corn, palm oil, pork, rice, soy, wheat, and wood fibre.

In parallel and in coordination, The Greenhouse Gas Protocol is undertaking a process to develop new guidance on the land sector and removals. New comprehensive guidance on accounting and target setting for land-based emissions means that companies have a new

[11] Roe, S., Streck, C., Obersteiner, M. et al. Contribution of the land sector to a 1.5 °C world. Nat. Clim. Chang. 9, 817–828 (2019). https://doi.org/10.1038/s41558-019-0591-9

[12] https://research.wri.org/sites/default/files/2019-07/WRR_Food_Full_Report_0.pdf

opportunity, and requirement, to bring both emission reductions and removals in the land sector into their mitigation targets.

While GHG Protocol guidance for land sector emissions is under development, we recommend the following guidance documents in the interim in Table 8 below.

Table 14 Additional guidance documents for calculating FLAG emissions

Publisher	Document
GHG Protocol	• Corporate Standard • GHG Protocol Scope 3 Standard • Product Standard • Agriculture Guidance • LULUCF project guidelines • Brazil forestry tool
IPCC	• Guidelines for National GHG Inventories. • 2006 Guidelines, Good Practice Guidance for LULUCF • 2019 Refinement
ISO	• ISO 14064 1:2018
Quantis	• Accounting for Natural Climate Solutions Guidance
Gold Standard	• Value Change Initiative

What counts towards FLAG emissions?

For FLAG target setting, all land-based emissions are included, encompassing

The GHG Protocol guidance will provide information to companies on how to account for and report the following activities in their greenhouse gas inventories:

- Land use and land-use change
- Carbon removals and storage
- Bioenergy and other biogenic products
- Related topics

How can you determine if your company's FLAG emissions are significant?

Land-use intensive companies in the food and beverage, agriculture or forest sectors, and companies downstream of these sectors (i.e., when companies purchase products from these sectors), typically have significant FLAG emissions. Companies in the infrastructure, construction, apparel, and real estate sectors may also have significant impacts and opportunities related to FLAG.

FLAG target-setting will eventually become a requirement for companies with significant land sector emissions that wish to set science-based targets. The SBTi will determine the materiality threshold of what is considered significant in advance of this requirement coming into play.

What options are available for your company to set FLAG emission reduction targets?

For near-term science-based targets

The SBTi FLAG project, which will provide tools and guidance for companies to set near-term SBTs, will be completed by March 2022. In the meantime, companies that wish to set near-term science-based targets on FLAG emissions may opt to use the absolute contraction approach for all emissions (including FLAG emissions).

As mentioned previously, FLAG target-setting will eventually become a requirement for companies with significant land sector emissions that wish to set science-based targets.

For long-term science-based targets

If your company has already calculated emissions from FLAG activities, please see 4.5.2 Calculating long-term SBTs.

Appendix 4: Updating and communicating targets

The number of businesses committing to reach net-zero emissions has rapidly grown over the last two years, and the SBTi understands that many companies have already made commitments to net-zero in advance of the launch of the Net-Zero Standard[13]. The below guidance is designed to help you align existing commitments with the Net-Zero Standard and communicate these changes with stakeholders.

How can you ensure your near-term targets align with the Net-Zero Standard?

As described in the section on changes to near-term SBT criteria, the SBTi is updating its guidance and ambition based on the latest climate science to ratchet ambition up to 1.5°C for all companies. 1.5°C-aligned targets are now the most common choice for businesses, representing 51% of all approved targets and 66% of all submissions to the SBTi in 2021[14]. The new strategy is being rolled out in response to increasing urgency for climate action and the success of science-based targets to date. Because of this, near-term targets that do not align with 1.5°C will no longer be accepted as of July 15, 2022.

Please review the updated requirements for near-term science-based targets (see Table 1). It is important to note that companies must meet these new requirements for near-term science-based targets to gain approval for long-term science-based targets and overarching net-zero commitments. Companies that already have approved targets will not be required to update their targets to meet the new reduced timeframe requirement.

For companies with emission reduction targets that do not already align with the changes to near-term SBT criteria, we invite you upgrade or submit your science-based target. Companies may also follow a simplified voluntary ambition update process to if they meet certain conditions. More information can be found on our website and in the Target Validation Protocol document.

How can you ensure you long-term targets align with the Net-Zero Standard?

An essential component of a corporate net-zero strategy is a long-term science-based target. While companies may reach a balance between emissions and removals before they reach the depth of decarbonisation required to limit warming to 1.5ºC, this is only a transient state on the journey to net-zero emissions. Companies must reduce emissions to this level before claiming to have reached net-zero. In other words, a company's net-zero target date may not come before its long-term science-based target date.

For companies that have not set long-term emission reduction targets, we encourage you to model long-term SBTs and validated them through the SBTi to demonstrate commitment to aligning with science as part of your net-zero ambition.

[13] Analysis by Climate Action Tracker tells us that 73% of global emissions are covered by net-zero targets, and the ECIU and Oxford's March 2021 report showed that, of the 2,000 publicly-traded companies included in the Forbes Global 2000 list, 21% of these companies had net-zero targets.

[14] Figures correct at the time of writing in July 2021.

For companies that have set long-term emission reduction targets to reach net-zero that are not as ambitious as long-term SBTs, we recommend that you model long-term science-based targets, revisit your implementation strategy and consider increasing the ambition of your current long-term targets to align with science.

For companies that have set net-zero target dates but feel they will be unable to reach the level of emission reductions required by their long-term SBT in that timeframe, we would urge companies to review their implementation strategies to explore additional opportunities to reduce emissions as a first step. If you expect that you will not be able to meet the required level of emission reductions by that date, the next option is to consider moving the target date of your net-zero commitment further into the future.

How to communicate with stakeholders when net-zero targets do not meet the Net-Zero Standard requirements

We understand that when companies have already set net-zero commitments, navigating communication with stakeholders can be challenging if the targets do not comply with the Net-Zero Standard. In this section, we provide advice and guidance on how to communicate with stakeholders in this situation.

We have developed some key messages to support companies with this process below. Please note that these are only suggestions and companies may adapt these points to suit their needs.

- To be confident that our actions are in line with climate science and mitigate the risk of following a pathway that may not be consistent with addressing the climate crisis, we have reviewed our net-zero targets against the SBTi's Net-Zero Standard.
- As part of this process, we have identified clear next steps to adjust our current commitment and/or target(s) to align with this first global science-based Net-Zero Standard. We believe this will help us ensure the robustness and impact of our targets.
- Responding to the urgency and scale of the climate emergency, the SBTi is ratcheting up its expectations for businesses. To support this, we must listen to the science and enhance the ambition of our net-zero commitment.
- We are committed to following a science-based net-zero pathway, and as part of this, we are reviewing our climate mitigation strategy to understand opportunities to enhance our ambition.

Appendix 5: Acronyms

AFOLU	Agriculture, Forest and Other Land Use
CDR	Carbon Dioxide Removal
COP	Conference Of the Parties
EAG	SBTi Net-Zero Expert Advisory Group
FLAG	Forests, Land-use and Agriculture
GHGs	Greenhouse Gases
GMST	Global Mean Surface Temperature
IPCC	Intergovernmental Panel on Climate Change
LT SBT	Long-term Science-Based Target
LULUCF	Land-use, Land-use change and Forestry
NBS	Nature-based Solutions
NT SBT	Near-term Science-Based Target
SR15	IPCC Special Report on 1.5˚C
SAG	SBTi Scientific Advisory Group
TAG	SBTi Technical Advisory Group
UNEP	The United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

Appendix 6: Glossary

Term	Definition	Comments
Abatement	Measures that companies take to prevent, reduce or eliminate sources of GHG emissions within their value chain. Examples include reducing energy use, switching to renewable energy and retiring high-emitting assets.	Also see: • Decarbonization
Absolute contraction	Method used to calculate absolute emissions reduction targets that requires organizations to reduce annual emissions by an amount consistent with underlying mitigation pathways.	Also see: • Science-based target methods
Bioenergy	Energy generated from the combustion of biomass. In certain cases, bioenergy is considered "carbon neutral" because combustion-related CO_2 emissions are balanced by CO_2 that is sequestered during the growth of bioenergy feedstock.	
Biomass emissions	Organic material both aboveground and belowground, and both living and dead, e.g., trees, crops, grasses, tree litter, roots etc. Biomass includes the pool definition for above - and below - ground biomass.	
Carbon Dioxide Removal (CDR)	According to the Intergovernmental Panel on Climate Change (IPCC), "anthropogenic activities removing CO_2 from the atmosphere and durably storing it in geological, terrestrial, or ocean reservoirs, or in products". The removals are either nature-based, geological or a hybrid.	
Climate change mitigation	According to the Intergovernmental Panel on Climate Change (IPCC), "a human intervention to reduce emissions or enhance the sinks of greenhouse gases."	Also see: • Corporate Climate Mitigation Blueprint Mitigation strategy
Compensation	Measures that companies take to prevent, reduce or eliminate sources of GHG emissions outside their value chain. Examples include purchasing carbon credits and providing direct finance to climate mitigation programs.	This term is under review and is being used as a placeholder. Also see: • GHG emissions • Offsetting • Value chain emissions
Corporate climate targets	Goals set by a corporation to reduce the corporation's impact on the climate. Targets may include a variety of climate forcers across different corporate activities (i.e., operations, value chain,	Also see: • Abatement • Compensation • Neutralisation

	or products) and may use emissions abatement, compensation, or neutralisation	
Decarbonization	The process by which CO_2 emissions associated with electricity, industry, and transport are reduced or eliminated.	Also see: • Abatement
Emissions (or GHG) inventories	According to the GHG Protocol, a "quantified list of an organization's GHG emissions and sources." Emissions inventories typically include emissions in scopes 1, 2, and 3.	Also see: • Scope 1 inventory • Scope 2 inventory Scope 3 inventory
Forests, land and agriculture (FLAG) emissions	GHG emissions from Forestry, Land use and Agriculture. Examples of key sources of FLAG emissions include deforestation, forest & grassland fires enteric fermentation, fertilizers, manure management and rice cultivation Reducing FLAG emissions, as well as enhancing land-related carbon sinks through activities such as reforestation, is an important climate change mitigation opportunity.	Other similar related terms are Agriculture, Forestry and Other Land uses (AFOLU) and Land-use, Land-use change and Forestry (LULUCF; AFOLU + agriculture GHGs)
Global emissions budget	A cumulative emissions threshold that must not be exceeded to limit global temperature rise by a specified amount and probability. Emissions budgets can be determined for CO_2 only or all greenhouse gases (GHGs).	Also see: • Greenhouse gases • Paris Agreement
Greenhouse gases (GHGs)	Gases which absorb and re-emit infrared radiation, thereby trapping it in Earth's atmosphere. Includes carbon dioxide (CO_2), water vapor, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).	
Greenhouse Gas (GHG) emission reduction targets	Goals set by an organization to reduce direct or indirect emissions by a specified amount	Also see: Greenhouse Gas emissions
Insetting	Insetting is used to describe projects that are wholly contained within a Scope 3 supply chain boundary of a company, a project partially within their Scope 3 supply chain boundary (spanning their supply chain and other companies' supply chains) and a project adjacent to a supply chain boundary.	There are multiple definitions for the term "insetting" in use and no standardization of the term.
Intensity convergence	Method used to calculate emissions intensity targets based on the principle of converging to a sector-wide physical emissions intensity in a future year of a mitigation pathway.	Also see: • Science-based target methods • Physical emissions intensity
Intergovernmental Panel on Climate Change (IPCC)	United Nations body for assessing the science related to climate change	Also see: IPCC Special Report on 1.5°C (SR15)

Long-term science-based target	GHG reduction targets that are in line with what the latest climate science deems is necessary to reach net-zero at the global or sector level in 1.5°C pathways before 2050.	
Near-term science-based target	GHG reduction targets that are in line with what the latest climate science deems necessary to limit warming to 1.5°C above pre-industrial levels and are achieved within a 5–10-year timeframe from the date of submission.	
IPCC Special Report on 1.5˚C (SR15)	A Special Report requested by the United Nations on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. The report includes over 6,000 scientific references and was prepared by 91 authors from 40 countries	Also see: • Paris Agreement • Pre-industrial levels
Mitigation strategy	A set of measures planned by a company to mitigate GHG emissions that may include abatement, insetting, compensation and neutralisation.	Also see: • Mitigation • Abatement • Insetting • Compensation • Neutralisation
Nature-based Solutions (NBS)	The WWF defines NBS as “Ecosystem conservation, management and/or restoration interventions intentionally planned to deliver measurable positive climate adaptation and /or mitigation benefits that have human development and biodiversity co-benefits managing anticipated climate risks to nature that can undermine their long-term effectiveness.”	Also see • Carbon-dioxide removal • Neutralisation • Insetting
Net-zero	Setting corporate net-zero targets aligned with meeting societal climate goals means (1) achieving a scale of value chain emissions reductions consistent with the depth of abatement at the point of reaching global net-zero in 1.5˚C pathways and (2) neutralising the impact of any residual emissions by permanently removing an equivalent volume of CO_2.	Also see: • Residual emissions
Neutralisation	Neutralisation with regards to GHG emissions are the measures that companies take (inside and outside of the value chain) to remove carbon from the atmosphere to counterbalance the impact of a source of emissions that remains unabated.	Also see: • Nature-based Solutions • Carbon credits • Carbon dioxide removal (CDR)
Residual emissions	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	Also see: • Paris Agreement

	in 1.5°C-aligned mitigation pathways with low or no overshoot.	
Science-based targets (SBTs)	Targets that are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement – to limit global warming to well-below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C	Also see: • Near-term science-based targets • Paris Agreement • Pre-industrial levels
Science-based target methods	Methods used to calculate science-based targets from a mitigation pathway, company input variables, and an allocation formula.	Also see: • Absolute contraction • Intensity convergence
SBTi Net-Zero Expert Advisory Group (EAG)	Advisory body to the SBTi consisting of representatives from civil society organizations, corporate climate action initiatives, research agencies, and other stakeholders that contribute specifically to the development of the Net-Zero Standard.	
SBTi Scientific Advisory Group (SAG)	Advisory body to the SBTi consisting of recognized experts in climate change mitigation, integrated assessment modelling, energy system and land-use dynamics, and other topics that contribute to developing the SBTi's scientific foundations.	
SBTi Technical Advisory Group (TAG)	Advisory body to the SBTi consisting of practitioners and experts in topics such as corporate sustainability, greenhouse gas accounting, and target-setting that provide invited feedback on SBTi methods, criteria changes, and guidance.	
Scope 1 emissions	Defined by the GHG Protocol accounting standard as "A reporting organization's direct GHG emissions"	Also see: GHG emissions.
Scope 2 emissions	Defined by the GHG Protocol accounting standard as "A reporting organization's (indirect) emissions associated with the generation of electricity, heating/ cooling, or steam purchased for own consumption"	Also see: GHG emissions
Scope 3 emissions	Defined by the GHG Protocol accounting standard as "A reporting organization's indirect emissions other than those covered in scope 2"	Also see • GHG emissions • Scope 2 inventory

The Paris Agreement	Stated by the UNFCCC, the Paris agreement is a "legally binding international treaty on climate change. It was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016. Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels"	Also see: Pre-industrial levels
Physical emissions intensity	A metric describing the emissions per physical unit of an activity (e.g., cement production). The intensity convergence method is based on the principle that all companies in a sector will converge to the same physical emissions intensity in a future year of mitigation pathways.	Also see: • Decarbonization • Pre-industrial levels Paris Agreement
United Nations Climate Change Conference (2021: COP26)	The annual Conference of the Parties brings together the 197 countries (Conference of the Parties, COP) that have ratified the United Nations Framework Convention on Climate Change (UNFCCC). As the twenty-sixth such gathering, it is known as COP26 and will take place in Glasgow in November 2021. The United Nations Environment Programme (UNEP) states that "Under the Convention, nations have reached two key agreements on reducing greenhouse gas emissions: the Kyoto Protocol adopted in 1997, and the Paris Agreement adopted in 2015. The Paris accord is built around so-called "nationally determined contributions" as a means of achieving the goal of limiting the global temperature increase, and to step up those contributions over time"."	Also see: Paris Agreement
Value-chain emissions	A company's scope 1, 2, and 3 emissions as defined by the GHG Protocol accounting standard	Also see: • Scope 1 inventory • Scope 2 inventory • Scope 3 inventory