

Science Based Targets

Science-based climate targets as the basis for a corporate climate strategy

DISCUSSION PAPER



Global Compact
Network Germany



1. CONTEXT

Facts from climate science

Climate change is one of the most pressing issues of our time and is now more than ever a major concern in the global economy. Global warming and global efforts to limit warming are changing the economic landscape, and can result in considerable risks for businesses, but can also create opportunities for business development. The 5th Special Report of the Intergovernmental Panel of Climate Change (IPCC) published in 2018 outlines and compares the worsening effects of climate change in global warming scenarios of 1.5°C and 2°C based on robust climate models and emphasises the importance of striving to limit global warming to 1.5°C.¹ In 2021, the IPCC's Working Group I (the Physical Science Basis) released a publication as part of the 6th Assessment Report, alarming code red for human-kind and reinforcing the insights presented in 2018. The report phrases that the likely range of total human-caused global surface temperature increase from 1850–1900 to 2010–2019 is 0.8°C to 1.3°C, with a best estimate of 1.07°C (A.1.3).² At this stage of global warming, drastic consequences of climate change are already being observed, and with every further degree of temperature rise the effects become significantly worse. Staying under the 1.5°C threshold would significantly lower climate-related risks and irreversible damage to natural habitats, ecosystems and biodiversity and would keep the costs of adapting to climate change in the economy, health care and social systems within reasonable limits.

The IPCC introduced the concept of a dynamic global "carbon budget". It determines the maximum amount of cumulative global CO₂ emissions from the combustion of fossil fuels and industrial processes since the start of industrialisation that can be released into the atmosphere before crossing a certain threshold of global warming.³ Based on the current scientific insights, the emissions released into the Earth's atmosphere cannot exceed 400 gigatonnes (Gt) of CO₂ to stay below the 1.5°C (> 67%) threshold, with a starting point of 2020. Currently, the annual CO₂ emissions – from burning fossil fuels, industrial processes and land-use change – are estimated to be 42.2 Gt per year and with emissions staying constant at this rate, the global carbon budget to stay below the 1.5°C (> 67%) threshold is expected to be exhausted in less than eight years. In the same scenario, a hypothetical 25 year remain to limit global warming to 2°C (> 67%).⁴

The **Peer Learning Group Climate** was launched in 2015 by the UN Global Compact Network Germany. It consists of 10-12 companies from various sectors, including retail, energy, chemical/pharmaceutical, service and technology. During webinars and in-person meetings, experts from large German companies exchange their experiences with corporate climate action and work together to develop good practices and concrete solutions. Once per year the group meets with up to 30 peers to exchange on a European level. Technical experts support the working group by providing expert knowledge and moderating the meetings. To date, the group has covered topics such as ambitious climate strategies, scope 3 materiality assessment and data collection, supplier engagement, climate risk analysis and science-based targets. This discussion paper focuses on the latter. It has been updated from its 2019 version following the release of updated SBTi criteria (v5.0) and guidance in late 2021.

Paris Agreement

In 2015, at the 21st United Nations Climate Change Conference (COP 21), the international community adopted the Paris Agreement. With this legally binding agreement, the international community has committed to limiting global warming to well below 2°C compared to pre-industrial temperatures and to pursue efforts to limit global warming to 1.5°C. Achieving the goals of the Paris Agreement will require a decisive contribution from the business sector. In this context, more and more companies explicitly consider the question of how to fulfill their contribution to limiting global warming when revising their climate action strategy.

1 IPCC (2018) – Special Report on Global Warming of 1.5°C.
www.bit.ly/ipccspecialreport15

2 IPCC (2021) – Climate Change 2021. The Physical Science Basis.
www.bit.ly/ipccreport2021

3 The budget deliberately refers to CO₂ emissions and not GHG emissions. Greenhouse gases other than CO₂ such as methane and sulphur dioxide must also be drastically limited in order to successfully meet the 1.5°C limit.

4 The Mercator Research Institute on Global Commons and Climate Change (MCC) uses a "CO₂ clock" to illustrate how much of the carbon budget specified by the IPCC for compliance with the 1.5°C and 2°C temperature thresholds is still available.
www.bit.ly/carbon-clock

Science Based Targets initiative (SBTi)

The Science Based Targets initiative (SBTi) is a partnership between the CDP, the United Nations Global Compact, the World Resources Institute (WRI) and the World Wide Fund for Nature (WWF) and is one of the We Mean Business Coalition commitments.⁵ The initiative encourages ambitious corporate climate action with resources that allow companies to set science-based targets and make their critical contribution to limit the worst effects of global warming. A corporate GHG emission reduction target is considered to be "science-based" if it is aligned with what the latest climate science says is necessary to meet the goals of the Paris Agreement. The initiative aims to make science-based targets (SBTs) for the reduction of GHG emissions a standard business practice and a common language for credible corporate climate action.

To this end, the SBTi provides companies with an overview of available methodologies for setting SBTs and further develops and updates resources on an ongoing basis. On 15th July 2021 the SBTi announced their ambitious new strategy in an urgent call to action and the goal to streamline 1.5°C targets as the new standard level of ambition, which is in line with the recent increase of corporate, investor and public awareness on climate change.⁶ This increase in ambition is reflected in the status update for the "Business Ambition for 1.5°C" - Campaign⁷, the SBTi criteria (v5.0) update for setting near-term targets and the release of the first ever Net-Zero Standard for setting long-term emission reduction targets.

The focus of this discussion paper is on science-based near-term targets (5-10 year timeframe) which however do serve as a requirement for the development of long-term net-zero targets.⁸

The SBTi also offers a validation service as well as an on-line platform for effective public communication of SBTs. As of the start of June 2022, more than 1400 companies have set validated science-based targets⁹ and many more have publicly announced their commitment to set SBTs within a two-year timeframe. From 15 July 2022, companies may only submit climate targets to SBTi that are consistent with the revised target validation criteria and methods, of which the main changes are summarised in Table 1.

Peer Learning Group Climate

Since 2017, participating companies of the Peer Learning Group Climate of the German Global Compact Network have been exploring the challenges of developing science-based targets and discussed various approaches, methodologies and applications also directly with representatives from the SBTi. On several occasions, the group examined the topic within the European Peer Learning Group – last in February 2022 to exchange on first experiences with the new Net Zero Standard of the SBTi. This paper makes the core findings of this process available to a broader audience and opens them up for discussion.

5 Science Based Targets Initiative (2022). www.bit.ly/Science-based-targets

6 Science Based Targets Initiative (2021). Our Ambitious New Strategy. www.bit.ly/SBTi-strategy

7 Science Based Targets Initiative (2022). Business Ambition for 1.5°C. www.bit.ly/SBTi-15ambition

8 Science Based Targets Initiative (2021). Net-Zero Standard. www.bit.ly/SBTi-NetZeroStandard

9 Science Based Targets Initiative (2022). Companies taking action (visited on 03/06/2022). www.bit.ly/SBT-CompaniesTakingAction

10 Science Based Targets Initiative (2021). Net-Zero Standard, p. 36. www.bit.ly/SBTi-NetZeroStandard

GENERAL RECOMMENDATIONS:

- 1) Level of ambition:** In order to make a meaningful contribution to tackle climate change, companies can set science-based emission reduction targets aligned with the latest climate science. For science-based near-term targets to be recognized by the SBTi under the recent v5.0 criteria update, the level of ambition for Scope 1 & 2 has to align with the level of decarbonisation required to limit global warming to 1.5°C and for scope 3 targets to a well-below 2°C scenario
- 2) Interpreting the results:** The development of science-based climate targets offers a valuable starting point for the development of a corporate climate action strategy. These targets show what it takes to comply with the 1.5°C threshold at the company level, require to track (and disclose) performance against on an annual basis and identify to what extent existing measures can contribute to the chosen level of ambition.
- 3) Criteria for target setting:** An official approval of science-based targets by the SBTi provides a clear benefit for corporate communication. The criteria specified by the SBTi offer helpful orientation when formulating climate targets and the complementary Target Validation Protocol lays out a transparent and consistent approach to the target validation process. What's more, even if an official target validation by the SBTi is not desired, existing company targets can still be used as benchmarks of current good practice and for inspiration.
- 4) Scope 3 emission targets:** If scope 3 emissions constitute more than 40% of the total corporate carbon footprint, the SBTi requires to set an ambitious target that covers at least two-thirds of scope 3 emissions. Scope 3 emissions are often greater than scope 1 & 2 emissions and can play an integral part in a corporate GHG emissions reduction strategy, however can be challenging to address as these emissions are not under the direct control of the reporting company. It can be helpful to begin with a high-level screening of scope 3 emissions to identify high-impact categories, and strategically decide where more accurate data is required or where targets could be set directly







Criterion	Updates to criteria
 Timeframe 	Under the previous versions of the SBTi criteria, near-term science-based targets could have a target year 5-15 years from the date of submission. Under V5 of the SBTi criteria, target years must be 5-10 years from the date of submission.
1 2  Scope 1 & 2 ambition 	The minimum scope 1 and 2 ambition of near-term science-based targets has increased from well-below 2°C to 1.5°C
3  Scope 3 ambition 	The minimum scope 3 ambition of near-term science-based targets has increased from 2°C to well-below 2°C. Supplier engagement targets will remain eligible.

Table 1: Summary of main changes to near term SBTi criteria¹⁰

2. CHALLENGES AND QUESTIONS

Developing science-based targets in line with established methodologies

The SBTi has established standard target setting methods, criteria and sector-specific guidance which are updated on a regular basis and provide companies with the current best practice. The initial task of evaluating the full range of available target setting methods, understanding their logic and assumptions and choosing the most suitable method for a company and its sector can be challenging. Moreover, once a method has been selected, questions may arise around the practicalities of applying it.

Interpreting the resulting targets set with the SBTi methods

SBTi methods allow companies to calculate science-based reduction pathways for their scope 1, 2 and 3 emissions in line with 1.5°C. From this, the question arises of how to best evaluate findings from applying the SBTi methods, and what steps can be taken to achieve company-wide adoption of a climate target. This is especially true for companies running comparisons of different science-based target methods, as these tend to produce varying results. To make a meaningful interpretation, companies also need to track their emission reduction performance against a science-based target.

Official approval of science-based targets by the SBTi

To achieve a validated science-based target, companies are required to adhere to the SBTi target setting criteria (which are updated annually) and sector-specific guidance (where applicable). Identifying and following the relevant SBTi criteria and/or sector requirements can be a challenging process. An incentive for companies to engage in this process is that approved targets are publically displayed on the SBTi website¹¹, and this can help companies with their communication of climate and sustainability ambitions to stakeholders.

Setting approved targets for company scope 3 emissions

The approach to setting science-based targets for scope 3 corporate emissions is particularly challenging. Many companies only have limited access to data on scope 3 emissions and ask how to directly influence GHG emissions in the value chain. The process of initially estimating the materiality of scope 3 emissions through to tracking performance against an SBTi approved target, presents a series of unique challenges. For setting a scope 3 target, companies are required to adhere to the Corporate Value Chain (scope 3) Accounting and Reporting Standard¹² and the SBTi provides an array of methods for setting a science-based scope 3 emission reduction targets.¹³ When starting the process of scope 3 emissions accounting, it is common for companies to start

¹¹ Science Based Targets Initiative (2022). Companies taking action. www.bit.ly/SBT-CompaniesTakingAction

¹² World Resources Institute (2013). Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard. www.bit.ly/ghgp-Scope3AcRepStd

¹³ Science Based Targets Initiative (2021). Corporate Manual, p. 9. www.bit.ly/sbti-corporate-manual

out with an initial scope 3 baseline footprint with low data quality and data quality and the accuracy of the footprint can be improved year-on-year.

Setting long-term/net-zero targets

Companies striving to be innovative in their climate action strategy and make a meaningful contribution to tackling climate change challenges must ask themselves how to best “translate” the globally targeted 1.5°C threshold into corporate level action and policy. In this regard, the term “net-zero” has been gaining increasing attention in the corporate environment and a number of companies claim to have set net-zero targets. However, these targets are not all equal and there seem to be open questions, e.g. around the “net” or how to integrate long-term climate targets into the business model. To tackle these challenges, it is key to work together and there is a need for enablers, such as internal buy-in with support from the top-level management and diversification of solutions and products.

3. POSSIBLE SOLUTIONS

3.1. Developing science-based targets with established methodologies

In order to develop an understanding of what science-based climate targets would mean for a company in the context of developing a climate strategy, they should first become familiar with the available methods for science-based target setting and the assumptions and scientific foundation behind them. SBTi methods comprise of three core components: a carbon or GHG budget, emission scenarios and an allocation approach.¹⁴ These elements bridge the gap between the remaining global emission budget (determined by a given temperature thresholds) and the corporate level.



Figure 1: The three core elements of the SBTi methods

Source: Adapted from the SBTi

Foundations of setting science-based targets

GHG budgets

In determining the remaining global emissions budget, the SBTi does not only consider CO₂ but also other climate-relevant greenhouse gases, as these are relevant for many companies. The SBTi quantifies the remaining GHG budget, meaning it describes the amount of anthropogenic greenhouse gases that can still be emitted before a certain threshold of global warming is reached.

¹⁴ The section on the methodological principles of SBT methods is based on Science Based Targets Initiative (2019): Foundations of Science-Based Target-Setting. www.bit.ly/SBT-Foundations

Emission scenario

Emission scenarios describe a hypothetical future and the path leading to that future. They show potential ways in which emission reductions can be achieved under different socio-economic and political circumstances in order to stay within the remaining GHG budget that corresponds to a set temperature threshold. In some scenarios, cumulative emissions initially overshoot the GHG budget and then must be reduced by a larger amount in later years in order to stay below the respective temperature threshold by 2100.

When developing the absolute contraction method (described in further detail below), the SBTi included 177 emission scenarios from 25 climate models to determine global emission pathways aligned with the Well Below 2°C and 1.5°C temperature thresholds. From the initial set of scenarios, a final 1.5°C envelope of 20 scenarios and a final Well Below 2°C envelope of 28 scenarios had been selected. The selection criteria were, among other things, that the scenarios stay within the respective GHG budget and align with the respective temperature threshold with a specified minimum probability.

Allocation approach

An allocation approach refers to the way the GHG budget underlying a given emission scenario is allocated amongst companies within the same level of disaggregation (e.g. in a region, in a sector or globally). The SBT methods are based on two main allocation approaches:

- **Convergence** means that all companies in a given sector reduce their emission intensity to a common value (e.g. x g CO₂-eq per kWh for all energy suppliers) by 2050 as per the respective scenario. The convergence approach can only be used in **homogenous** sectors with sector-specific emission scenarios and physical activity indicators (e.g. tonnes of greenhouse gas per tonnes of aluminum). Accordingly, the extent to which a company's emission intensity must be reduced by the target year depends on the baseline value in the base year, the company's expected growth relative to that of the sector and the intensity target value for the sector.
- **Contraction** means that all companies reduce their absolute emissions with the same percentage rate between the base year and the target year. This approach does not take into account different emission intensities in the base year.

Approved methods for defining science-based climate targets (scope 1&2)

To set a SBT for scope 1 and 2 emissions two main methods are publically available: the Absolute Contraction approach and the Sectoral Decarbonization Approach (SDA). In the following, an overview of both approaches is presented.

Absolute Contraction Approach

The method of absolute contraction is based on the assumption that global warming can be successfully limited to 1.5°C if all players worldwide reduce their absolute GHG emissions between the base and target year to the extent required by the emission scenarios of this respective temperature threshold. Accordingly, the absolute contraction approach can be applied for companies in all sectors and is suitable for heterogeneous sectors and, unless the SBTi requires the application of a sector-specific approach. It is important to note that targets developed using the absolute contraction approach can also be converted into relative climate targets, which can be useful for the communication of SBTs with external stakeholders. The SBTi, however, evaluates the absolute emission reduction performance when validating targets.

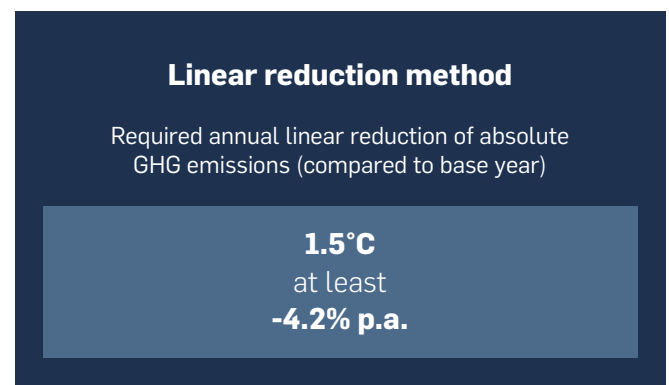
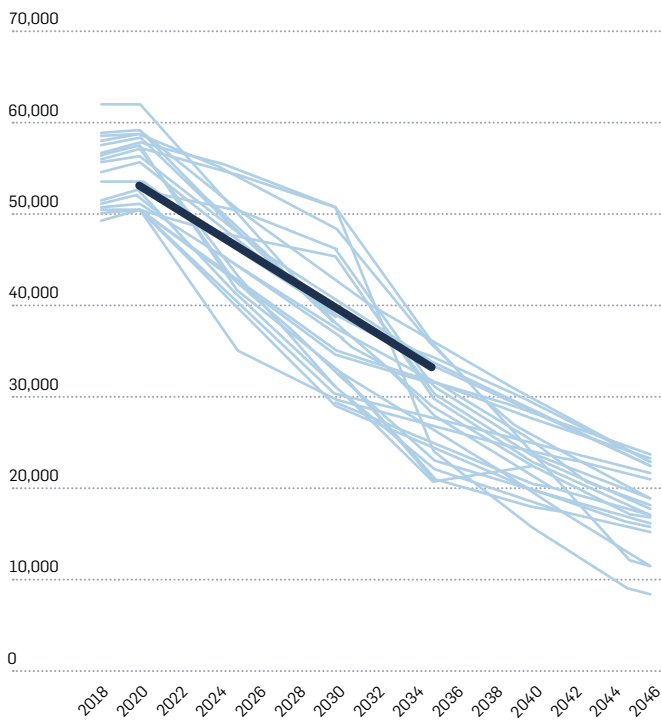


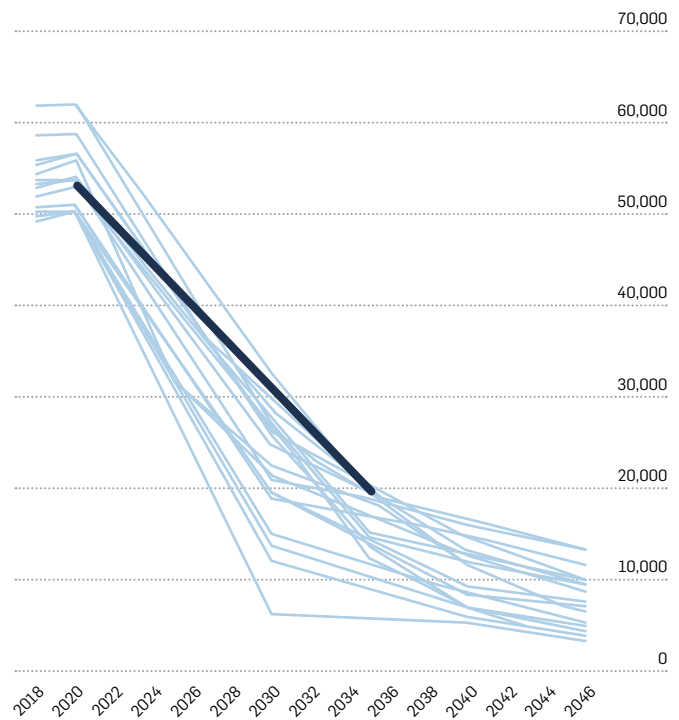
Figure 2: Required annual reduction rates for absolute contraction

Source: Adapted from the SBTi

To determine the absolute emission reduction rate required in each case, the SBTi calculated the median of the emission paths from the 20 1.5°C scenarios and 28 well below 2°C scenarios described below (see Figures 3 and 4). To limit global warming to 1.5°C, GHG emissions must be reduced by an average linear reduction of **4.2% per year** relative to the base year (see Figure 2). For a 2018 base year, this corresponds to an emission reduction of at least 29.4% by 2025 and 50.4% by 2030.

Figure 3: Emission curves of well below 2°C scenarios up to 2050

Source: Own illustration adapted from SBTi

Figure 4: Emission curves for 1.5°C scenarios up to 2050

Source: Own illustration adapted from SBTi

Sectoral Decarbonization Approach

The Sectoral Decarbonization Approach (SDA) is a sector-specific approach for setting emission intensity targets. The SDA assumes global convergence of key sectors' emissions intensity by 2050 consistent with global temperature thresholds of well below 2°C and 1.5°C. An intensity target is defined by a reduction in emissions relative to a company's specific physical activity metric (e.g. tonne CO₂-eq per tonne produced or per square metre of service area). For example, emissions from cement production in any country is assumed to converge against the same emissions intensity metric. Within each sector, companies can derive their science-based target based on their relative contribution to the total sector activity and their initial CO₂ intensity relative to that of the respective sector.

To this end, the SDA utilizes well below 2°C scenarios from the International Energy Agency report Energy Technology Perspectives 2017, which comprises activity and emissions projections of sectoral decarbonization pathways.¹⁵ In recent updates, the SBTi has added 1.5°C-aligned sector pathways for Power Generation, Services Building and Residential Buildings utilizing the 1.5°C scenarios from the International Energy Agency report Energy Technology Perspectives 2020.¹⁶ Currently, the Sectoral Decarbonization Approach can

be applied with the SBT target setting tool to derive emissions intensity scenarios aligned with a 1.5°C¹⁷ or well-below 2°C pathway for the following sectors (activity indicator in brackets)¹⁸:

- ▶ Power generation (MWh)
- ▶ Services – Buildings (m²)
- ▶ Residential Buildings (m²)
- ▶ Iron and steel (metric tons of crude steel)
- ▶ Aluminum (metric tons of aluminum)
- ▶ Cement (metric tons of cement)
- ▶ Pulp and paper (metric tons of pulp and paper)

Separate SBT target setting tools are available for the transport sector to calculate emissions intensity targets for:

- ▶ Passenger and Freight Road Transport¹⁹
- ▶ Road Vehicle Manufacturers²⁰
- ▶ Aviation²¹

¹⁵ International Energy Agency (2017). Energy Technology Perspectives 2017. www.bit.ly/IEA_ETP2017

¹⁶ International Energy Agency (2020). Energy Technology Perspectives 2020. www.bit.ly/iea-perspectives

¹⁷ Science Based Targets Initiative (2021). SBTi Target Setting Tool Version 2.0. www.bit.ly/target-setting-tool-2

¹⁸ Science Based Targets Initiative (2019). SBTi Target Setting Tool Version 1.2.1. www.bit.ly/target-setting-tool-121

¹⁹ Science Based Targets Initiative (2018). SDA Transport Tool v1.1. www.bit.ly/sda-transport

²⁰ Science Based Targets Initiative (2018). SDA Transport Tool for PLDV Manufacturers v1.0. www.bit.ly/SDA-transport-PLDV

²¹ Science Based Targets Initiative (2021). SBTi Aviation Tool. www.bit.ly/SDA-aviation

Tables 2 and 3 provide an overview of the absolute contraction method and the SDA method and describe their main characteristics. More specifically, the underlying allocation mechanism and climate scenario, characteristics of the target definition and a general target classification are detailed.

Method & Developer	Allocation mechanism	Underlying scenario	Characteristics of the defined target	Classification
Absolute contraction method²² Method originally developed by the company Mars; further developed by SBTi (2019)	Contraction	Envelope of emission scenarios from well-established climate models in line with limiting global warming to well below 2°C (28 scenarios) or 1.5°C (20 scenarios)	Logic: <ul style="list-style-type: none"> Absolute contraction applied to all companies leads to the required global GHG emission reductions Annual linear reduction of at least 2.5% relative to the base year to be aligned with limiting warming to well below 2°C Annual linear reduction of at least 4.2% relative to the base year to be aligned with limiting warming to 1.5°C Input data: <ul style="list-style-type: none"> Base year Target year Absolute base year emissions (disaggregated by scopes) Output data: <ul style="list-style-type: none"> Percent reduction between base year and target year Absolute emissions (disaggregated by scope) in each year 	Target type: <ul style="list-style-type: none"> Absolute target May be converted by the company into an intensity target Strengths: <ul style="list-style-type: none"> Well documented scientific background Simple, straightforward approach Applicable for scope 1,2 and 3 Easy to communicate Weaknesses: <ul style="list-style-type: none"> Past GHG emission reduction measures not taken into account

Table 2: Characteristics of the absolute contraction method

Method & Developer	Allocation mechanism	Underlying scenario(s)	Characteristics of the defined target	Classification
Sectoral Decarbonization Approach (SDA)²³ Method developed by the SBTi (2015)	Convergence (homogeneous sectors)	Scenario "Below two degrees" (B2DS) from the IEA ETP (2017) (1.5°C) scenarios from IEA Energy Technology Perspectives 2020	Logic: <ul style="list-style-type: none"> Target defined taking into account sector-specific mitigation potentials and projected growth Input data: <ul style="list-style-type: none"> Base year Target year GHG emissions in base year (disaggregated by scope) Activity in base year (in square meters, tonne output, MWh, etc.) Growth projections until target year Output data: <ul style="list-style-type: none"> Absolute emissions and percentage change of scope 1 & 2 by target year Emission intensity and its percent change for scope 1 & 2 by target year 	Target type: <ul style="list-style-type: none"> Absolute target and/or intensity target Strengths: <ul style="list-style-type: none"> Consideration of specific sector characteristics regarding GHG emission reduction potentials Consideration of past commitments (via intensity) Comprehensive description of the method (2015)²⁴ Continuous development and specification of further sectors Weaknesses: <ul style="list-style-type: none"> Limited suitability for scope 3 emissions Applicable only to selected homogeneous sectors

Table 3: Characteristics of the sectoral decarbonization approach

²² Science Based Targets Initiative (2019): Foundations of Science-Based Target-Setting. www.bit.ly/SBT-Foundations

²³ Science Based Targets Initiative (2019): Foundations of Science-Based Target-Setting. www.bit.ly/SBT-Foundations

²⁴ Science Based Targets Initiative (2019). Sectoral Decarbonization Approach (SDA): A Method for Setting Corporate Emission Reduction Targets in Line with Climate Science. www.bit.ly/SBT-SDA-Report2015

3.1.1. Selecting a suitable method for setting Science Based Targets

With the ongoing release of supportive resources from the SBTi, selecting a suitable method for developing science based targets has become much simpler for companies. The selection of a suitable SBT method primarily depends on the sector the company is active in. Table 4 brings together SBTi

recommendations for selecting a suitable SBT method and minimum ambition requirements for various sectors. To the purpose of further development of available sector pathways, guidances and tools, the SBTi invites companies to participate in their multi-stakeholder processes. The option is to set a near-term target with either the cross-sector pathway (Absolute Contraction) or sector-specific pathways for applicable sectors (SDA).

Sector	SBTi Methods for near-term targets	Guidance + Tools
Apparel and footwear	Absolute contraction 1.5°C	Apparel and Footwear Sector SBT Guidance (Jun 2019) ²⁵ ; SBTi Target Setting Tool v2.0 (Dec 2021)
Aviation	Absolute Contraction 1.5°C or SDA 1.5°C pathway (when available)	Aviation Sector SBT Guidance (Aug 2021) ²⁶ ; SBTi_Aviation_Tool_v1.1 (Oct 2021)
Chemical	Absolute contraction 1.5°C or SDA 1.5°C pathway (when available)	Chemical Sector Guidance in Scoping Phase ²⁷ ; SBTi Target Setting Tool v2.0 (Dec 2021)
Financial institutions	Absolute contraction 1.5°C or relevant SDA pathways (e.g. services/commercial buildings)	Financial Sector SBT Guidance – Pilot v1.1 (Apr 2021) ²⁸ ; Private Equity Sector SBT Guidance v1.0 (Nov 2021) ²⁹ ; SBTi Target Setting Tool v2.0 (Dec 2021)
Forest, Land and Agriculture (FLAG)	Public consultation period ³⁰	FLAG Sector Guidance - Draft (Jan 2022) ³¹
Information and communication technology providers	Absolute contraction 1.5°C or relevant 1.5°C-aligned ICT sector pathways	ICT Sector SBT Guidance (Apr 2021) ³² ; SBTi Target Setting Tool v2.0 (Dec 2021)
Industrial Sectors: Iron and Steel Cement Aluminium Pulp and paper	Absolute Contraction 1.5°C or SDA 1.5°C pathways (when available)	Steel Sector SBT Guidance in development ³³ ; Cement Sector SBT Guidance in development ³⁴ ; Aluminium Sector SBT in Scoping Phase ³⁵ ; SBTi Target Setting Tool v2.0 (Dec 2021)
Oil and gas	The SBTi reserves the right to delay the approval of company targets in the oil and gas sector until the Guidance is launched.	Oil and Gas Sector SBT Guidance in development ³⁶
Original Equipment Manufacturers (OEMs) / Automakers	Absolute Contraction 1.5°C	SBTi Target Setting Tool v2.0 (Dec 2021)
Power generation	SDA 1.5°C pathway (scope 1)	Power Sector SBT Guidance (Jun 2020) ³⁷ ; SBTi Target Setting Tool v2.0. (Dec 2021)
Services/Commercial Buildings	Absolute Contraction 1.5°C or SDA 1.5°C pathway	Building Sector SBT Guidance in Development ³⁸ ; SBTi Target Setting Tool v2.0. (Dec 2021)

25 Science Based Targets Initiative (2019). Apparel and Footwear Sector Science-Based Targets Guidance. www.bit.ly/SBT_Apparel-Footwear

26 Science Based Targets Initiative (2021). Science-based Target Setting for the Aviation Sector. www.bit.ly/SBTi-aviation

27 Science Based Targets Initiative (2019). Chemicals and Petrochemicals. www.bit.ly/SBT_Chemicals

28 Science Based Targets Initiative (2021). Financial Sector Science-based Target Guidance – Pilot Version 1.1. www.bit.ly/SBTi-financial-sector

29 Science Based Targets Initiative (2021). Private Equity Sector Science-based Target Guidance. www.bit.ly/SBTi-private-equity

30 Science Based Targets Initiative (2022). Forest, Land and Agriculture (FLAG). www.bit.ly/SBTi-FLAG

31 Science Based Targets Initiative (2022). Forest, Land and Agriculture Science-based Target Setting Guidance – Draft for Public Consultation. www.bit.ly/SBTi-FLAG-Guidance

32 Science Based Targets Initiative (2020). Guidance for ICT Companies Setting Science-based Targets. www.bit.ly/SBTi-ICT

33 Science Based Targets Initiative (2022). Steel. www.bit.ly/SBTi-Steel

34 Science Based Targets Initiative (2022). Cement. www.bit.ly/SBTi-Cement

35 Science Based Targets Initiative (2022). Aluminium. www.bit.ly/SBTi-Aluminium

36 Science Based Targets Initiative (2022). Oil and Gas. www.bit.ly/SBTi-oil-gas

37 Science Based Targets Initiative (2020). Quick Start Guide for Electric Utilities. www.bit.ly/SBTi-power

38 Science Based Targets Initiative (2022). Buildings. www.bit.ly/SBTi-buildings

Sector	SBTi Methods for near-term targets	Guidance + Tools
Transport services (Passenger and freight transport)	Absolute Contraction 1.5°C or SDA 1.5°C pathways (when available)	Transport Sector SBT Guidance ³⁹ ; Maritime Sector SBT Guidance in Development ⁴⁰ ; SBTi Target Setting Tool v2.0. (Dec 2021)
All other sectors	Absolute contraction	SBTi Target Setting Tool v2.0. (Dec 2021)

Table 4: Recommended method for various sectors according to SBTi guidelines

39 Science Based Targets Initiative (2018). Transport Science-based Target Setting Guidance www.bit.ly/SBTi-transport

40 Science Based Targets Initiative (2022). Transport. www.bit.ly/SBTi-transport-resources

Companies operating in more than one sector may combine different methods when setting a science-based target. For instance, the SDA method may be used to identify specific reduction paths for different segments of a company that fall within a respective sector. For other organisational areas, the absolute contraction method may be applied.

Currently companies in all sectors can have their science-based targets validated by the SBTi, except for companies involved in the exploration, extraction, mining and/or production of fossil fuels (oil, natural gas, coal and others) and those that derive 50% or more of their revenue from activities in the fossil fuel sector. Companies that fall into this category and aspire to set science-based targets will be required to follow the respective sector guidance once published. Companies with less than 50% revenues from fossil fuel sale, transmission, or distribution can set science-based targets, however must include Scope 3 Category 11 ("use of sold products") emissions in their targets. Given that fossil fuel combustion is the single largest source of GHG emissions and therefore needs to be phased-out of the global economy, the SBTi recommends the decommissioning of fossil fuels assets, instead of divestment.⁴¹

The "How-to-Guide for Setting Near-term Targets"⁴² provided by the SBTi can help to understand the steps to be undertaken to the purpose of target setting. Companies that operate in a sector where sector-specific guidance is available, are required to follow respective guidance. In recognition of the challenges related to target setting, the SBTi gives companies a 6-month period to digest changes after new criteria or guidance are released.⁴³ For example, the new SBTi target setting criteria (v5.0) released in December 2021 will come into effect on 15. July 2022.

41 Science Based Targets Initiative (2021). SBTi Criteria v5.0. www.bit.ly/SBTi-criteria

42 Science Based Targets Initiative (2021). SBTi How-To Guide. www.bit.ly/SBTi-guide

43 Science Based Targets Initiative (2021). SBTi Target Validation Protocol. www.bit.ly/SBTi-target-validation

SCOPE 2 – RENEWABLE ELECTRICITY TARGETS

For scope 2 (indirect emissions from energy procurement), the SBTi accepts renewable electricity targets with a threshold of 80% by 2025 and 100% by 2030. Renewable electricity target have to cover at least 95% of scope 2 emissions and target dates between 2025 and 2030 are accepted if they follow the linear progression of 4% between these years. Companies that already meet the threshold can commit to maintain or increase renewable electricity sourcing to qualify.

To align their reduction targets to climate-science, it is important for companies to stay up-to-date and maintain an overview of the relevant resources provided by the SBTi. This also counts even if a target has not yet been set, as this can help companies to build on available best practices in their decarbonization journey. A summary of the current status of sector-specific guidance and emissions reduction pathways is displayed in Table 5. Before completion, each project undergoes a formal review from the SBTi, and it is stated that "all dates are expected (and not binding)".⁴⁴

44 Science Based Targets Initiative (2021). Net-Zero Standard, p. 16. www.bit.ly/SBTi-NetZeroStandard

IPCC-Sector	SBT-Sector	Pathway		Guidance
		near-term	long-term	Guidance documents to support
AFOLU	Forests, land and agriculture (FLAG) pathway	✧ March 2022	☆	○ March 2022
	FLAG commodity pathways	✧ March 2022	✧ March 2022	○ March 2022
Buildings	Buildings	✧ December 2021	☆	∩
Industry	Iron and steel	✧ June 2022	☆	○ April 2023
	Cement	✧ December 2021	☆	○ June 2022
	Chemicals	✧	✧	∩
Transport	Road and rail transport	✧	✧	●
	Maritime transport	✧ January 2022	✧ January 2022	○ January 2022
	Aviation	✧ December 2021	✧ December 2021	●
Other Energy	Oil and gas	✧	✧	∩
Electricity & Heat	Power generation	☆	☆	●
Other Sectors	Apparel and footwear	✧	✧	●
	ICT	✧	✧	●

✧ 1.5°C sector pathway(s) planned

∩ Guidance planned, no timeline available

☆ 1.5°C sector pathway(s) available at Net-Zero Standard launch

○ Guidance release date known

✧ Sector uses cross-sector pathway

● Guidance complete

Table 5: Current status of sector-specific guidance and emission reduction pathways

3.2. Interpretation of SBT method results

Process of target setting in the company

Since the signing of the Paris Agreement in 2015, the pressure on companies from investors, regulators and competitors has risen and the social awareness of climate change has increased significantly. The effects of climate change are already being observed in various regions around the world. As a result, politicians are being increasingly called upon to take action and more and more companies are adopting ambitious climate strategies in line with climate science. As discussed in section 1, it is highly recommended that companies adopt a climate strategy in line with the 1.5°C limit and the latest climate science. Developing science-based GHG emission reduction pathways can provide companies with a solid backbone to build their initial climate strategy. A direct comparison of the GHG reduction pathways determined by a “bottom-up” analysis of potential measures and emission reduction potentials in the company often reveals a “gap” between the project pathways and science-based targets. This suggests that companies need to take additional near-term actions to make

RABEA HABEL-BECK, MEMBER OF THE EXECUTIVE BOARD, LORENZ GROUP

To limit global warming to 1.5°C, all businesses have to play their role and implement credible measures to reduce their environmental footprint. As a family business we deeply care for the future. We have always thought long-term and operated sustainably. That's why we take our responsibility towards climate protection very seriously. Therefore it was a natural step for us to develop a science-based target. The process of development helps our company to translate the latest insights from climate science to our specific context and also to integrate this into our corporate climate strategy. Aligning with a science-based target allows us to communicate our climate ambitions to our stakeholders with confidence.

an effective contribution to limiting global warming and manage their climate-related risks. These measures may look like implementing effective mitigation measures and innovative business models (possibly with longer investment periods) and switching to renewable energy sources.

This requires long-term planning that does not necessarily correspond to the common short management cycles of companies. To estimate longer-term emissions reductions, companies must also try to anticipate technological progress, even though there are uncertainties around assumed trends and if they will actually occur. Ultimately, each company will follow their own particular path in setting longer-term climate targets and developing their climate strategy. In this process, close collaboration between the different company segments and external parties and clear commitment from management is of utmost importance.

Guidelines for interpreting results from the SBTi-methods

In order to keep 1.5°C alive, we need to halve global GHG emissions by 2030. This means we need to see emissions reductions on a massive scale in the near term – and there is no time to lose. This is why 1.5°C-aligned science-based targets are so important - they help to ensure that companies urgently begin reducing emissions now at the pace and scale required to stand a chance of limiting global warming to 1.5°C. To increase this likelihood, actors from industrialized countries in particular must increase their level of ambition. Different SBTi methods produce reduction pathways with different levels of ambition and the SBTi recommends that companies set targets aligned with 1.5°C in the near-term and “net-zero” targets (discussed in section 3.5.) in the long-term.

Setting and tracking the progress of a science-based climate target is a dynamic process. Companies should track and evaluate their status and progress against a science-based target pathway on an ongoing basis, and should also adjust their target, if there is any significant change to the underlying parameters, expectations of company growth or corporate structure. Also, the SBTi reserves the right to update any guidance and criteria in line with the latest insights from climate science.

3.3 Official approval of science-based targets by the SBTi

With the latest v5.0 criteria update in 2021, the bar for setting science-based targets has been raised. The SBTi will require for companies' scope 1&2 targets to align with 1.5°C using the Absolute Contraction approach or applicable SDA pathways. The most significant changes in the v5.0 criteria update further entail that the target year time-frame has been reduced from 5-15 years to 5-10 years and that the SBTi will not accept the submission of well below 2°C targets after the new criteria come into effect on 15. July 2022.⁴⁵

Validation of science-based (near-term) targets

Through the Science Based Targets Initiative and its online platform⁴⁶ companies can publically commit themselves to set a science-based target using the Standard Commitment Letter.⁴⁷ This target can be composed of several sub-targets, for example, for different scopes or varying timeframes. After committing to setting a SBT, companies have 24 months to develop their target using the methods described above, submit the target to the SBTi for the validation service and get it published. To increase transparency, enhance credibility and ensure consistency of the target validation process, the SBTi outlines the steps and procedures they follow for the validation of science-based targets in the “Target Validation Protocol for Near-term Targets”.⁴⁸ There is a streamlined process for Small or Medium-sized Enterprises (SME), which the SBTi defines “a non-subsidiary, independent company or public sector institution that employs fewer than 500 employees”.⁴⁹ The costs for the target validation service are USD \$9,500 (+ applicable VAT) or USD \$1,000 (+ applicable VAT) for SMEs and may be waived for “companies headquartered in developing countries or economies in transition”.⁵⁰ Further information can be found in the SBTi FAQs.⁵¹

Official criteria for approval of science-based (near-term) targets

The SBTi specifies 27 criteria (version 5.0)⁵² that all must be met for a company's climate target to be recognised by the initiative as “science-based”. In addition, the criteria can also be used by companies for orientation towards current best practice in the development of corporate climate action strategies.

45 Science Based Targets Initiative (2021). SBTi Criteria v5.0. www.bit.ly/SBTi-criteria

46 Science Based Targets Initiative Website. www.bit.ly/ScienceBasedTargets

47 Science Based Targets (2020) – SBTi Standard Commitment Letter. www.bit.ly/SBTi-commitment-letter

48 Science Based Targets (2021) – SBTi Target Validation Protocol. www.bit.ly/SBTi-target-validation

49 Science Based Targets (2021) – SBTi Corporate Manual, p. 9. www.bit.ly/sbti-corporate-manual

50 Science Based Targets (2021) – SBTi Corporate Manual, p. 8. www.bit.ly/sbti-corporate-manual

51 Science Based Targets Initiative (2022): Frequently Asked Questions. www.bit.ly/SBT_FAQ

52 Science Based Targets Initiative (2021). SBTi Criteria v5.0. www.bit.ly/SBTi-criteria

The criteria cover (operational) system boundaries, time-frames, levels of ambition, requirements for addressing scope 2 and scope 3 emissions, sector-specific guidelines, and reporting and recalculation of targets. In addition, the SBTi makes 13 recommendations. The 27 criteria (C1-27) and selected recommendations ("R") of the SBTi are presented in table 5. As a baseline for setting science-based targets, the SBTi requires companies to calculate and account for their emissions in accordance with the GHG Protocol Corporate

Standard⁵³, the Scope 2 Guidance⁵⁴ and the Corporate Value Chain (scope 3) Accounting and Reporting Standard.⁵⁵

53 World Resources Institute & World Business Council for Sustainable Development (2011). The Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard (Revised Edition). www.bit.ly/ghgp-AcRepStd

54 World Resources Institute (2015). Greenhouse Gas Protocol Scope 2 Guidance. www.bit.ly/Scope2-Guidance

55 World Resources Institute (2013). Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard. www.bit.ly/ghgp-Scope3AcRepStd

I. GHG Emissions Inventory and Target Boundary	
C1 – Organizational Boundary	<p>It is recommended that companies submit targets only at the parent- or group-level, not at the subsidiary level. Parent companies must include the emissions of all subsidiaries in their target submission, in accordance with boundary criteria above. In cases where both parent companies and subsidiaries submit targets, the parent company's target must also include the emissions of the subsidiary if it falls within the parent company's emissions boundary given the chosen inventory consolidation approach.</p> <p>Recommendations and additional guidance R – Setting organizational boundaries: The SBTi recommends that a company's organizational boundary, as defined by the GHG Protocol Corporate Standard, is consistent with the organizational boundary used in the company's financial accounting and reporting procedures.</p>
C2 – Greenhouse gases	The targets must cover all relevant GHGs as required per the GHG Protocol Corporate Standard.
C3 – Scope 1 and scope 2	The targets must cover company-wide scope 1 and scope 2 emissions, as defined by the GHG Protocol Corporate Standard.
*C4 – Requirement to have a scope 3 target	If a company's relevant scope 3 emissions are 40% or more of total scope 1, 2, and 3 emissions, a scope 3 target is required. All companies involved in the sale or distribution of natural gas and/or other fossil fuels shall set scope 3 targets for the use of sold products, irrespective of the share of these emissions compared to the total scope 1, 2, and 3 emissions of the company.
C5 – Scope 1 and 2 significance threshold	Companies may exclude up to 5% of scope 1 and scope 2 emissions combined in the boundary of the inventory and target.
C6 – Scope 3 emissions coverage for near-term targets	Companies must set one or more emission reduction targets and/or supplier or customer engagement targets that collectively cover(s) at least two-thirds (67%) of total scope 3 emissions considering the minimum boundary of each scope 3 category in conformance with the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.
II. Method validity	
C7 – 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 validation within 6 months of the publication of the revised method of the publication of relevant sector-specific tools.
III. Emissions accounting requirements	
C8 – Scope 2 accounting approach	Companies shall disclose whether they are using a location- or market-based accounting approach as per the GHG Protocol Scope 2 Guidance to calculate base year emissions and to track performance against a science-based target. GHG Protocol requires measuring and reporting scope 2 emissions using both approaches. However, a single and consistent approach shall be used for setting and tracking progress toward a SBT (e.g., using location-based approach for both target setting and progress tracking).

<p>*C9 – Scope 3 screening</p>	<p>Companies must complete a scope 3 inventory covering gross scope 3 emissions for all its emissions sources as set out as the minimum boundary of each scope 3 category per the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.</p>
<p>*C10 – Bioenergy accounting</p>	<p>CO₂ emissions from the combustion, processing and distribution phase of bioenergy and the land use emissions and removals associated with bioenergy feedstocks, shall be reported alongside a company's GHG inventory. Furthermore, CO₂ emissions from the combustion, processing and distribution phase of bioenergy and the land use emissions and removals associated with bioenergy feedstocks shall be included in the target boundary when setting a science-based target (in scopes 1, 2, and/or 3, as relevant) and when reporting progress against that target. [...]</p>
<p>C11 – Carbon Credits</p>	<p>The use of carbon credits must not be counted as emission reductions toward the progress of companies' near-term science-based targets. Carbon credits may only be considered to be an option for neutralizing residual emissions (see Net-Zero Criteria C28) or to finance additional climate mitigation beyond their science-based emission reduction targets (see Net-Zero Recommendation R10).⁵⁶</p>
<p>C12 – Avoided Emissions</p>	<p>Avoided emissions fall under a separate accounting system from corporate inventories and do not count toward science-based targets.</p>
<p>IV. Target Formulation</p>	
<p>*C13 – Base and target years</p>	<p>Targets must cover a minimum of 5 years and a maximum of 10 years from the date the target is submitted to the SBTi for validation. The choice of base year must be no earlier than 2015.</p>
<p>C14 – Progress to date</p>	<p>The minimum forward-looking ambition of targets is consistent with reaching net-zero by 2050, assuming a linear absolute reduction, linear intensity reduction, or intensity convergence between the most recent year and 2050 (not increasing absolute emissions or intensity).</p> <p>Recommendations and additional guidance:</p> <p>R – Long-term target year Targets that cover more than 10 years from the date of submission are considered long-term targets. Companies are encouraged to develop such long-term targets up to 2050 in addition to near-term targets required by C13 (see Net-Zero C17). At a minimum, long-term targets must be consistent with the level of decarbonization required to keep global temperature increase to 1.5°C compared to pre-industrial temperatures to be validated and recognized by the SBTi.</p> <p>R – Consistency It is recommended that companies use the same base years for all near-term targets.</p>
<p>V. Ambition</p>	
<p>C15 – Level of ambition for scope 1 and 2 targets</p>	<p>At a minimum, scope 1 and scope 2 targets must be consistent with the level of decarbonization required to keep global temperature increase to 1.5°C compared to pre-industrial temperatures.</p>
<p>C16 – Absolute targets</p>	<p>Absolute reductions must be at least as ambitious as the minimum of the approved range of emissions scenarios consistent with the 1.5°C goal.</p>
<p>C17 – Intensity targets</p>	<p>Intensity targets for scope 1 and scope 2 emissions are only eligible when they are modelled using an approved 1.5°C sector pathway applicable to companies' business activities.</p> <p>Recommendations and additional guidance:</p> <p>R – Choosing an approach The SBTi recommends using the most ambitious decarbonization scenarios that lead to the earliest reductions and the least cumulative emissions.</p>
<p>*C18 – Level of ambition for scope 3 emissions reduction targets</p>	<p>At a minimum, near-term scope 3 targets (covering the entire value chain or individual scope 3 categories) must be aligned with methods consistent with the level of decarbonization required to keep global temperature increase well-below 2°C compared to pre-industrial temperatures.</p>
<p>C19 – Supplier or customer engagement targets</p>	<p>Near-term targets to drive the adoption of science-based emission reduction targets by their suppliers and/or customers are in conformance with SBTi criteria when the following conditions are met:</p> <ul style="list-style-type: none"> • Boundary: Companies may set engagement targets around relevant and credible upstream or downstream categories. • Formulation: Companies shall provide information in the target language on what percentage of emissions from relevant upstream and/or downstream categories is covered by the engagement target or, if that information is not available, what percentage of annual procurement spend is covered by the target. • Timeframe: Companies' engagement targets must be fulfilled within a maximum of 5 years from the date the company's target is submitted to the SBTi for an official validation. • Level of ambition: The company's suppliers/customers shall have science-based emission reduction targets in line with SBTi resources.
<p>*C20 – Combined scope targets</p>	<p>Targets that combine scopes (e.g. 1+2 or 1+2+3) are permitted. When submitting combined targets, the scope 1+2 portion must be in line with at least a 1.5°C scenario and the scope 3 portion of the target must be in line with at least a well-below 2°C scenario. For sectors where minimum target ambition is further specified for companies' scope 3 activities, C24 supersedes C20.</p>

56 See Science Based Targets (2021) –SBTi Corporate Net-Zero Standard, p. 45: www.bit.ly/SBTi-NetZeroStandard

C21 – Renewable electricity

Targets to actively source renewable electricity at a rate that is consistent with 1.5°C scenarios are an acceptable alternative to scope 2 emission reduction targets. The SBTi has identified 80% renewable electricity procurement by 2025 and 100% by 2030 as thresholds (portion of renewable electricity over total electricity use) for this approach in line with the recommendations of RE100. Companies that already source electricity at or above these thresholds shall maintain or increase their use of renewable electricity to qualify.

Recommendations and additional guidance:

R – Purchased heat and steam: For science-based target modelling purposes using the SDA, it is recommended that companies model purchased heat and steam related emissions as if they were part of their direct (i.e. scope 1) emissions.

C22 – Fossil fuel sales or distribution

All companies involved in the sale or distribution of natural gas and/or other fossil fuels products shall set near-term and long-term scope 3 targets that are at a minimum consistent with the level of decarbonization required to keep global temperature increase to 1.5°C, irrespective of the share of these emissions compared to the total scope 1, 2, and 3 emissions of the company. Customer engagement targets as described in C19 are not eligible for this criterion. More guidance is detailed in C23 on the 50% revenue threshold for companies with fossil fuel activities.

C23 – Companies in the fossil fuel production business or with significant revenue from fossil fuel business lines

Companies involved in exploration, extraction, mining and/or production of oil, natural gas, coal as well as other fossil fuels cannot get their targets validated at this stage, irrespective of percentage revenue generated by these activities. Companies that derive 50% or more of their revenue from fossil fuels cannot have their targets validated at this time, and must follow the respective sector methodology once published.

VI. Sector specific guidance**C24 – Requirements from sector-specific guidance**

Companies must follow requirements for target setting and minimum ambition levels as indicated in relevant sector-specific methods and guidance at the latest, 6 months after the sector guidance publication. A list of the sector-specific guidance and requirements is available below, in the Target Validation Protocol, and the Corporate Manual.

VII. Reporting and recalculation**C25 – Frequency**

The company shall publicly report its company-wide GHG emissions inventory and progress against published targets on an annual basis.

C26 – Mandatory target recalculation

To ensure consistency with the most recent climate science and best practices, targets must be reviewed, and if necessary, recalculated and revalidated, at a minimum every 5 years. For companies with targets approved in 2020 or earlier, the latest year targets must be revalidated in 2025. Companies with an approved target that requires recalculation must follow the most recent applicable criteria at the time of resubmission.

C27 – Target Validity

Companies with approved targets must announce their target publicly on the SBTi website within 6 months of the approval date. Targets unannounced after 6 months must go through the approval process again, unless a different publication time frame has been agreed in writing with the SBTi.

Recommendations and additional guidance:**R – Where to disclose**

There are no specific requirements regarding where the inventory and progress against published targets should be disclosed, as long as it is publicly available. The SBTi recommends disclosure through standardized, comparable data platforms such as CDP's climate change annual questionnaire, though annual reports, sustainability reports and the company's website are acceptable.

R – Triggered target recalculation

Targets should be recalculated, as needed, to reflect significant changes that could compromise relevance and consistency of the existing target. The following changes should trigger a target recalculation:

- Scope 3 emissions become 40% or more of aggregated scope 1, 2 and 3 emissions;
- Emissions of exclusions in the inventory or target boundary change significantly;
- Significant changes in company structure and activities (e.g. acquisitions, divestitures, mergers, insourcing or outsourcing, shifts in goods or service offerings);
- Significant adjustments to the base year inventory or changes in data to set targets such as growth projections (e.g. discovery of significant errors or a number of cumulative errors that are collectively significant);
- Other significant changes to projections/assumptions used in setting the science-based targets.

R – Validity of target projections

Die SBTi empfiehlt Unternehmen, die Gültigkeit der zielbezogenen Projektionen jährlich zu überprüfen. Das Unternehmen sollte die SBTi über alle wesentlichen Änderungen informieren und diese wesentlichen Änderungen gegebenenfalls öffentlich berichten.

Table 6: Criteria for approval of science-based targets by the SBTi

The criteria marked with an asterisk (*) have refinements and additions to the previous version of the criteria

3.4. Development of an SBTi-approved target for corporate scope 3 emissions

In most sectors, the largest share of total emissions is found in the upstream and downstream value chain emissions (scope 3). This stresses that companies who aspire to be climate leaders and make a valuable contribution to limiting global warming (as much as possible) must address their emissions hotspots along the entire value chain.⁵⁷ In practice, companies face particular challenges in setting scope 3 targets when it comes to GHG accounting, developing actionable projects and measuring emission reductions along the value chain. The UN Global Compact Network, WWF and other organisations have recognized these challenges and are working with companies to find targeted solutions.

Foundations of scope 3 near-term targets

With the further development of its methodologies and criteria, the SBTi has significantly concretized the requirements for corporate scope 3 emissions reduction targets. The GHG Protocol Corporate Value Chain (scope 3) Accounting and Reporting Standard⁵⁸ defines 15 distinct categories that cover upstream and downstream emissions sources and the SBTi requires that companies must complete a scope 3 inventory screening for all relevant categories (Criterion C9). If scope 3 emissions are greater than 40% of total scope 1, 2 and 3 emissions (Criterion C4), companies are required to develop an ambitious target which collectively cover two-thirds (67%) of total scope 3 emissions (Criterion C6). Further, companies that are involved in the sale or distribution of natural gas and/or other fossil fuels have to set a near-term scope 3 target aligned with 1.5°C irrespective of the share of related emissions compared to total scope 1, 2 and 3 emissions (Criterion C22). When looking across sectors, category 1 (purchased goods and services) and category 11 (use of sold products) represent the majority of scope 3 emissions and therefore these categories should likely be included in a companies' target. For different sectors, the relative importance (in terms of emissions magnitude) of scope 3 categories may vary and some examples for important categories in specific sectors is given in the following:⁵⁹

- ▶ Automotive: Use of sold products (category 11).
- ▶ Chemicals: End of life treatment of sold products (category 12).
- ▶ Consumer Packaged Goods: Purchased goods and services (category 1).
- ▶ Electronics: Use of sold products (category 11).

- ▶ Food Processing: Purchased goods and services (category 1).
- ▶ Gas Distribution and Retail: Use of sold products (category 11).
- ▶ Logistics: Upstream transportation and distribution (category 4).

A helpful approach can be to initially carry out a high-level screening and identify which scope 3 categories should be included in the target boundary to adhere to the two-thirds threshold and spot where more accurate data is required. The Scope 3 Evaluator Tool⁶⁰ can support an initial, pragmatic estimation of scope 3 emissions. The tool relies on estimations based on the purchases or expenditures for several of the scope 3 categories (e.g. purchasing of goods and capital goods, waste disposal, logistics, business travel). After initial screening, primary data from suppliers or weight-based data from life cycle analysis databases can be used for the assessment of categories with material emissions. Companies should select high-quality primary data where available. Secondary data is acceptable, where a lack of primary data exists, nonetheless this limits a companies' ability to accurately track performance against their emission reduction target. Engaging in scope 3 emissions accounting – and iteratively improving data quality – lays the groundwork for companies to set scope 3 near-term targets and track and account for emission reductions along the value chain.

Available scope 3 target setting methods

After a scope 3 inventory has been conducted and the most relevant categories (i.e. with emissions hotspots) have been identified, the appropriate type of target and level of ambition has to be chosen. In principle, there are three types of scope 3 targets: absolute reduction targets, emission intensity targets and supplier/customer engagement targets. The excel-based SBTi Target Setting Tool can be used to support calculations for the first two target types of science-based scope 3 targets.⁶¹ In the v5.0 criteria update, the SBTi acknowledges the challenge of addressing scope 3 emissions and requires companies to set near-term scope 3 targets aligned to a global temperature increase of well-below 2°C (Criterion C18) from previously 2°C.

⁵⁷ Science Based Targets Initiative (2021). Corporate Manual. www.bit.ly/sbti-corporate-manual

⁵⁸ World Resources Institute (2013). Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard. www.bit.ly/ghgp-Scope3AcRepStd

⁵⁹ Science Based Targets Initiative (2021). Corporate Manual. www.bit.ly/sbti-corporate-manual

⁶⁰ Greenhouse Gas Protocol & Quantis (2019): Scope 3 Evaluator. www.bit.ly/Scope3Evaluator

⁶¹ Science Based Targets Initiative (2021). SBTi Target Setting Tool Version 2.0. www.bit.ly/target-setting-tool-2

Absolute Contraction or SDA targets

Similar to scope 1 & 2 emissions (Chapter 3.1), companies may also set targets for one or more categories of their scope 3 emissions with the Absolute Contraction or Sectoral Decarbonisation Approach (SDA). These approaches have a high level of confidence for climate protection and are easy to communicate. To set a scope 3 target with the Absolute Contraction approach, the SBTi requires a minimum ambition level of well-below 2°C which corresponds to an annual linear reduction rate of 2.5% per year compared to the base year.⁶²

JENS PLAMBECK, GLOBAL LEAD PRO ENVIRONMENT & CO₂ SCOPE 3, BAYER AG

We've set science-based targets: we'll reduce scope 1 and 2 emissions by 42% by 2030 - which is in line with 1.5°C of the Paris Agreement. Likewise, we'll reduce our main scope 3 emissions by 12.3%. Overall, switching fully to renewable energy is key. Addressing scope 3 - the biggest share of our footprint - is a challenge: data availability and quality is poor and comparability often weak. Plus, it takes time to engage with suppliers on this issue. To overcome these challenges and create impact at a larger scale, we became a member of CDP supply chain and we collaborate with initiatives such as Together for Sustainability (TfS) and the Pharmaceutical Supply Chain Initiative (PSCI).

With the SDA, a scope 3 target can be set by aligning company emissions to available well-below 2°C sector pathways. The requirements are slightly less stringent than those for scope 1 & 2 (for which alignment to 1.5°C pathways are the minimum level of ambition), as the SBTi acknowledges that scope 3 emissions need to be addressed in shared responsibility with other actors along the value chain and therefore can often not be directly influenced by the reporting company to the same extent as scope 1 & 2 emissions. Nevertheless, the SBTi encourages companies to pursue higher levels of ambition for their scope 3 targets in alignment with 1.5°C trajectories.⁶³

Physical intensity targets

Under the SBTi criterion C18 intensity targets related to physical activity indicators are also admissible, if the physical activity unit (e.g. squaremeter, tonne of product sold, etc.) is clearly defined and representative of a companies' scope 3 emissions included in the target boundary. Physical intensity targets are eligible when aligned to applicable SDA pathways or a year-on-year reduction of 7% (compounded) per physical activity unit. For example, the SDA applies to Scope 3 Category 1 "Purchased Goods and Services" if sectors covered by the SDA (e.g. aluminum and steel) account for a large proportion of purchasing. For the calculation targets related to external transport services (people or goods) and the use phase of sold cars and commercial vehicles, the SBTi Transport Tool⁶⁴ can be used.

Economic intensity targets

Economic intensity targets represent another eligible scope 3 target setting method with the SBTi and formulate intensity reductions in tCO₂e/\$ value added. These targets are based on the contraction allocation approach and assume a reduction in the global emission intensity per unit of value added. Under the "Greenhouse Gas Emissions per Unit of Value Added" (GEVA) method, the SBTi requires a minimum reduction in economic emissions intensity of 7% year-on-year (compounded). Value added can be calculated by using one of the following formulas:⁶⁵

- ▶ Value added = sales revenue – cost of goods and services purchased from external suppliers
- ▶ Value added = gross profit (often available in annual financial statements)
- ▶ Value added = operating profit = earnings before interest, tax and depreciation (EBITDA) + all personnel costs

It is important to consider that the GEVA method is based on idealised conditions and assumes that all companies are growing at the same rate equal to that of global GDP, and that GDP growth is precisely known. Given the volatility of economic metrics, the GEVA method is regarded as being less robust than the absolute contraction, SDA or physical intensity target setting methods. The economic intensity method may only be applied for the development of scope 3 targets and if companies wish to apply the GEVA method to develop scope 1 and 2 targets, they must also apply the absolute contraction method.

⁶² Science Based Targets Initiative. Target Validation Protocol. www.bit.ly/SBTi-target-validation

⁶³ Science Based Targets Initiative (2021). Corporate Manual. www.bit.ly/sbti-corporate-manual

⁶⁴ Science Based Targets Initiative (2018). SDA Transport Tool v1.1. www.bit.ly/sda-transport

⁶⁵ Science Based Targets Initiative (2021). Corporate Manual, p. 25. www.bit.ly/sbti-corporate-manual

Supplier or customer engagement targets

If a company still has to identify levers for more specific action to reduce scope 3 emissions or does not exert a lot influence on value chain partners, an option offered by the SBTi is to a set supplier or customer engagement near-term target.⁶⁶ Engagement targets are aimed at driving the adoption of science-based targets amongst suppliers and/or customers and are admissible when adhering to SBTi specifications for boundary, formulation, timeframe and level of ambition as outlined in Criterion C19 and Companies can set scope 3 engagement targets for any relevant upstream (cat. 1 – 8) or downstream (cat. 9 – 15) and identifying suppliers and customers where engagement could lead to emission reductions. This selection of partners can either be based on expenditures or on emission impact and alternatively, a company can also focus on "critical suppliers" or "strategic suppliers". For instance, engaging a supplier to drive emission reductions may also benefit other companies purchasing from the same supplier. Here, it is important to note that the supplier with most spendings may not be the largest in terms of emissions magnitude and companies are required to ensure that the two-thirds (67%) threshold for scope 3 targets is fulfilled (Criterion C6).⁶⁷

The SBTi aims for supplier or customer engagement targets to lead to near-term emission reductions. Therefore, to fulfill such a scope 3 target, the suppliers and/or customers included in the target boundary must have set science-based targets for their scope 1 and scope 2 emissions within 5 years of target submission. Over time the suppliers and/or customers should set a target for scope 3 emissions as well, if these represent more than 40% of total company emissions (Criterion C4). A more in-depth explanation is available in the SBTi Target Validation Protocol.⁶⁸

Selection of a single or multiple targets

Companies can decide to either set a single target (combined) that includes all relevant scope 3 categories, or set multiple targets (category-specific). In general, combined targets will be easier to communicate, however may provide less transparency into each scope 3 category. On the flipside, separate targets allow for more customisation and transparency, though may be more difficult to communicate. For a comparison of the different scope 3 target types, please refer to the SBTi Corporate Manual.⁶⁹ It is also possible to submit a combined scope 1, 2 and 3 target, in which case the scope 1 and 2 portion has to adhere to criteria C14 and C15, and the scope

3 portion to criterion C18.⁷⁰ Ultimately, the selection of the most suitable target type will depend on the specific circumstances of a company and may only become more apparent when going through the process of GHG emissions accounting and analysis of scope 3 emissions hotspots and reduction opportunities.

3.5. Near-term targets and their context within net-zero

What was earlier known as science-based targets, is now known as near-term targets with an acceptable timeframe of 5-10 years from the date of submission. Emission reduction targets that cover more than 10 years are considered to be long-term targets.⁷¹ The SBTi encourages companies to develop such long-term targets up to 2050 (in addition to near-term targets) which are at a minimum consistent with the level of decarbonization required to keep global temperature increase to 1.5°C compared to pre-industrial levels.

In response to changing landscape around climate change, companies have increasingly been adopting long-term targets, repeatedly referred to as "net-zero"-targets. However, not all net-zero targets are equal in terms of scope, boundary, and action plans to achieve these net-zero targets, and this can limit their collective impact.⁷² To address this gap, the SBTi has recently (October 2021) released the first ever **Net-Zero Standard**, with the purpose to provide business leaders with a robust and science-based framework to set long-term net-zero targets aligned with 1.5°C pathways and to raise ambition-levels in the corporate environment. The Net-Zero Standard was developed in a multi-stakeholder process, including two public consultations and a company road test. This new strategy is being rolled out by the SBTi in response to the increasing urgency for climate action and the success of science-based targets to date.⁷³

The existence of near- and long-term targets allows companies to plan across different time-scales. Hereby, near-term targets can serve as milestones towards achieving a long-term target, and are meant to help galvanize the action required to achieve the significant emissions reductions by 2030. The SBTi recommends to companies who aspire to set a net-zero target to adhere to the requirements of near-term targets and the GHG Protocol, which can provide confidence in emission reductions plans and ease the process of setting subsequent long-term/net-zero targets. Adhering to a common standard for net-zero emissions can also help compa-

66 Science Based Targets Initiative (2021). Corporate Manual. www.bit.ly/sbti-corporate-manual

67 Science Based Targets Initiative (2021). Corporate Manual, p. 26. www.bit.ly/sbti-corporate-manual

68 Science Based Targets Initiative (2021). Target Validation Protocol, p.22. www.bit.ly/SBTi-target-validation

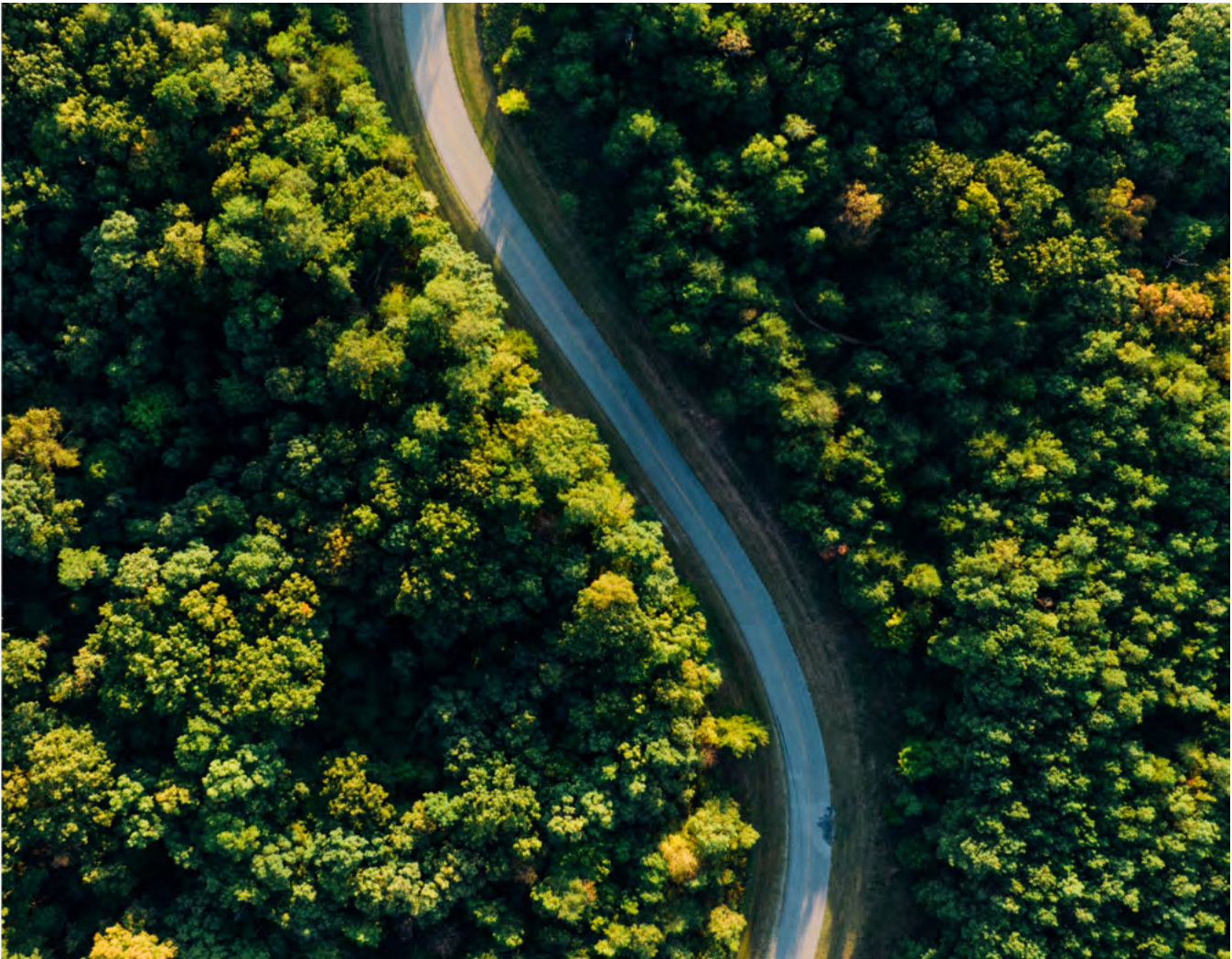
69 Science Based Targets Initiative (2021). Corporate Manual, p. 28ff. www.bit.ly/sbti-corporate-manual

70 Science Based Targets Initiative (2021). Target Validation Protocol, p. 23. www.bit.ly/SBTi-target-validation

71 Science Based Target Initiative (2021). Net-Zero Standard. www.bit.ly/SBTi-NetZeroStandard

72 Science Based Target Initiative (2021). Net-Zero Standard. www.bit.ly/SBTi-NetZeroStandard

73 Science Based Target Initiative (2021). Net-Zero Standard. www.bit.ly/SBTi-NetZeroStandard



nies to identify if they are investing in business models which are inconsistent with the goals of the Paris Agreement.⁷⁴ Worldwide, more than 1500 companies have committed to reach science-based net-zero before 2050 by signing up to the SBTi's Business Ambition for 1.5°C campaign (status as of June 2022).⁷⁵

Based on the foundational and coherent definition laid out in the Net-Zero Standard and the complementary guidance, criteria and recommendations, the SBTi hopes to inform the transformative mitigation efforts required in all sectors.⁷⁶ An extensive discussion of the SBTi definition of "net-zero" is beyond of the scope of this discussionpaper and for long-term/net-zero targets, a separate Discussion-paper could be (co-)developed.

⁷⁴ Science Based Target Initiative (2021). SBTi Corporate Net-Zero Standard. www.bit.ly/SBTi-NetZeroStandard

⁷⁵ Science Based Target Initiative (2022). Business Ambition for 1.5°C (visited 03 June 2022). www.bit.ly/SBTi-15ambition

⁷⁶ Science Based Target Initiative (2021). Net-Zero Standard, p. 17. www.bit.ly/SBTi-NetZeroStandard

4. EXAMPLES OF SCIENCE-BASED TARGETS FROM GERMAN COMPANIES

In Germany (and around the world), more and more companies are committing to reducing their GHG emissions in line with what climate science says is necessary to meet the goals of the Paris Agreement. When the previous version of this discussionpaper had been published in 2019, no German company had yet set an approved target in line with the 1.5°C limit – and this

was expected to change with the new SBTi requirements. Now – around three years later – the level of ambition for emission reduction targets has notably increased and the climate debate is much more present in the corporate environment. As of June 2022, there are a total of 58 German companies with 1.5°C targets and 56 companies with a commitment to Net-Zero in line with the SBTi.⁷⁷ Table 7 shows five recent examples of businesses from different sectors that have set science-based targets officially approved by the SBTi.

⁷⁷ Science Based Targets Initiative (2022). Companies taking action (visited 03. June 2022).
www.bit.ly/SBT-CompaniesTakingAction

Company 1.5 °C	Sector	Summary of target	Target Scope 1&2	Target Scope 3
BMW	Automobiles and Components	Near term: 1.5°C by 2030 Net-zero: committed Date published / updated: 2022	BMW Group commits to reduce scope 1 and 2 GHG emissions 80% per vehicle produced by 2030 from a 2019 base year (the target boundary includes biogenic emissions and removals from bioenergy feedstocks).	BMW Group commits to reduce scope 3 GHG emissions from use of sold products 50% per vehicle kilometer by 2030 from a 2019 base year. BMW Group commits to reduce scope 3 GHG emissions from purchased goods & services and upstream transportation & distribution services 22% per vehicle sold by 2030 from a 2019 base year.
Deutsche Telekom	Tele-communications	Near term: 1.5°C by 2030, 2021 Net-zero: committed Date published / updated: 2019	The German telecommunications company Deutsche Telekom AG commits to reduce absolute Scope 1&2 GHG emissions 90% by 2030 from a 2017 base-year. Deutsche Telekom AG commits to increase annual sourcing of renewable electricity from 41% in 2017 to 100% by 2021.	Deutsche Telekom AG commits to reduce Scope 3 GHG emissions 25% per customer by 2030 from a 2017 base-year.
Dürr AG	Construction and Engineering	Near term: 1.5°C by 2030 Net-zero: committed Date published / updated: 2022	The Dürr Group commits to reduce absolute scope 1 and 2 GHG emissions 70% by 2030 from 2019 base year.	The Dürr Group also commits to reduce absolute scope 3 GHG emissions 15% over the same timeframe.
MVV Energie AG	Electric Utilities and Independent Power Producers and Energy Traders (including fossil, alternative and nuclear energy)	Near term: 1.5°C by 2030 Net-zero: committed Date published / updated: 2021	Multinational German energy company MVV Energie AG commits to reduce scope 1 and 2 GHG emissions 83% per kWh by 2030 from a 2018 base year. (The target boundary includes biogenic emissions and removals from bioenergy feedstocks)	MVV Energie AG commits to reduce scope 1 and 3 GHG emissions from all sold electricity 83% per kWh by 2030 from a 2018 base year. (The target boundary includes biogenic emissions and removals from bioenergy feedstocks). MVV Energie AG also commits to reduce absolute scope 3 GHG emissions 83% by 2035 from a 2018 base year.
Siemens AG	Electrical Equipment and Machinery	Near term: 1.5°C by 2030 Net-zero: committed Date published / updated: 2021	Siemens AG commits to reduce absolute scope 1 and 2 GHG emissions 50% by 2030 from a 2019 base year.	Siemens AG also commits to reduce absolute scope 3 GHG emissions 15% by 2030 from a 2019 base year.

Table 7: Examples of science-based climate targets of German companies validated by SBTi⁷⁸

⁷⁸ Science Based Targets Initiative (2022). Companies taking action. www.bit.ly/SBT-CompaniesTakingAction

5. CONCLUSION AND OUTLOOK

The resources made available by the SBTi hint towards the unprecedented challenge that lies ahead - to halve global emissions by 2030 in order to keep the goal of limiting global warming to 1.5°C alive. More and more companies are making meaningful contributions towards this goal by setting science-based targets and working towards aligning with 1.5°C pathways. This can send a powerful message to their investors, clients and employees.

Meanwhile, other companies are at least starting to engage with the SBTi logic and methods and are trying to understand the implications of adopting science-based targets. Finding their way through all the available SBTi resources and adhering to the stringent target setting criteria remains a challenge for companies, and there is a need to break down the challenges in order to motivate the adoption of ambitious corporate climate action strategies.

To contribute to this end, this discussion paper focusses on helping companies understand the fundamentals of science-based targets and aims to provide an overview of available resources and ongoing developments.⁷⁹ In recent times, science-based targets are already developing as a standard business practice (reflected in the emergence of a growing number of companies with targets officially validated by the SBTi) and this offers an "unparalleled opportunity to drive corporate climate action".⁸⁰ To understand where a company stands in their climate action journey, it can be helpful to familiarize one-self with the 5-step call-to-action process outlined in the SBTi Corporate Manual.⁸¹

79 Science Based Target Initiative (2022). SBTi Climate Action in 2022. www.bit.ly/SBTi-climate-action

80 Science Based Target Initiative (2021). Net-Zero Standard, p. 4. www.bit.ly/SBTi-NetZeroStandard

81 Science Based Target Initiative (2021). Corporate Manual. www.bit.ly/sbti-corporate-manual





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