# Science-based Target Setting Manual

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# A product of the Science Based Targets initiative



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# Contents

# Foreword

To be written once pub has gone through internal review.

# Executive Summary

## Key Findings

- Companies can play their part in combatting climate change by setting greenhouse gas (GHG) emissions reduction targets that are aligned with the reduction pathways for limiting global temperature rise to within 2°C. These targets are termed science based targets (SBTs).
- SBTs offer a plethora of advantages over more incremental GHG reduction targets and boost companies' competitive advantage in the transition to the low-carbon economy.
- Multiple SBT-setting methods exist and vary in terms of the ambition of the targets they output.
- To ensure their rigor and credibility, SBTs should meet a range of criteria related to target duration, ambition, and coverage of internal and value chain sources.
- Getting internal stakeholders on board through all stages of the target-setting process requires careful planning.
- Once an SBT has been set, communicating it fully, simply, and clearly is important to accurately inform stakeholders and build credibility.

## Context

**In the Paris Agreement national governments committed to limit temperature rise to well below 2 degrees Celsius (°C) and pursue efforts to limit temperature rise to 1.5°C.** Beyond these thresholds, the world will increasingly experience dangerously elevated amounts of sea-level rise, droughts, flooding, and other extremes.

**Despite the efforts of governments and other actors, total anthropogenic GHG emissions continue to increase.** Under current trajectories, global mean temperatures are projected to increase by 3.7 to 4.8°C by the end of this century. Even under existing country-level commitments, emissions levels in 2030 will be 24 to 60 percent higher than they should be under least-cost 2°C scenarios (UNFCCC Secretariat 2016).

**Companies have a pivotal role in ensuring that the global temperature goals are met, but most existing company targets are not ambitious enough.** The majority of global GHG emissions are either directly or indirectly influenced by the corporate sector. Many companies, recognizing the risk climate change poses to their business and the opportunity it creates for leadership and innovation, have already committed to change by setting emission reduction targets. Yet, to date, most companies' targets have been incremental and do not match the ambition and timelines consistent with a 2°C future.

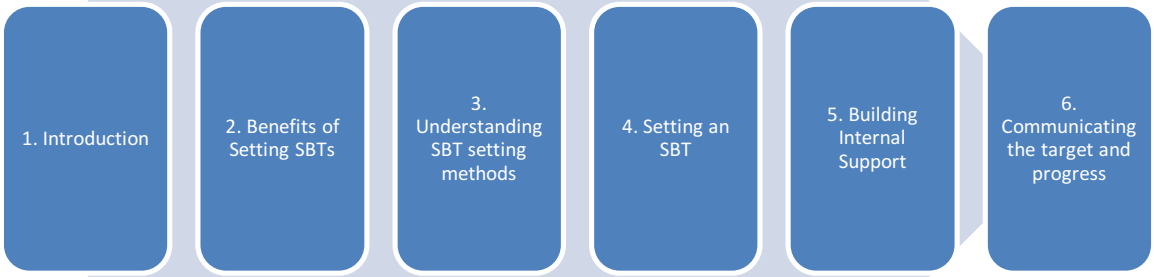
**SBTs represent a more robust approach for companies to manage their emissions over the long haul.** SBTs are grounded on an objective, scientific evaluation of what is needed, rather than what is achievable by any one company. And they offer a firm foundation for companies' long-term climate change strategies, boosting companies' competitive advantage in the transition to the low-carbon economy. Targets are considered "science-based" if they are in line with the level of decarbonization required to keep global temperature increase below 2°C compared to pre- industrial temperatures.

**Companies are increasingly adopting SBTs, although uncertainty exists regarding best practices.** Over 40 companies have already set an SBT and over two hundred more have committed to set an SBT in the near future through the Science Based Targets initiative (see below). Because setting SBTs is an emerging practice, considerable uncertainty exists amongst companies around the benefits of settings SBTs, what kind of target may constitute an SBT, and best practices for both gaining internal company support for SBT adoption and communicating SBTs to external audiences. This uncertainty presents a barrier to further adoption of SBTs.

## About This Report

**This manual provides step-wise guidance and recommendations on setting SBTs.** It covers the main phases in setting an SBT, from understanding the business benefits of setting SBTs to communicating progress against established SBTs (Figure ES-1).

**Figure ES-1:** Chapters in the Manual




*Note*: Technical annexes provide supplementary information to Chapter 3 on how SBT-setting methods work and on the specific SBT methods available.

**This manual is a product of the Science Based Targets initiative, which identifies and promotes innovative approaches to setting ambitious and meaningful corporate GHG reduction targets.** The content of this manual was developed based on interviews with more than 20 companies with experience in setting SBTs. It also draws upon recommendations and criteria developed by the SBT initiative for the review of proposed SBTs submitted to the initiative as part of its Call to Action campaign (see Box ES-1). A technical advisory group comprising experts from industry and NGOs provided detailed input on multiple drafts of the manual.

**Companies are the primary intended audience, although the manual may be useful for other stakeholders interested in SBTs.** Companies (and any supporting consultants) should consult this manual when considering or developing a new GHG emissions reduction target. Companies may also use this manual to establish whether existing targets are aligned with science. Above all, companies

should use this manual (and SBTs more specifically) as a framework for their overarching GHG management strategy. Other stakeholders, including investors, environmental groups, policy makers, and academics, can use this manual to learn about best practices for setting SBTs.

**This manual represents a snapshot of existing best practices in setting SBTs.** Over time, the expectation of what constitutes an SBT may change to reflect advances in economic modelling, climate science, and global emissions reduction efforts, and to reflect further lessons learned from setting SBTs. Also, new data resources and tools may become available in the future that support setting SBTs based on sectoral or geographic considerations that currently can't be supported using existing data. While the manual necessarily concentrates on currently available tools, it outlines general recommendations that should guide future target setting practices even as the underlying science evolves.

**This manual does not provide guidance on implementing GHG reduction measures.** Companies can use a variety of measures to reduce GHG emissions, including increasing energy efficiency and decarbonizing energy sources. Successful strategies for achieving SBTs will most likely include a mix of measures depending on a company's goals, starting position, the cost of various alternatives, and external market conditions. Deciding upon which strategy is most appropriate for any one company is beyond the scope of this manual.

**Box ES-1. About the Science Based Targets initiative**

**The SBT initiative champions SBT setting as a powerful way of future-proofing companies' growth in the transition to the low-carbon economy.**

It is a collaboration between CDP, World Resources Institute (WRI), the World Wide Fund for Nature (WWF), and the United Nations Global Compact (UNGC).

The initiative:

- Showcases companies that have set SBTs through case studies, events and media to highlight the increased innovation, reduced regulatory uncertainty, strengthened investor confidence and improved profitability and competitiveness generated by setting SBTs.
- Defines and promotes best practice in setting SBTs with the support of a Technical Advisory Group.
- Offers resources, workshops and guidance to reduce barriers to adoption.
- Independently assesses and approves companies' targets through a Call to Action campaign that calls on companies to demonstrate their leadership on climate action by publicly committing to set SBTs. Companies then have two years to submit a target to the initiative, which showcases the target after having confirmed it meets specific criteria.

The initiative's overall aim is that by 2020, science-based target setting will become standard business practice and companies will play a major role in driving down global GHG emissions. Embedding SBTs as a fundamental component of sustainability management practices is crucial in achieving this.

For more information, see http://sciencebasedtargets.org/

## Key issues in Setting SBTs

**Companies have sought guidance on a range of issues connected to setting SBTs. Some of the most pressing include:**

**What are the business benefits of setting an SBT?** Arbitrary targets or incremental targets based on what is confidently achievable may result in some business advantages, such as reduced costs. SBTs can require greater internal investment and companies are often uncertain about whether and how SBTs can allow them to further capitalize on these benefits.

**What methods exist for setting SBTs?** Multiple methods exist, differing in terms of whether they calculate targets as a percentage reduction in absolute emissions, emissions intensity per unit economic output, or emissions intensity per amount of physical product. The methods also vary in sectoral specificity and may be based on different scientific datasets and emissions projections. Different methods may therefore yield targets that require substantially different action from companies and it can be unclear which methods are preferred under which circumstances.

**What does a credible SBT look like?** Key considerations include: What time period should an SBT cover to not only facilitate investment in low-carbon technologies that are transformative over the long-term, but also drive emissions reductions over the near-term? What percentage of the emissions from internal operations ("scope 1 and 2 emissions") and value chains ("scope 3 emissions") should an SBT cover? When are value chain targets important? And how may renewable energy purchases and offsets be used toward an SBT, if at all?

**What are effective communication strategies for gaining internal buy-in and building credibility?** The effective communication of an SBT guides internal management decisions, increases buy-in from employees, and enhances corporate reputation. Because SBTs usually entail greater commitment on the part of companies to alter their business practices, getting the communication right matters.

## Conclusions and recommendations

**SBTs offer many advantages over more incremental GHG reduction targets.** SBTs are more effective in:

- Building business resilience and increasing competitiveness.
- Driving innovation and transforming business practices.
- Building credibility and reputation.
- Influencing and preparing for shifts in public policy.

**SBT-setting methods can be complex and certain methods are preferred over others.**

- Generally, all SBT-setting methods have three components: a carbon budget (defining the overall amount of GHGs that can be emitted to limit warming to within 2°C), an emissions scenario (defining the magnitude and timing of emissions reductions), and an allocation approach (defining how the budget is allocated to companies).
- Six methods are currently available that each have applicability to multiple sectors.
- Companies should not to default to the "easiest" option, but should choose the method and target that best drives emissions reductions to demonstrate sector leadership.
- To calculate SBTs, companies should use a method that is based either on sector-specific decarbonization pathways (i.e., the "Sectoral Decarbonization Approach" method) or on a straightforward percentage reduction in absolute emissions.

- Economic intensity targets may be set. In general, however, an intensity target should only be set if it leads to absolute reductions in line with climate science or is modeled using a sector-specific decarbonization pathway that assures emission reductions for the sector as a whole.

**To ensure their rigor and credibility, SBTs should meet a range of criteria.** Most importantly:

- An SBT should cover a minimum of 5 years and a maximum of 15 years from the date the target is publicly announced. Companies are also encouraged to develop long-term targets (e.g., through 2050).
- The boundaries of a company's SBT should align with those of its GHG inventory.
- The emissions reductions from scope 1 and 2 sources should be aligned with 2°C decarbonization pathways.
- SBTs should cover at least 95% of company-wide scope 1 and 2 emissions.
- Companies should use a single, specified scope 2 accounting approach ("location-based" or "market-based") for setting and tracking progress toward an SBT.
- If a company has significant scope 3 emissions (over 40% of total scope 1, 2 and 3 emissions), it should set a scope 3 target.
- Scope 3 targets generally need not be science-based, but should be ambitious, measurable, and clearly demonstrate how a company is addressing the main sources of GHG emissions within its value chain in line with current best practices.
- The scope 3 target boundary should include the majority of value chain emissions; for example, the top three emissions source categories or two-thirds of total scope 3 emissions.
- The nature of a scope 3 target will vary depending on the emissions source category concerned and the influence a company has over its value chain partners, as well as the quality of data available from those partners.
- SBTs should be periodically updated to reflect significant changes that would otherwise compromise their relevance and consistency, over time.
- Offsets and avoided emissions should not count toward SBTs.

**Getting internal stakeholders on board through all stages of the target-setting process requires careful planning.**

- Staff responsible for setting an SBT should partner closely with all levels of the company during the target-setting process to socialize goals, assess feasibility, and co-create practical implementation plans.
- Staff should anticipate the issues that commonly create internal push-back and formulate ready-made responses.
- For scope 3 targets, companies should work closely with and support suppliers during the target-setting process to increase buy-in and enable implementation.

**Once a target has been set, communicating it fully, simply, and clearly is important to accurately inform stakeholders and build credibility.**

- Companies should follow the GHG Protocol accounting and reporting principles to disclose quantitative and qualitative aspects of their SBTs so that audiences can fully understand the SBTs' context, implications, and nuances.
- Companies should report annual progress in reaching their targets.
- SBTs should be communicated in understandable terms and in engaging ways, such as through diagrams and infographics, while avoiding jargon.

# Key Terms

| | |
|---|---|
| Absolute emission target | An overall reduction in the amount of GHGs a company emits into the atmosphere by a target year relative to levels in a base year. |
| Allocation approach | The way the carbon budget underlying a given emissions scenario is allocated among companies with the same level of disaggregation (e.g. in a region, in a sector, or globally). |
| Assessment report (AR) | Material published by the IPCC providing a full scientific and technical assessment of climate change. |
| Base year | The period in history against which a company tracks performance over time. |
| Carbon budget | The estimated amount of carbon (or $CO_2$) the world can emit before warming will exceed specific temperature thresholds. Commonly taken as 1000 $GTCO_2$ for a 2°C threshold. |
| $CO_2$ equivalent ($CO_2e$) | A unit used to express the global warming potential of different greenhouse gases as a single figure, namely the equivalent amount or concentration of carbon dioxide. |
| Emissions intensity target | A reduction in emissions relative to a specific business metric, such as production output or financial performance of the company (e.g., tonne CO2e per tonne product produced or value added). The target is achieved by a target year relative to levels in a base year. |
| Emissions scenario | A forecast of future emissions and atmospheric GHG concentrations, used to assess the impact of socioeconomic and technological changes on future emissions. |
| Energy Technology Perspectives (ETP) | Document published by the IEA that provides scenarios that set out pathways to a sustainable energy future in which technology choices are driven by costs and environmental factors. |
| Greenhouse gas (GHG) | A gas that absorbs and emits radiation in the atmosphere, contributing to the greenhouse effect. GHGs include (among others) water vapor, carbon dioxide, methane, nitrous oxide, ozone, and CFCs. |
| Heterogeneous sector | A sector that cannot be described using a single physical indicator because it produces a diverse array of products that each have unique characteristics and traits and are difficult to compare to one another. |
| Homogeneous sector | A sector in which companies make products that are uniform both within companies and across the sector as a whole, and that can be described using a single physical indicator. |
| Offset | Discrete GHG reductions used to compensate for GHG emissions elsewhere. |
| Representative concentration pathway (RCP) | A GHG concentration trajectory developed in the IPCC 5th Assessment Report (AR5) for climate modeling and research. |
| Scope 1 emissions | Emissions from sources that are owned or controlled by the reporting company. |
| Scope 2 emissions | Emissions from the generation of electricity, heat, or steam that has been purchased by the reporting company. |
| Scope 3 emissions | All other indirect emissions from sources that are located along the reporting company's value chain. |

| | |
|---|---|
| Target year | The year by which a company intends to meet the emissions reduction committed to in a target. |
| Two Degrees Scenario (2DS) | An emissions scenario developed in the IEA's ETP that describes an energy system consistent with an emissions trajectory that would give a 50 percent chance of limiting average global temperature increase to 2°C. |
| Value-added | Depending on accounting terminology, this is defined as gross profit, operating profit, revenue minus the cost of purchased goods and services, or EBITDA plus all personnel costs. |

# List of Abbreviations

| | |
|---|---|
| **AR5** | Fifth Assessment Report from the IPCC |
| **$CH_4$** | methane |
| **C-Fact** | Corporate Finance Approach to Climate-stabilizing Targets |
| **$CO_2$** | carbon dioxide |
| **$CO_2e$** | carbon dioxide-equivalent |
| **CSO** | Context-based Carbon Metric |
| **CSI** | Climate Stabilization Intensity Targets |
| **ETP** | Energy Technology Perspectives |
| **GDP** | gross domestic product |
| **GEVA** | Greenhouse gas Emissions per Value Added |
| **GHG** | greenhouse gas |
| **IEA** | International Energy Agency |
| **IPCC** | Intergovernmental Panel on Climate Change |
| **kWh** | kilowatt hour |
| **RCP** | representative concentration pathway |
| **SBT** | science-based target |
| **SDA** | Sectoral Decarbonization Approach |
| **UNFCCC** | United Nations Framework Convention on Climate Change |

# 1. Introduction

**By How Much Must Global Emissions be Cut?**

The Fifth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC[i]) shows that despite efforts to mitigate climate change, greenhouse gas (GHG) emissions levels have increased by 31% between 1990 and 2010 (Blanco et al. 2014). The world is currently emitting approximately 50 $GtCO_2e$/year into the atmosphere (Blanco et al. 2014) and, as the population and the economy continue to grow, will emit 56.3 $GtCO_2e$/year by 2030, even with current government pledges (UNFCCC Secretariat 2016). Under this trajectory, global mean temperatures are projected to increase by 2.7 to 3.7°C by the end of this century (WRI 2015), with devastating impacts on natural systems, water resources, agricultural productivity, and ultimately on economic, political, and social stability.

The science says that global GHG emissions must be cut by between 49 and 72% from 2010 levels by 2050 (Clarke et al. 2014)[ii]. Otherwise, the global temperature increase will exceed 2ºC compared to pre-industrial temperatures and trigger catastrophic changes to the earth's climate. An increasing number of scientists have indicated that even a 2°C increase is too high to ensure climate stability and are calling for a limit of 1.5ºC (e.g., Schellnhuber et al. 2016). A 1.5ºC limit means fewer emissions are possible and that global energy and industry emissions must be phased out earlier (Table 1-1).

**Table 1-1.** Comparing Allowed Emissions Trajectories Between the 1.5ºC and 2ºC Limits

| | **1.5ºC limit** | **2ºC limit** |
|---|---|---|
| Amount of emissions possible (from year 2012) before temperature limit is hit | 400 GT $CO_2$ | 1010 GT $CO_2$ |
| Year by which global emissions must peak | Before 2020 | Before 2020 |
| Required reduction in global emissions by 2050, from 2010 levels | 70-95% | 49-72% |
| Year by which global energy and industry emissions must be phased out | Between 2045 and 2055 | Between 2060 and 2075 |

*Source*: Clarke et al. 2014.

Nearly 200 countries participated in the twenty first United Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties (COP 21) and signed onto the accompanying Paris Agreement to hold "the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C" (UNFCCC 2015). They committed to a variety of steps, including a significant reduction in GHG emissions. In spite of this ambition, a substantial shortfall exists -- even the best efforts under existing commitments would lead to emissions levels in 2030 that are 24 to 60% higher than they should be under least-cost 2°C scenarios (UNFCCC Secretariat 2016). Business has a critical role to play in bridging this gap.

**What is a Science-Based Target?**

In this manual, GHG emissions reduction targets are considered "science-based" if they are in line with the level of decarbonization required to keep global temperature increase within 2°C of pre-industrial levels.

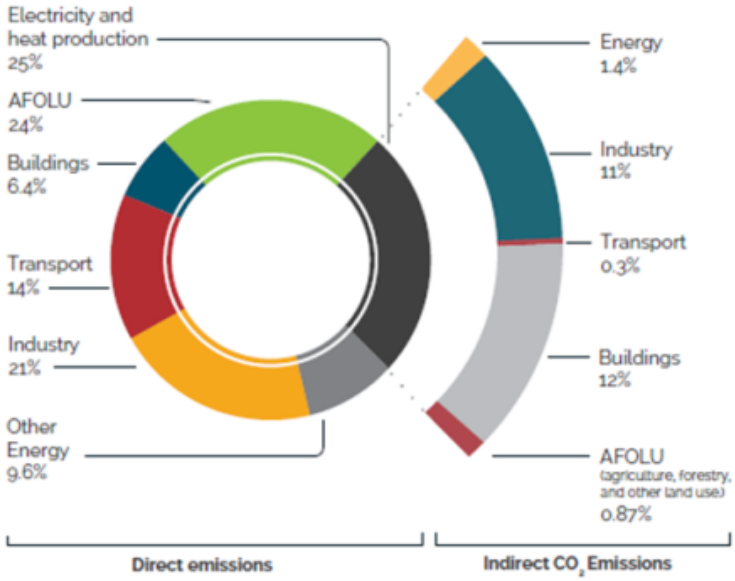
Over time, the expectation of what constitutes a science-based target (SBT) may change to reflect advances in economic modelling, climate science, and global emissions reduction efforts. In particular, targets may become science-based only if they are aligned with "well below 2°C" or 1.5 °C scenarios, in keeping with the Paris Agreement. While companies are encouraged to set SBTs aligned with "well below 2°C" or 1.5°C scenarios, doing so is not currently a core expectation and this manual focuses on methods for a 2°C increase[iii].

Once set, SBTs are not fixed, but rather should be adjusted over time to reflect changes in climate science and other factors (see Chapter 4.4).

**The Vital Role of Business**

Global emissions result from the activities of major economic sectors, including electricity and heat production; agriculture, forestry and other land use (AFOLU); commercial buildings; transport and industry (Figure 1.1).

**Figure 1.1.** Total Anthropogenic GHG Emissions ($GtCO_2e$ per year) by Economic Sector, 2010 Data



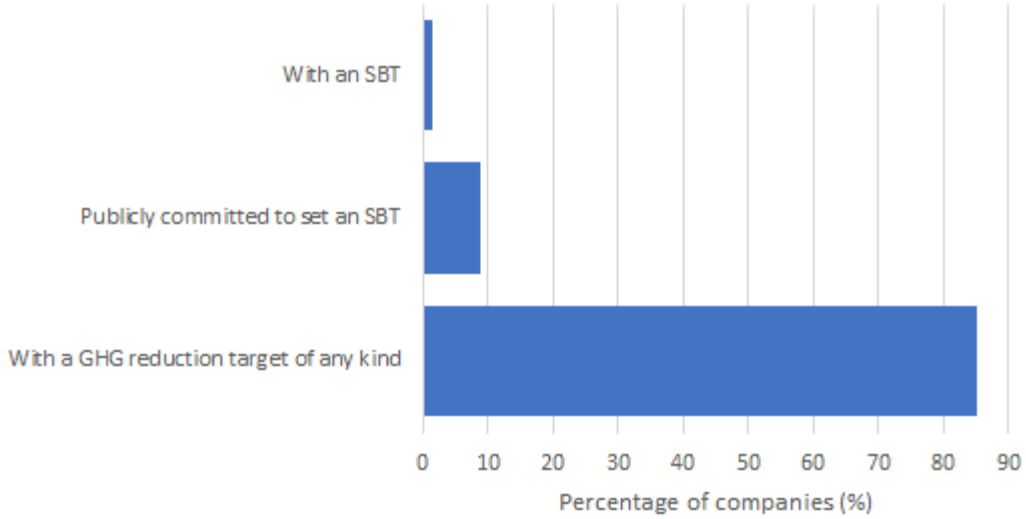

*Note*: Other Energy covers sources other than public electricity and heat production, such as fuel combustion in coke ovens and blast furnaces.

*Source*: Adapted from IPCC 2014a.

Companies operating within all these economic sectors have a vital role to play in facilitating the transition to a low-carbon future. Many companies, recognizing the risk climate change poses to their business and the opportunity it creates for leadership and innovation, have already committed to change by setting emission reductions targets, and tracking and publicly reporting GHG emissions. For example, out of a sample of 1089 companies that collectively account for 12% of global emissions, fully 85% of the companies had set a target (CDP 2016).

However, most of these targets do not equate to the reductions required to meet the threat posed by climate change: they are not as ambitious as the science indicates they need to be, don't cover a meaningful percentage of the companies' emissions, or lack a long-term perspective (i.e. go beyond 2020) (CDP 2015a; CDP 2016). For example, of the same 1089 companies, only 1% had set an SBT (Figure 1.2) and combined reductions from those targets only equal one quarter of the total reductions needed indicated by a 2°C pathway (CDP 2016).

**Figure 1.2:** Incremental Targets are Much More Common than SBTs Among a Set of 1089 Companies




*Source:* CDP (2016).

| **Business Opportunity in Filling Emissions Gap** |
|---|
| The Low Carbon Technology Partnerships Initiative (LCPTi)[iv] created low-carbon technology deployment action plans for nine business sectors. PwC estimated that if its ambitions were realized, the LCPTi could contribute 65 percent of the emission reductions necessary to keep the world within the 2°C scenario by 2030. PwC also estimated that the action plans could help "channel $5-10 trillion of investment toward low carbon sectors of the economy and support 20-45 million person-years of employment. (PWC 2015)" |

| **Decarbonization of the Power Sector** |
|---|

Electricity generation contributes approximately one third of global GHG emissions (Figure 1-1). Therefore, ambitious action by power companies will be vital to keep global warming within the 2°C limit. The power sector is expected to decarbonize through a shift in electricity generation from centralized to decentralized production and from fossil fuels to renewables. Besides the measures taken by the power sector itself, companies in other sectors can influence the use of low-carbon energy by investing in options, such as wind, solar, and geothermal energy sources.

Decoupling emissions from economic growth will also be a critical component of a future, low-carbon economy and is possible. For example, the largest 100 electric power generators in the US achieved a 12 percent reduction in $CO_2e$ emissions from 2008 to 2013, even as the total amount of generation increased (CERES 2015). For such decoupling to be achieved, companies will have to avoid investments in carbon intensive infrastructure to prevent locking themselves in to a high-carbon growth path and/or having stranded assets on their balance sheets that would have to be retired early in order to meet the 2°C limit.

**Why Should my Company Care?**

Smart companies understand the risks posed by climate change and demonstrate leadership by setting SBTs. Companies that set SBTs build long-term business value and safeguard their future profitability by (see Chapter 2 for further discussion):

- Building business resilience and increasing competitiveness
- Driving innovation and transforming business practices
- Building credibility and reputation
- Influencing and preparing for shifts in public policy

**Purpose of the Manual**

This manual is a guide to develop SBTs. It incorporates best practices and lessons learned from the SBT initiative's work. In particular, it incorporates the criteria and recommendations from the initiative's Call to Action campaign as best practice, but does not require any of these criteria to be met within the context of this "how-to" manual.

**Who Should Use This Manual?**

This manual should be used by companies (and any supporting consultants) considering or in the process of developing a new GHG emissions reduction target, or adjusting a previous target. Companies may also use this manual to establish whether existing targets are aligned with science and as a framework for their GHG management strategy. Additionally, investors, environmental groups, policy makers, and academics can use this manual to learn about best practices for setting SBTs.

**What Is in This manual?**

The bulk of this manual guides the reader at a high level through the different steps of setting an SBT, including defining the business case (Chapter 2), understanding how to apply the various SBT methods (Chapters 3 and 4), getting internal buy-in (Chapter 5), and communicating the target and performance progress (Chapter 6). Two technical annexes provide more in-depth, technical information on available methods and choosing amongst these methods.

**How Was This Manual Developed?**

This manual was developed through a multi-stakeholder process coordinated by the SBT initiative. A technical advisory group of experts from industry and NGOs provided detailed input on multiple drafts. In addition, more than 20 companies with experience in setting SBTs were interviewed to understand

best practices and develop examples. A draft of the manual was also released for a public comment to gain additional input from stakeholders world-wide. This process included a webinar and in-person workshops in Washington, DC; Mumbai, India; and São Paulo, Brazil.

# 2. Making the Business Case for Science-based Targets

This chapter outlines how companies can benefit from setting emissions reduction targets and specifically highlights the drivers for setting ambitious SBTs.

## 2.1. Benefits of Setting SBTs

Arbitrary targets or targets based on what is confidently achievable or what sector peers are doing may result in some business advantages, but SBTs allow a company to capitalize on these benefits to their fullest extent and move beyond incremental change (Table 2-1). Recognizing the power and utility of SBTs, more than two hundred companies have committed to set an SBT through the SBT initiative's Call to Action campaign.

| **Land Securities: Company quote** |
|---|
| Tom Byrne, Energy Manager at Land Securities: "Ultimately, the science brings meaning, and grounds our ambition in reality: targets are no longer numbers pulled from thin air, they are goals linked to a real issue. Science-based targets commit us to what is required, not just what is achievable. In this sense, they prove leadership and provide the 'spine' of a long-term sustainability strategy." |

**Table 2-1. The Benefits of Adopting an SBT**

| Opportunity | Common Practice – Incremental Targets | Science-based Targets |
|---|---|---|
| Build business resilience and increase competitiveness | A reduction in GHG emissions often corresponds to decreased costs and an increase in a company's operational efficiency. | Incremental targets may limit companies to only going after the "low hanging fruit". Methods to set SBTs challenge business to re-align with the low-carbon economy, capitalizing on a range of opportunities beyond cost-savings. |
| Drive innovation and transform business practices | Setting targets can inspire companies and supply chain actors to discover novel solutions and product offerings. Because targets are near-term and not a "stretch", companies may not be pushed to transform business practices. | Because SBTs include a long-term vision, companies can think beyond the near-term, common solutions for GHG emissions reductions. New technologies and financing options can be developed in a corporate environment that prioritizes preparing for a low-carbon economy. |
| Build credibility and reputation | Companies that are transparent in their GHG reduction efforts garner reputational credibility through demonstrating their commitment to addressing climate change. However, investors and other stakeholders are now demanding targets based on external, science-driven projections, which could put these companies at risk. | SBTs have higher credibility with stakeholders. Science is requiring companies to increase their level of ambition. Companies with SBTs are often lower-risk options for long-term investment. |

| Opportunity | Common Practice – Incremental Targets | Science-based Targets |
|---|---|---|
| Influence and prepare for shifts in public policy | Incremental targets send a signal to policy makers that companies take climate change seriously. | SBTs help companies adapt to changing policies and send a stronger signal to policymakers, allowing companies to better influence policy decisions. |

**Build Business Resilience and Increase Competitiveness**

By reducing the GHG emissions from its operations and value chain, a company can increase its resilience and competitiveness in a low-carbon economy. Achieving steeper emissions reductions can help a company save more money with respect to energy costs from manufacturing and logistics operations, amongst others, and therefore can increase its competitiveness. Also, decreasing energy consumption reduces a company's exposure to the risks associated with fossil fuel price fluctuations.

SBTs can also help companies achieve higher internal rates of return on investments than competitors (We Mean Business 2014).

**P&G: Ambitious Targets Spurring Innovation and Energy Savings**

In FY14/15, Procter & Gamble (P&G) set an SBT of a 30% reduction in absolute scope 1 and 2 emissions by 2020, from a 2010 base year. Renewable energy will be key to helping the company achieve its goal. P&G has partnered with EDF Renewable Energy to build a 100MW wind farm in Texas. According to P&G, it will provide "enough wind power electricity to manufacture 100% of our Fabric and Home Care products...in the U.S. and Canada[v]." This is equivalent to eliminating 200,000 metric tons of GHGs per year.

P&G is also looking to its employees to find new ways to reduce energy. The company launched a program called the "Power of 5" designed to give employees a channel to share their ideas to reduce energy usage and save money. So far, the program has generated more than $25 million in new, energy-saving opportunities, which will be implemented over the next two to three years.

**Drive Innovation and Transform Business Practices**

Having aggressive reduction targets can drive greater innovation and investment. Ambitious targets can motivate employees from all parts of a business to think beyond incremental changes and be truly transformational in their business practices.

Innovation motivated by ambitious targets can lead to new business models and sources of value. Innovation can help redefine a company's bottom line by creating new products, new ways to source materials, new ways to interact with customers, and new ways to grow markets. Radical innovation can, in turn, disrupt currently unsustainable economic systems. Ambitious targets can also spur innovative financing practices such as internal carbon pricing or carbon taxes. Creative financing practices can enable the significant capital and research and development (R&D) investments needed to achieve ambitious targets and achieving these targets can, in turn, result in an improved bottom line.

**Dell: Innovation in Sold Products and Services**

The energy used by Dell's products is the largest contributor to its total carbon footprint and innovations in product energy efficiency are a key part of its overall emissions reduction strategy. As part of its SBT, Dell committed to reduce the energy intensity of its product portfolio 80% by 2020, from a 2011 base year. Dell is leveraging technology across its product lines, such as laptops, desktops, servers, and networking equipment, to meet this target. One example of this innovation is

Dell's new generation of blade servers which act like a streamlined data center, with a much smaller GHG footprint than typical data centers. Customers gain space and processing power, free up their IT team and reduce their power costs by up to 20 percent, compared to identically-configured competitive offerings.

Dell's Principal Environmental Strategist, John Pflueger, said: "Engineers love data! Give them the data and they will respond. They can now go in and work out where the biggest energy footprints are in the company. They have a licence to innovate in order to meet the business strategy goals. The fact is if you want to solve a problem, you need to know the scale and nature of the problem you are trying to solve. When you have this information and these insights, then you know what you need to do."[vi]

**Walmart: company quote**

Fred Bedore, senior director of sustainability at Walmart: "I think whatever's right in front of you feels the most difficult, but that's also where a lot of the breakthrough innovation happens. […] With setting science based targets, not only is that probably the longest time horizon for one of our specific goals, but it's also probably one of the most aggressive and comprehensive goals that we've set as a company. So I think it will really push us and push our stakeholders to really get to those innovations."

**Kellogg Company: Innovation in Supply chains**

As part of its SBT, Kellogg Company has committed to reduce absolute scope 3 emissions 20% by 2030 and 50% by 2050, from a 2015 base year.

This is Kellogg's first quantitative scope 3 target and to achieve it the company is engaging its suppliers to establish a base year GHG inventory and identify what changes can be made. Since Kellogg set this target, it has already engaged 75% of its suppliers (over 400 in total), encouraging them to respond to the CDP questionnaire on emissions and materials to help them understand the challenge and available options. Kellogg also has 35 programs around the world to help farmers decrease their footprint, and is supporting half a million farmers to implement smart agricultural practices focused on emission reductions and resiliency. Kellogg is also collating the research results and lessons learned and sharing them with individual farmers.[vii]

**Build Credibility and Reputation with Employees, Customers, Investors, and Other Stakeholders**

SBTs represent a rigorous, non-arbitrary approach to set stretch goals and help create a pathway for meaningful GHG emission reduction efforts. Setting targets backed by an external community of climate experts lends credibility to corporate sustainability goals and can enhance a company's reputation in the eyes of its employees, customers, policy makers, environmental groups, and other stakeholders.

Companies might also gain reputational advantage with some investors. More investors are recognizing the materiality and risk of climate change for many sectors. For example, since 2010, there has been a 54% rise in the number of institutional investors (from 534 to 822) requesting disclosure of climate change, energy and emissions data through CDP (CDP 2015b). As of 2016, sixty percent of the world's 500 biggest asset owners are acting to reduce their exposure to climate risk and increase their investment in the low carbon economy (AODP 2017).

The visibility and positive reputation garnered by having an SBT should also bolster general employer attractiveness. For example, a survey by Net Impact showed that 80% of millennials want to work for a company that cares about its impacts.

**Investors Increasing Interest in Climate Risk and Opportunity**

The investment community is increasingly recognizing the material risk climate change poses for many sectors, either in terms of how it impacts a given company or how that company understands and manages its risk. Some examples of investor initiatives include:

- The Global Investors Coalition on Climate Change (GICCC), a joint initiative of four regional climate change investor groups, issued a Statement at COP 21 endorsed by 409 investors representing more than US $24 trillion in assets. The investors committed to several steps, including to "work with the companies in which we invest to ensure that they are minimizing and disclosing the risks and maximizing the opportunities presented by climate change and climate policy[viii]."
- The Sustainable Accounting Standards Board (SASB), a non-profit organization, is creating industry standards for the disclosure of material sustainability information in mandatory SEC filings that investors can use to assess and make decisions about a company.
- The French government now mandates that financial institutions disclose their climate risk.
- The 2015 UN Paris Agreement on Climate Change commits governments to "Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development. (UNFCCC 2015)"
- The Task Force on Climate-related Financial Disclosures (TCFD) is developing voluntary, consistent, climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers, and other stakeholders.

**NRG Energy: Using SBTs to Future-proof Business**

NRG Energy provides electricity to nearly 3 million retail customers across the United States. It has committed to reduce absolute scope 1, 2 and 3 emissions 50% by 2030, and 90% by 2050, from a 2014 base year. NRG has been investing heavily in clean energy with a view to becoming the leading green energy producer in the U.S. "Setting a science-based target directly answered the needs of our customers, all of whom are thinking about their own footprints. It is also critical for investors who need to know that we are thinking of potential risks, in the short-, medium- and long-term," said Laurel Peacock, Sr. Sustainability Director at NRG. "Having an ambitious target […] is important to show that we will remain reliable, sustainable, safe suppliers now and in the future.[ix]"

**Land Securities: Company quote**

Tom Byrne, Energy Manager at Land Securities: "Having our target approved has undoubtedly enhanced our reputation and relationship with investors. We are now an even better long-term investment prospect. As long as we keep updating it in line with the latest science, our target future-proofs us for investor requirements for the next 50 years. In the sustainability team we are increasingly taking calls from investors who want to talk about what we're doing. Some are thinking about setting their own science-based targets, while others are thinking of making them a requirement for companies they invest in."

I think the target also puts us in a good position vis-à-vis government regulation. We are fully compliant with the UK government's existing targets, and would be well placed were they to introduce more stringent regulation for companies. Indeed, I think that industry is now leading government on this: we are showing what companies can do on their own, and hopefully creating an environment in which others will follow suit and the bar will be raised."[x]

| **Coca-Cola Enterprises: Company Quote** |
| --- |
| **Joe Franses, Director of Corporate Responsibility and Sustainability at Coca-Cola Enterprises:** "Many of our major retail customers - including Tesco, Carrefour and Sainsbury's - are also putting in place plans to significantly reduce their own carbon emissions and emissions across their own supply chains. This means that major suppliers, including CCE, will need to ensure that carbon reduction targets are fully aligned. We expect the same of our suppliers."[xi] |

**Influence and Prepare for Shifts in Public Policy**

Setting and meeting SBTs can reduce a company's exposure to more stringent emissions and energy regulations, helping it smoothly adapt to regulatory and policy changes that might otherwise impact daily business operations and impede financial growth. Leading companies' adoption and implementation of SBTs also demonstrates the technical and economic feasibility of low-carbon production for policymakers and other stakeholders.

Companies with SBTs can also influence policy by signaling their support for low-carbon policies and creating demand for low-carbon technology pathways and renewable energy solutions that would benefit from more favorable policy conditions.

| **Company quote: Dell** |
| --- |
| John Pflueger, Principal Environmental Strategist at Dell: "I think the American Business Acts on Climate Pledge was a real watershed moment. It was a big signal from the Federal government that companies needed to start looking seriously at these issues. The government doesn't just set rules and a culture, but it is also a potential customer. It can indicate its support for low-carbon innovation by purchasing those products, so in that sense, having a science based target should stand us in good stead". |

Setting an SBT is not at odds with economic growth. As demonstrated by the benefits noted above, aspiring to innovative business strategies can catalyze financial success and prepare a company to thrive in a low-carbon economy. Companies will collectively benefit from an environment that remains conducive to business and mitigates disruption to business operations. In order to ensure this future state, companies will need to set targets that are in line with the global 2°C limit.

# 3. Understanding Science-based Target Setting methods

This chapter describes the general methodological approach for setting an SBT. It then provides a high-level description of the specific methods currently available and guidance on how to choose amongst those methods.

Annexes 1 and 2 of this Guidance provides further, technical guidance on these issues.

**Key Insights in This Chapter**

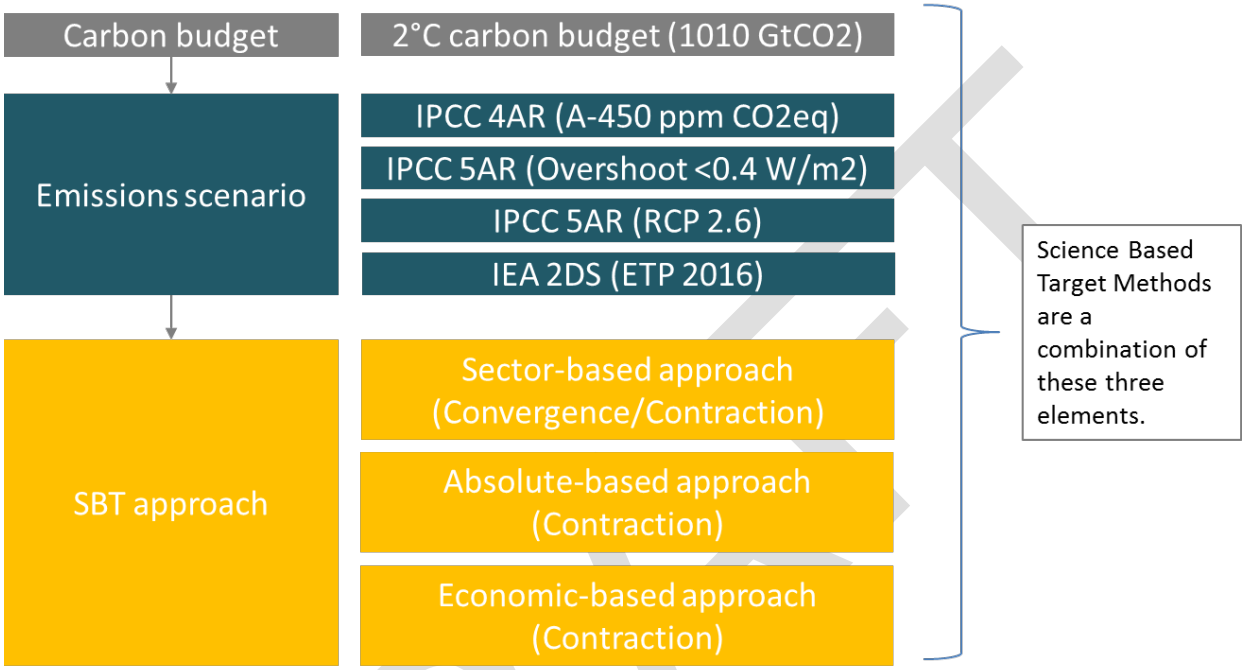
- The key components of an SBT method are the carbon budget (defining the overall amount of GHGs that can be emitted to limit warming to within 2°C), emissions scenario (defining the magnitude and timing of emissions reductions), and allocation approach (defining how the budget is allocated to companies).
- Six methods are currently available that each have applicability to multiple sectors.
- Some methods will be more suitable for certain companies/sectors than others.
- Companies should not to default to the "easiest" option, but should choose the method and target that best drives emissions reductions to demonstrate sector leadership.
- Companies should use either a sector-based method or an absolute emissions contraction approach to calculate SBTs.
- Economic intensity targets may be set. In general, however, an intensity target should only be set if it leads to absolute reductions in line with climate science or is modeled using a sector-specific decarbonization pathway that assures emission reductions for the sector as a whole.

## 3.1 Components of a science-based target method

In general, an SBT method comprises three components (Figure 2-1):

1. A carbon budget
2. An emissions scenario
3. An allocation approach.

Figure 2-1. Main Elements of Methods for Setting SBTs




**Carbon Budget:** There is a finite amount of carbon that can be emitted into the atmosphere before warming will exceed specific temperature thresholds. This amount is termed the carbon budget. All SBT methods are based on keeping the total cumulative global emissions below the total available carbon budget for a 2°C threshold. This budget is 1010 $GtCO_2$ from 2013 (IPCC 2014b) or 700 $GtCO_2$ from 2017 (Rockström et al. 2017).

**Emissions Scenario**: An emissions scenario mainly represents a way of distributing the available carbon budget over time. Although it is not possible to predict exactly when and to what extent GHGs will be emitted in the future, several scenarios have been developed by organizations such as the IPCC and the International Energy Agency (IEA)[xii].

The scenarios vary, depending on assumptions made about population and economic growth, and about technological advances and their cost-effectiveness. The scenarios may also cover different time periods or be modelled using information on GHG concentrations or temperature increases (see Annex 1 for more details). In addition, scenarios vary in terms of the extent to which they are disaggregated by sector and/or region.

**Allocation Approach**: An allocation approach refers to the way the carbon budget underlying a given emissions scenario is allocated among companies with the same level of disaggregation (e.g. in a region, in a sector, or globally).

The SBT methods referenced in this manual use two main approaches to allocate emissions at a company level:

1. **Convergence**, where all companies within a given sector reduce their emissions intensity to a common value by 2050 as dictated by a global 2°C pathway (e.g., the emissions intensity of all electric power companies converges to a maximum of 29 g $CO_2e$ per kWh of electricity in 2050). The reduction responsibilities allocated to a company vary depending on its initial carbon intensity and growth rate relative to those of the sector, as well as the sector-wide emissions intensity compatible with the global 2°C pathway. The convergence approach can only be used with sector-specific emissions scenarios and physical intensity metrics (e.g., tonnes GHG per tonne product or MWh generated).
2. **Contraction**, where all companies reduce their absolute emissions or economic emissions intensity (e.g., tonnes GHG per unit value-added) at the same rate, irrespective of initial emissions performance, and do not have to converge upon a common emissions value. The contraction approach can be used with sector-specific or global emissions scenarios.

## 3.2 Method parameters

In addition to the carbon budget, emission scenario and allocation approach, each method requires company data inputs and generates outputs that can be used as a benchmark to inform target setting.

**Company Inputs**

Company-specific data needed to produce a target under any of the SBT methods include:

- base year
- emissions in the base year, disaggregated by scope
- activities in the base year (e.g., building floor area, distance travelled, value added, etc.)
- target year

Some methods require additional company inputs such as sector classification. Annex 2 lists the primary information needed by each of the methods.

Because each method is sensitive to the inputs used, and errors can propagate throughout the methods, company data should be as accurate as possible (see also Chapter 4.3).

**Projected Outputs**

Depending on the method, the target output can be an absolute figure, an intensity figure, or both. An absolute target is defined in terms of an overall reduction in the amount of GHGs emitted to the atmosphere by the target year, relative to the base year (e.g., reduce annual $CO_2e$ emissions 25% by 2025, from 2000 levels). In turn, an intensity target is defined by a reduction in emissions relative to a specific business metric, such as production output or financial performance of the company (e.g., tonne $CO_2e$ per tonne product produced or value added).

Depending on reporting and communication preferences, a company can choose to use the target format output by a method and/or translate it to other formats (e.g., use production data to convert an absolute target into an intensity target).

Below are illustrative examples of published absolute and intensity targets:

<u>Examples of Absolute targets:</u>

- Scopes 1 and 2: Procter & Gamble commits to reduce emissions from operations 30% by 2020 from a 2010 base year.

- Scopes 1, 2 and 3: General Mills commits to reduce absolute emissions 28% across its entire value chain (scopes 1, 2 and 3), from farm to fork to landfill by 2025, using a 2010 base year.

Examples of Intensity targets:

- Scope 1: Enel commits to reduce $CO_2$ emissions 25% per kWh by 2020, from a 2007 base year.
- Scopes 1, 2 and 3: Thalys commits to reduce corporate scope 1, 2 and 3 GHG emissions per passenger kilometer by 41.4% by 2020, compared to a 2008 base-year.

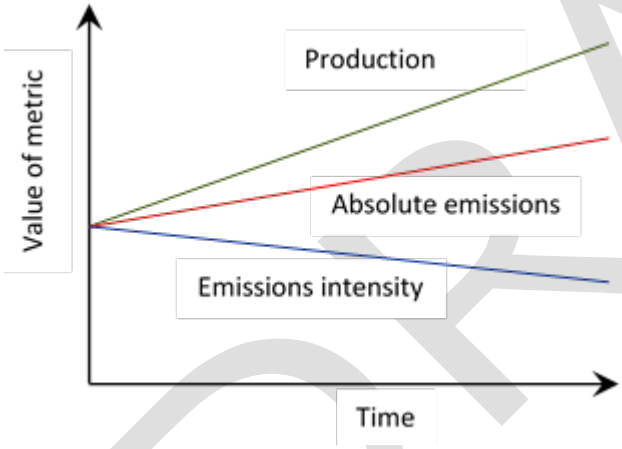
Example of Combination (Absolute and Intensity) targets:

- Scopes 1, 2 and 3: Coca-Cola Enterprises commits to reduce absolute GHG emissions from their core business operations 50% by 2020, using a 2007 base-year. Coca-Cola Enterprises also commits to reduce the GHG emissions from their drinks 33% by 2020, using a 2007 base-year.

**Comparing Absolute and Intensity Targets**

Each type of target has advantages and disadvantages. For example, intensity targets do not necessarily lead to reductions in absolute emissions. This is because increases in business output can cause absolute emissions to rise even if efficiency improves on a per unit basis. Figure 3-1 illustrates this point.

Figure 3-1. Intensity Reduction Targets Can Lead to Absolute Emissions Increases When Production Levels Increase




Another challenge with intensity targets is that it can be difficult to come up with a single, meaningful activity metric that covers all of a company's operations, particularly when those operations generate a diverse product mix. Physical intensity metrics (e.g., tonnes GHG per tonne product or MWh generated) are best suited for use within sectors that create a uniform product ("homogeneous" sectors, such as the steel or cement sectors). Economic intensity metrics (e.g., tonnes GHG per unit value-added) are best suited for use within sectors whose products vary a lot and are difficult to directly compare against each other ("heterogeneous" sectors, such as the retail or chemical sectors). However, an economic intensity metric may not correlate with product emissions and, if prices of a company's products are volatile, an economic metric is not useful for tracking emissions performance (see also Chapter 3.3).

Absolute targets also have some shortcomings. They do not allow comparisons of GHG intensity amongst peers and they do not necessarily track with efficiency improvements, as reported reductions

can result from declines in production output, rather than improvements in performance. Table 3-1 summarizes the main advantages and disadvantages of both types of targets.

**Table 3-1.** The Main Advantages and Disadvantages of Absolute and Intensity Targets

| | Absolute Target | Intensity Target |
|---|---|---|
| **Advantages** | Designed to reduce the quantity of GHGs emitted to the atmosphere by a specific amount<br><br>Environmentally robust and more credible to stakeholders as it entails a commitment to reduce total GHGs by a specified amount, thus also making the contribution to global emissions reductions efforts predictable and transparent. | Reflects GHG performance and efficiency improvements independent of business growth or decline<br><br>May increase the comparability of GHG performance amongst companies |
| **Disadvantages** | Does not allow comparisons of GHG intensity/efficiency to that of peers<br><br>Reported reductions can result from declines in production/output, rather than improvements in performance<br><br>Target may be more challenging to achieve if the company grows and growth is linked to GHG emissions | Less environmentally robust and less credible to stakeholders because absolute emissions may rise even if intensity decreases (e.g., because output increases more than GHG intensity decreases).<br><br>Companies with diverse operations may find it difficult to define a single common business metric.<br><br>An economic intensity metric may not correlate with emissions tied to physical production processes. |

## 3.3 Selecting an SBT method

**Available Methods**

This guidance manual provides details on six SBT methods, all of which are free, publicly available, and applicable to more than one sector (Table 3-2).

1. One method uses convergence of emissions intensity to create physical intensity targets: Sectoral Decarbonization Approach (SDA).
2. One method uses contraction of absolute emissions to create absolute targets: Absolute Emissions Contraction[xiii]. The SDA also uses contraction of absolute emissions for a general "Other Industry" sector, which comprises manufacturing sectors for which data aren't available to support the use of the convergence of emissions intensity approach (see Annex 1).
3. Four methods use contraction of economic intensity to create economic intensity targets: Corporate Finance Approach to Climate-stabilizing Targets (C-FACT), Climate Stabilization Intensity Targets (CSI), Context-based Carbon Metric (CSO), and Greenhouse Gas Emissions per Value Added (GEVA).

These methods also vary in terms of their sector disaggregation. The SDA is based on sectoral 2°C pathways and can be applied to specific sectors (see Box 3-1). Still other methods can be used with any sectoral emissions scenario (Absolute Emissions Contraction) or can be adapted for use with any scenario (GEVA, CSI, CSO) – the level of sector disaggregation of these methods will therefore depend on that of the underlying scenario. Annex 2 further details the key features of each method.

Beyond these six methods, it is expected that new scenarios and methods will be developed for a range of specific sectors. Information on these will be posted to the SBT initiative's website as the methods are made publicly available and/or validated by the initiative.

Currently, available data do not support the disaggregation of emissions pathways by country or region; see Annex 1 for further details.

**Table 3-2:** Key Features of SBT Methods

| **Method** | **Allocation approach** | **Sectors** | **Type of Target Output** |
|---|---|---|---|
| Absolute Emissions Contraction | Contraction of absolute emissions | Depends on emissions scenario | Absolute |
| Corporate Finance Approach to Climate-stabilizing Targets (C-FACT) | Contraction of emissions intensity | Depends on emissions scenario | Absolute and economic intensity |
| Climate Stabilization Intensity Targets (CSI) | Contraction of emissions intensity | Depends on emissions scenario | Economic intensity |
| Context-based Carbon Metric (CSO) | Contraction of emissions intensity | Depends on emissions scenario | Economic intensity |
| Greenhouse Gas Emissions per Value Added (GEVA) | Contraction of emissions intensity | Depends on emissions scenario | Economic intensity |
| Sectoral Decarbonization Approach (SDA) | Convergence of emissions intensity | Various | Physical intensity |
| | Contraction of absolute emissions | 1 sector covering miscellaneous manufacturing industries | Absolute |

**Box 3-1.** SDA Sectors

Currently, the SDA provides sector-specific pathways for the following sectors[a]:

- Power Generation
- Iron & Steel
- Cement
- Aluminum
- Pulp & Paper
- Chemicals[b]
- Services / commercial buildings
- Passenger transport

The SDA also calculates SBTs for a general "Other Industry" sector that covers the construction industry and a wide range of manufacturing sectors (e.g., food and beverage, electronics, machinery).

*Notes*:

a. The SDA sectors are drawn from the International Energy Agency (IEA). An appendix in the SDA user guidance maps the IEA sectors against common industrial classification systems: http://sciencebasedtargets.org/wp-content/uploads/2015/05/Sectoral-Decarbonization-Approach-Report.pdf.
b. The heterogeneity of the chemical sector limits the present utility of this SDA pathway.

**Choosing an SBT Method**

The SBT initiative recommends companies use either a sector-based method (SDA) or Absolute Emissions Contraction.

An economic contraction method may also be used to set an economic intensity target (using C-FACT, CSI, CSO, or GEVA). In general, an intensity target should only be set if it leads to absolute reductions in line with climate science or is modeled using a sector-specific pathway (e.g., SDA) that assures emission reductions for the sector as a whole.

Because intensity and absolute targets each have advantages and disadvantages, it is recommended that companies express their targets in both absolute and intensity terms.

If a company operates in more than one sector, it should identify the top sectors that cover a majority of its operations. The methods that apply to these sectors can then be used as a benchmark to determine the aggregated final target. For example, a company might operate in the aluminum sector and have power generation operations to support the aluminum production. In this case, the company could set two different targets using both the aluminum and power generation sector pathways in the SDA. Similarly, a company could use multiple methods for different scope 3 emissions categories (see Chapter 4.3). A company should develop an aggregated target that applies across its entire structure for external reporting and communication, although separate internal targets may be developed by region, sector, facility, or emissions category for ease of tracking and execution.

Companies Should Choose the Most Ambitious Target

In some cases, variation will exist in the ambition and reduction pathways of targets output by the different methods. For example, different scenarios in the IPCC's Fifth Assessment Report result in required reductions of 49% and 66% between 2010 and 2050 (see Annex 1).

To help ensure adherence to the carbon budget, companies should not default to the target that is easiest to meet. Companies should instead use the most ambitious decarbonization scenarios and methods that lead to the earliest reductions and the least cumulative emissions. A company should screen several of the methods and choose the method and target that best drives emissions reductions to demonstrate sector leadership. Method selection may also be influenced by practical considerations, such as the availability of input data for the base year and target year.

Electric Power Generation Companies

Electric power generation companies should set scope 1 targets that are at least as ambitious as those determined by the SDA. This is because the power sector is the single largest contributor to global GHG

emissions (Figure 1-1) and can cost-effectively reduce its emissions by an amount that may be underestimated by other methods.

Setting SBTs in Sectors with Price Fluctuations

For sectors with limited fluctuations in product prices over time, growth in emissions is often tied to economic growth of the company: if a company sells more products, more emissions are produced to make those products. In such cases, an economic intensity target may be appropriate.

For some sectors the financial growth of a company is not always tied to increased emissions and can be influenced by other market forces, such as supply and demand, and price fluctuations. For example:

- A pharmaceutical company's prices for certain drugs may fluctuate based on demand, patents, or regulatory factors.
- The value added (or gross profit) of a luxury brand company can be related to marketing and consumer willingness to pay for a premium product, introducing variability into pricing.
- The price of many commodities (e.g., metals and agricultural commodities) is set by trades placed on commodity exchanges.

In such cases companies should develop SBTs using the contraction of physical intensity (SDA) or the contraction of absolute emissions.

# 4. Setting a Science Based Target

This chapter outlines a stepwise process for using the SBT method(s) to inform a scope 1, 2, and 3 target. It incorporates the existing criteria and recommendations from the SBT initiative's Call to Action campaign as best practice. Because SBTs are built upon corporate GHG inventories, this chapter also references relevant requirements in GHG Protocol standards for GHG inventory development.

This chapter first discusses core recommendations and steps that apply across all scopes in designing an SBT. It then outlines specific recommendations for scope 1 and 2 targets and, separately, scope 3 targets. It closes with guidance on how SBTs should be adjusted over time to ensure their continued relevance, as well as with options for the third-party review of proposed SBTs.

The Call to Action's criteria and recommendations may change slightly over time to incorporate further lessons learned. Users are encouraged to consult the current list of the Call to Action's criteria and recommendations, available from the SBT initiative's website[xiv].

**Key Insights in This Chapter**

- An SBT should cover a minimum of 5 years and a maximum of 15 years from the date the target is publicly announced. Companies are also encouraged to develop long-term targets (e.g., through 2050).
- The boundaries of a company's SBT should align with those of its GHG inventory.
- The emissions reductions from scope 1 and 2 sources should be aligned with 2°C decarbonization pathways.
- SBTs should cover at least 95% of company-wide scope 1 and 2 emissions.
- Companies should use a single, specified scope 2 accounting approach ("location-based" or "market-based") for setting and tracking progress toward an SBT.
- If a company has significant scope 3 emissions (over 40% of total scope 1, 2 and 3 emissions), it should set a scope 3 target.
- Scope 3 targets generally need not be science-based, but should be ambitious, measurable, and clearly demonstrate how a company is addressing the main sources of GHG emissions within its value chain in line with current best practices.
- The scope 3 target boundary should include the majority of value chain emissions; for example, the top 3 categories or two-thirds of total scope 3 emissions.
- The nature of a scope 3 target will vary depending on the emissions source category concerned and the influence a company has over its value chain partners, as well as the quality of data available from those partners.
- SBTs should be periodically updated to reflect significant changes that would otherwise compromise their relevance and consistency, over time.
- Offsets and avoided emissions should not count toward SBTs.

## 4.1 Follow steps that apply across all scopes

A variety of considerations and steps apply across all three scopes:

**Choose a Base Year**
The meaningful and consistent tracking of emissions performance over the target period requires companies to establish a base year.

Two criteria are important for selecting a base year: verifiable data on scope 1, 2, and 3 emissions must exist for the base year, and the base year must be **r**epresentative of a company's GHG profile.

The SBT initiative recommends choosing the most recent year for which data are available as the target base year. Sometimes, individual years may not serve as representative base years. In such cases, companies could average GHG data for multiple, consecutive years to form a more representative base year that smooths out unusual fluctuations in emissions. For example, a company that had an uncharacteristic year in 2009 could set its target as: 'By 2025 emissions will be 40% lower than average emissions for the 2008-2010 period'.

Also, the base year should be chosen such the target is forward-looking and does not cover progress-to-date already achieved by the company. While companies deserve credit for past progress, the integrity of an SBT would be suspect if there is little left to accomplish by the time the target is announced.

Finally, various factors may necessitate recalculations of the base year (and SBT as a whole) to ensure the continued relevance of the SBT. See Chapter 4.4 for further guidance on this topic.

**Choose a Target Year**
The impacts of climate change will be felt for years to come. Setting long-term SBTs (e.g., through 2040 or 2050) encourages planning to manage the long-term risks and opportunities connected with climate change. These may include the creation of new services and markets, and the need for large capital investments that offer GHG benefits. However, long-term targets alone do not match the decision horizons of many companies and might encourage later phase-outs of less efficient equipment. Mid-term targets (those between 5 and 15 years in the future) can be instrumental for identifying inefficiencies and opportunities for emission reductions.

Companies should set a target that covers a minimum of 5 years and a maximum of 15 years from the date the target is publicly announced. It is also recommended to set long-term targets beyond this interval and set interim milestones at five-year intervals. Interim targets should be aligned with the emission scenario used to set the SBT; see Annex 1 for further guidance.

Companies should be aware that SBT setting methods vary in the earliest possible base year (often 2010) and the latest target year (often 2050). Where the latest possible target year is earlier than 2050 (2025 in the case of the CSO method), companies can use those methods and extend the projections mathematically or consider other methods to develop long-term targets.

| **Various companies: Framing and Communicating Short and Long-term Targets** |
| --- |
| • Pfizer determined it needed to reduce its emissions 60 to 80% by 2050 from 2000 levels, in order to stay on a 2°C trajectory. Doing so would require a 20% reduction by 2020, from 2012 levels. Setting a 2050 goal alone would be challenging because of the uncertainties introduced by a long target period. Pfizer therefore uses the nearer-term (2020) goal, but clearly communicates that it is on track to meet the 2050 target. |

- Nestlé made a 2020 commitment, which is on the trajectory to a 2050 target. However, Nestlé believes that shorter-term targets have more meaning and create more ownership among employees who may still be there in 2020 and thus will feel responsible.
- Mars has both 2020 and 2040 targets, and benchmarks itself on a 3% annual reduction with an eye on efficiency activities that are underway. It believes the shorter-term target engenders greater accountability. But the longer-term goal helps ensure that short-term strategies don't lock it into investments or decisions that would cause it to veer off a low-carbon trajectory after 2020.

**Set Scope 1, 2 and 3 Targets in Tandem**

When setting an SBT, a company should consider all three scopes at the same time. In particular:

- A company should align the boundaries of its SBT with those of its GHG inventory. There are three different approaches for determining which operations are included in an inventory: operational control, financial control and equity share. A company must select a single approach based on a range of company-specific considerations and apply that approach consistently across its corporate structure. The GHG Protocol Corporate Standard (WRI & WBCSD 2004) provides further guidance.
- Companies may set a single target for all scopes (see also Chapter 4.3). In such cases, the scope 1 and 2 portion of the target must be science-based.
- If separate targets are set for different scopes, companies should use the same base year and target year. A common target period will simplify data tracking and communication around the target. Where value chain data are difficult to obtain, however, it is acceptable to use different base years.
- Emissions that fall under one scope should not be added to another scope for the purposes of setting an SBT. For example, the emissions from a company's tier 1 suppliers should not be added to its scope 1 emissions.

**Exclude the Use of Offsets**

The use of offsets should not be counted toward attaining an SBT. Instead, companies should set targets based on reductions within their own boundaries or their value chains. Offsets may be useful, however, as an option for companies wishing to finance additional emission reductions beyond the SBT.

**Exclude Avoided Emissions from SBTs**

Avoided emissions occur outside of a company's scope 1, 2 and 3 inventory and require a methodology informed by project accounting to estimate. Any estimates of avoided emissions must be reported separately from a company's scope 1, 2 and 3 emissions, and should not be counted toward SBTs, including any scope 3 target.

**Determine How to Treat Subsidiaries**

Complex business relationships (subsidiaries, joint-ventures, etc.) can complicate how the target boundary is drawn. Ideally, parent companies should set SBTs for subsidiaries. However, it can be acceptable for a subsidiary to set targets directly if it has operational and managerial independence. And in cases where both the parent company and subsidiary set SBTs, care must be taken to communicate whether the targets overlap.

**Thalys: Setting Targets for Subsidiaries**

International train operator, Thalys, was founded by SNCF, the National Rail Company of Belgium (SNCB), and Deutsche Bahn. Though Thalys is partly owned by SNCF, it operates independently. Thalys has an SBT to reduce scope 1, 2 and 3 GHG emissions per passenger kilometer 41.4% by 2020, from a 2008 base-year. SNCF has also committed to set an SBT and, since it has maintenance responsibility at some of Thalys' sites, will have to distinguish its additional targets from those of Thalys'.[xv]

## 4.2 Model a Scope 1 and 2 Target

An SBT must lead to emissions reductions from scope 1 and 2 sources that are aligned with science. Important steps include deciding which emissions sources to include within the target boundaries and how to account for scope 2 emissions.

**Set Target Boundaries**

Key considerations for setting the boundary of a scope 1 and 2 SBT are:

- Which scopes? SBTs should always cover a company's overall scope 1 and 2 emissions, even if one scope total may seem insignificant compared to the other. This is to ensure that the risks and opportunities of changing energy sources are captured.
- Which GHGs? Based on the GHG Protocol Corporate Standard, inventories and target boundaries must include the emissions of seven different GHGs or classes of GHGs covered by the UNFCCC/Kyoto Protocol: carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexaflouride ($SF_6$), and nitrogen triflouride ($NF_3$).
- Which geographical operations? SBTs should cover the same geographical operations as the corporate GHG inventory.

In general, a company should exclude no more than 5 percent of its aggregate scope 1 and 2 emissions from its inventory and target. Companies should disclose whether and why specific operations and sources have been excluded (see Chapter 6).

**Account for Scope 2 Emissions**

Setting and tracking performance against scope 2 targets entails some unique considerations:

Should a Company Use the "Location-based" or "Market-based" Approach?: Renewable energy is likely to be an instrumental part of corporate strategies to realize SBTs. The GHG Protocol Scope 2 Guidance (WRI & WBCSD, 2015) defines two approaches for calculating the scope 2 emissions from purchases of renewable energy and other forms of energy. The "location-based" approach is designed to reflect the average emissions intensity of grids on which energy consumption occurs and mostly uses grid-average emission factors. In contrast, the "market-based" approach is intended to help companies reflect the emissions impacts of differentiated electricity products that companies have purposefully chosen (e.g., supplier-specific emissions rates and power purchasing agreements).

For the purposes of setting SBTs, companies should choose the results of only one approach when calculating base year emissions and tracking performance. Also, if a company chooses to use the market-based approach, it should assess all contractual instruments for conformance with the Scope 2 Quality Criteria[xvi].

How Should Purchased Heat and Steam be Accounted For?: The emissions from purchased heat and steam fall under scope 2 in a corporate inventory. However, for the purposes of setting an SBT, companies should model heat- and steam-related emissions as if they were part of their direct (i.e.

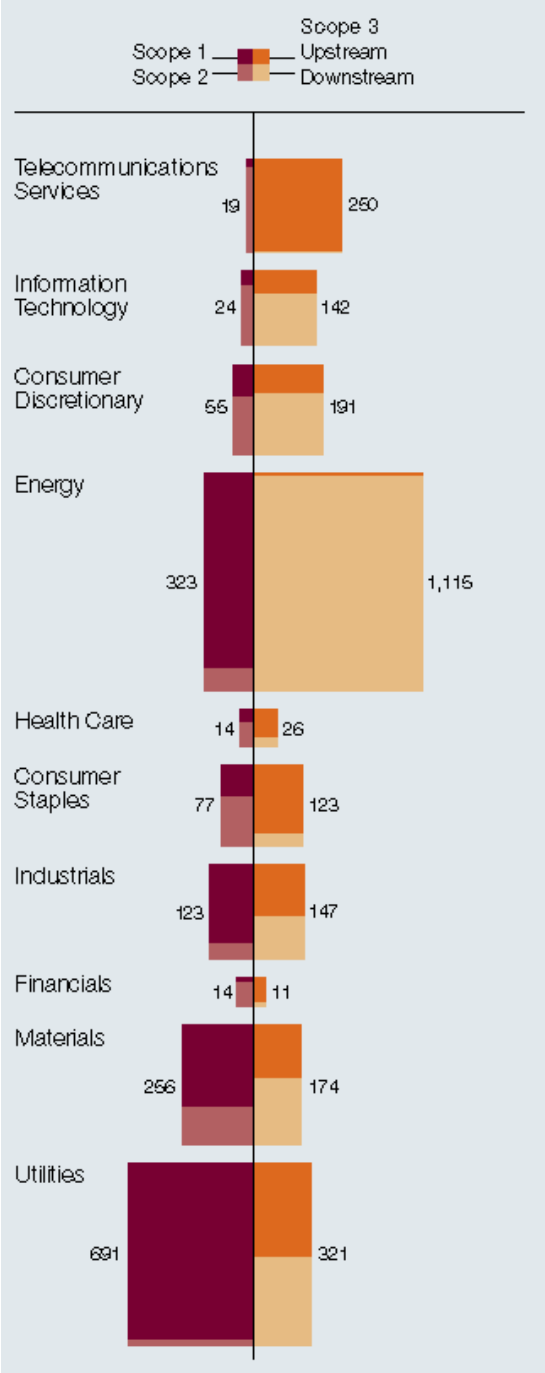
scope 1) emissions. This is because existing SBT methods for scope 2 emissions do not take purchased heat and steam into account.

## 4.3 Model a Scope 3 Target

When companies set targets, they initially focus on scope 1 and 2 emissions because they are generally more able to influence these emissions. However, a company's scope 3 emissions are often much greater (Figure 4-1) and ambitious scope 3 targets can play an integral part in a company's GHG reduction strategy, allowing it to demonstrate performance and leadership, manage supply chain risks and opportunities, and address the needs of stakeholders.

Key steps in setting scope 3 targets as part of an SBT strategy include constructing a scope 3 inventory to assess whether an ambitious scope 3 target should be set and, if so, which scope 3 emissions source categories should be targeted. Subsequent steps include identifying the appropriate type of target and level of ambition for these categories.

**Figure 4-1:** The Relative Magnitude of Scope 1, 2 and 3 Emissions, By Sector




*Notes:* Graph based on CDP data for S&P 500 firms.
*Source*: CDP 2013.

**Conduct a Scope 3 Inventory**

A scope 3 inventory is critical in 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) provides detailed guidance on how to complete a scope 3 inventory. It defines 15 distinct categories of upstream and downstream emissions sources (see Box 4-

1). The Scope 3 Standard requires companies to include all relevant categories in an inventory, based on such criteria as the amount of emissions or the level of influence exerted over the categories (Table 4-1). In general, companies should prioritize activities in the value chain where the reporting company has the potential to influence GHG reductions, but should not exclude any activity that is expected to contribute significantly to the company's total scope 3 emissions. See Chapter 7 of the Scope 3 Standard for further details.

**Box 4-1. The Scope 3 Categories**

**Upstream scope 3 emissions**

1. Purchased goods and services
2. Capital goods
3. Fuel- and energy-related activities (not included in scope 1 or scope 2)
4. Upstream transportation and distribution
5. Waste generated in operations
6. Business travel
7. Employee commuting
8. Upstream leased assets

**Downstream scope 3 emissions**

9. Downstream transportation and distribution
10. Processing of sold products
11. Use of sold products
12. End-of-life treatment of sold products
13. Downstream leased assets
14. Franchises
15. Investments

See Chapter 5 in the Scope 3 Standard (WRI & WBCSD 2011) for a complete description of these categories.

**Table 4-1: Criteria for Identifying Relevant Scope 3 Categories to Include in a Scope 3 Inventory**

| Criteria | Description of Scope 3 Activities |
|---|---|
| **Size** | They contribute significantly to the company's total anticipated scope 3 emissions |
| **Influence** | They offer potential emissions reductions that could be undertaken or influenced by the company |
| **Risk** | They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and customer, litigation, and reputational risks) |
| **Stakeholders** | They are deemed critical by key stakeholders (e.g., customers, suppliers, employees, investors, or civil society) |
| **Outsourcing** | They are outsourced activities previously performed in-house or activities outsourced by the reporting company that are typically performed in-house by other companies in the reporting company's sector |
| **Sector guidance** | They have been identified as significant by sector-specific guidance |
| **Other** | They meet any additional criteria for determining relevance developed by the company or industry sector |

*Source*: Adapted from the GHG Protocol Scope 3 Standard (WRI & WBCSD 2011), Table 6.1.

The development of an initial, screening inventory can be a useful first step toward the development of a comprehensive scope 3 inventory, letting companies understand the relative magnitude of scope 3

emissions overall and identify high-impact categories for which more accurate data are needed. Box 4-2 describes the Scope 3 Evaluator, a tool useful in constructing screening inventories.

Scope 3 Data Quality

Companies are likely to face challenges in collecting data and ensuring data quality for scope 3 sources, because these sources are not under the reporting company's ownership or control. These challenges include:

- Reliance on value chain partners to provide data
- Lesser degree of influence over data collection and management practices
- Lesser degree of knowledge about data types, data sources, and data quality
- Broader need for secondary data (i.e. data that are not specific to a company's value chain)
- Broader need for assumptions and modeling

In general, companies should select data that are the most representative in terms of technology, time, and geography; most complete; and most reliable. Companies should collect high quality ("primary") data from suppliers and other value chain partners for scope 3 activities deemed most relevant and targeted for GHG reductions. Secondary data are acceptable, but do limit a company's ability to track performance. Secondary data are therefore better suited for scope 3 categories that are not significant. Chapter 7 of the Scope 3 Standard provides further guidance on data quality issues.

If scope 3 emissions compose over 40% of total scope 1, 2 and 3 emissions, companies should develop an ambitious and quantitative scope 3 target that covers a sizeable portion of scope 3 emissions. Subsequent sections of this chapter expand on this recommendation.

**Box 4-2: The Scope 3 Evaluator Tool**

GHG Protocol teamed up with Quantis, a consultancy, to develop a free scope 3 screening tool. This tool provides users with a simple interface to make a first, rough approximation of their full scope 3 inventory, regardless of their organization type and size. The tool leads users through a series of questions about their organizational structure and their activities, such as the purchase of goods and services, use of fuels, transportation of materials, and more.

Linking these inputs to a combination of economic input-output and process life cycle inventory data, the tool provides the user with a scope 3 inventory which can be used as an initial basis for identifying reduction areas, public reporting, and informing future efforts to produce a more accurate emissions inventory. Companies should work to collect primary data for categories shown to be a significant percent of their total Scope 3 inventory.

For more information, see https://quantis-suite.com/Scope-3-Evaluator/resources/Quantis_Scope3_Evaluator_Checklist_20150325.xlsx

**Identify Which Scope 3 Categories Should be Included in the Target Boundary**

Using a scope 3 inventory, companies can identify which categories should be included in the boundary of a scope 3 target(s). The criteria in Table 4-1 can also be used to guide this approach (see Box 4-3 for an example).

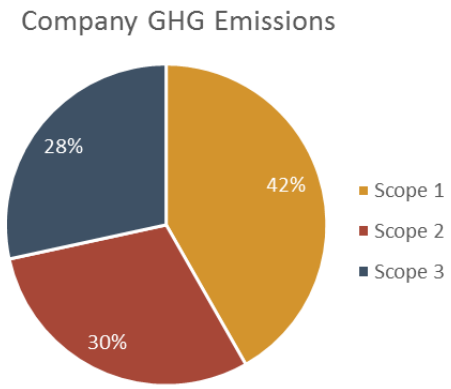
Across sectors, purchased goods and services and the use of sold products account for the majority of scope 3 emissions (CDP 2016). These categories will therefore be integral to many companies' targets. However, the relative importance of different scope 3 categories will vary by sector. Scope 3 categories likely to be important (in terms of emissions magnitude) for companies in specific sectors include:

- Automotive: Use of sold products
- Chemicals: End of life treatment of sold products
- Consumer Packaged Goods: Purchased goods and services
- Electronics: Use of sold products
- Food Processing: Purchased good and services
- Gas Distribution and Retail: Use of sold products
- Logistics: Upstream transportation and distribution
- Oil & Gas: Use of sold products[xvii]

Overall, the scope 3 target boundary should include the majority of value chain emissions; for example, the top 3 categories or two-thirds of total scope 3 emissions.

**Box 4-3: Determining Relevant Scope 3 Categories**

An international industrial chemical and gas company conducted a screening inventory of its full value chain and determined that scope 3 emissions contributed almost 50% of its total footprint.




Recognizing that scope 3 was a significant contributor to overall emissions, the company then investigated which of the 15 scope 3 categories contributed most to scope 3 emissions. Three categories were not applicable for the company and were not included in the inventory (categories 10, 13, and 14). Conducting the inventory for the remaining categories led the company to focus its target setting activities on the three categories that accounted for the majority of emissions: upstream fuel and energy, use of sold products, and investments.

| Category | Scope 3 Emissions (mmt CO2e) | % of Scope 3 Emissions |
|---|---|---|
| 1. Purchased goods and services | 773,731 | 8% |
| 2. Capital goods | 35,054 | >1% |
| 3. Fuel- and energy-related activities (upstream) | 5,152,751 | 51% |
| 4. Upstream transportation and distribution | 125,000 | 1% |
| 5. Waste generated in operations | 10,667 | >>1% |
| 6. Business travel | 41,526 | >1% |
| 7. Employee commuting | 39,742 | >1% |
| 8. Upstream leased assets | 32,170 | >1% |
| 9. Downstream transportation and distribution | 221,217 | 2% |
| 11. Use of sold products | 2,150,739 | 21% |
| 12. End-of-life treatment of sold products | 116,379 | 1% |
| 15. Investments | 1,347,360 | 13% |

**Determine Whether to Set a Single Target or Multiple Targets**

Companies can choose to set multiple, category-specific targets or a single target covering all relevant scope 3 categories. They may also choose to set a single target covering total scope 1, 2 and 3 emissions. Each type of target boundary has advantages and disadvantages (see Table 4-2).

**Table 4-2.** Advantages and Disadvantages of Different Target Boundaries Covering Scope 3 Emissions.

| Target Boundary | Example | Advantages | Disadvantages |
|---|---|---|---|
| **A single target for total scope 1, 2 and 3 emissions** | • Autodesk: reduce total scope 1, 2, and 3 emissions 43% by 2020 from 2008 levels.<br>• Capgemini UK PLC: reduce total scope 1, 2, and 3 emissions 40% by 2030, from 2014 levels.<br>• General Mills: reduce scope 1, 2, and 3 emissions 28%, from farm to fork to landfill by 2025, using a 2010 base-year. | • Ensures more comprehensive management of emissions across the entire value chain<br>• Offers greater flexibility on where and how to achieve the most cost-effective GHG reductions<br>• Simple to communicate to stakeholders<br>• Does not require base year recalculation for shifting activities between scopes (e.g., outsourcing) | • May provide less transparency for each scope 3 category<br>• Requires the same base year for the different scopes, which may be difficult if scope 1 and 2 base years have already been established |
| **A single target for total scope 3 emissions** | • EDP: reduce absolute scope 3 emissions 25% by 2030, from 2015 levels.<br>• Kellogg Company: reduce absolute value chain emissions 20% by 2025, from 2013 levels. | • Ensures more comprehensive GHG management and greater flexibility on how to achieve GHG reductions across all scope 3 categories (compared to separate targets for selected scope 3 categories)<br>• Relatively simple to communicate to stakeholders | • May provide less transparency for each scope 3 category<br>• May require base year recalculation for shifting activities between scopes (e.g., outsourcing) |
| **Separate targets for individual scope 3 categories** | • Dell: reduce the energy intensity of product portfolio 80% by 2020, from 2011 levels.<br>• Panalpina: reduce scope 3 emissions from outsourced transportation and business travel 15% by 2025 from 2013 levels.<br>• See below for further examples | • Allows customization of targets for different scope 3 categories based on different circumstances<br>• Provides more transparency for each scope 3 category<br>• Provides additional metrics to track progress<br>• Does not require base year recalculations for adding additional scope 3 categories to the inventory<br>• Easier to track performance of specific activities | • More complicated to communicate to stakeholders<br>• May require base year recalculation for outsourcing or insourcing<br>• May allow increases in absolute emissions and/or emissions intensity from other categories, unless those categories also have their own targets |

**Identify an Appropriate Method and Level of Ambition**

A company's scope 3 targets should clearly demonstrate that it is addressing the main sources of GHG emissions within its value chain in line with current best practice. Scope 3 targets should be ambitious, although they generally need not be science-based. While existing SBT methods can be used to set scope 3 targets, a range of other, non-emissions-based targets can also be set for specific scope 3 categories, as long as the emissions reduction benefit can be quantitatively demonstrated.

Overall Preference Hierarchy for Scope 3 Targets

Table 4-1 lists the advantages and disadvantages of different, general classes of scope 3 targets. In general, percentage-based emissions reduction targets are preferred over non-emissions-based targets, which should only be set when a company cannot acquire the emissions data needed to set the former. If a goal is set around engaging a certain percentage or number of suppliers, then the engagement must encourage emissions reductions that are quantifiable (see discussion below).

**Table 4-1. Different Types of Scope 3 Targets**

| Target | | Example | Advantages | Disadvantages |
|---|---|---|---|---|
| Percentage-based emissions reduction targets | Percentage-based absolute emissions target (in line with 2°C pathway when possible) or intensity target based on the SDA | Swisscom: reduce scope 3 emissions 18% by 2020 from 2013 levels | Transparent about direction of change in absolute emissions and/or emissions intensity<br><br>Target ambition more easy to compare across companies | Can be challenging to set for scope 3 sources over which a company has little influence |
| | Other, percentage-based emissions intensity target resulting in ambitious reductions in absolute emissions | To provide | | |
| Non-emissions-based targets | Performance-based target expressed in absolute or intensity terms | AMD: improve the compute performance per watt of energy consumed by mobile APU processors 2500% by 2020, from 2014 levels | Does not require emissions data from value chain partners | Not transparent about direction of change in absolute emissions |
| | Target to influence the behavior of suppliers or customers | L'Oréal: By 2020, suppliers representing 80% of direct spend will set an emissions reduction target and report activities to reduce emissions through CDP<br><br>Colgate-Palmolive: promote water conservation awareness to 100% of its global consumers | May be useful if a company has yet to identify levers for more specific reduction opportunities amongst its value chain partners<br><br>May drive reduction behaviors that benefit other customers of the same supplier<br><br>Useful when company has mostly indirect spend, such that its best reduction lever is to ask suppliers to reduce their emissions (since company does | May not be effective in driving ambitious reductions in the emissions from purchased goods and services if majority of emissions come from tier 2 suppliers or beyond<br><br>May not foster collaboration along the value chain |

| | | | | |
|---|---|---|---|---|
| | | | not spend enough to warrant collaborations) | |

*Note*: Companies mentioned in the table may have set more than one type of scope 3 target that are not reflected in this table.

Recommended target types for key scope 3 categories are provided below.

Using Existing SBT Methods for Scope 3

Two methods - Absolute Emissions Contraction and the SDA – can be used to set percentage-based emissions reduction targets. The economic-based approaches are not recommended unless they result in ambitious reductions in absolute emissions.

The SDA should be used by the manufacturers of light-road passenger vehicles to set scope 3 targets for the use of sold products. Otherwise, the SDA should only be used for scope 3 targets when: (1) the GHG emissions of tier 1 suppliers are significant, relative to those of suppliers further removed from the company; and (2) scope 1 and 2 data can be obtained from the tier 1 suppliers. The SDA is most appropriate for buildings (leased assets and franchises) and upstream or downstream transportation and distribution for these reasons.

A further disadvantage of using the SDA is that it can limit options for tracking reductions in certain categories, depending on how comprehensive a company's overall scope 3 target is. For example, a construction company could set an intensity target for purchased steel using the iron and steel pathway in the SDA. Because this pathway does not support material switching to less GHG-intensive steel substitutes, the company could only meet this target by reducing the GHG-intensity of purchased steel. This problem can be circumvented by setting a target (or targets) for all purchased goods and services.

Setting Targets for Purchased Goods and Services (Category #1)

As noted above, percentage-based emissions targets are preferred. Companies may also set a range of other targets (Table 4-3) for purchased goods and services, as long as the expected emissions reduction benefit can be quantitatively shown. These targets may relate, for example, to ensuring that top suppliers set and report progress toward their own targets ("top supplier commitments"), eliminating the use of GHG-intensive materials, or increasing the use of reusable materials.

Top supplier commitments are not recommended when the majority of category 1 emissions come from tier 2 suppliers or suppliers even further removed from the reporting company. Top suppliers can be identified on the basis of spend and/or emissions impact. Top supplier commitments may alternately focus on "critical suppliers" or "strategic suppliers" that the company has already identified based on a variety of factors, such as operational risk. Spend data and critical supplier lists are advantageous when they can reliably serve as a proxy for leverage over suppliers. However, the biggest suppliers by spend are not always the biggest GHG emitters, so companies should make sure that targets based on spend or critical suppliers also cover the majority of category 1 emissions. Ideally, top supplier commitments should focus on suppliers setting SBTs.

Companies should not set targets that benchmark performance against sector average values. This is because such targets are not transparent about changes in emissions performance. They may also change over time with changes in sector performance, reducing the ability to track long-term changes in performance.

**Table 4-3.** Recommended Types of Non-emissions Targets for Purchased Goods and Services.

| **Type of Non-emissions Target** | **Example** | **Conditions** |
|---|---|---|
| General sourcing commitment | All goods and services will be procured from suppliers with | • Suppliers must report the quantitative GHG benefit of their actions annually |

| | | |
|---|---|---|
| | existing SBTs or with GHG reduction practices in place | |
| Eliminate or reduce use of GHG-intensive materials | Nike and leather<br><br>Proctor & Gamble: ensure zero deforestation in the palm oil supply chain | • Material must significantly contribute to total emissions from purchased goods and services<br>• Emissions reduction benefit can be quantitatively demonstrated |
| Adopt sector best practices | 100% of crop suppliers reduce fertilizer application rates and use slow-release fertilizers or nitrification inhibitors | • Emissions reduction benefit can be quantitatively demonstrated |
| Increase use of reusable materials | Increase recycled content in packaging to 80% by 2015, from 2022 levels | |
| Top supplier commitment | 80% of key suppliers (representing 80% of category 1 emissions) set SBTs by 2025. | • Companies should preferably commit to getting their suppliers to set SBTs<br>• Top suppliers identified on basis of emissions impact, spend and/or "critical supplier" criteria. Targets based on spend or critical supplier criteria should cover the majority of category 1 emissions.<br>• Suppliers should report on progress toward targets annually |
| Reduce emissions compared to industry benchmark | Emissions intensity of purchased goods' production will stay 30% below sector average values | • Never use this type of target because it is not transparent and will change over time |



Setting Targets for Use of Sold Products (Category #11)

Products can have direct use-phase emissions, such as when an appliance uses electricity or when an air-conditioner emits refrigerants. Products may also have indirect use phase emissions; for example, apparel when washed with hot water or food when cooked. Under the GHG Protocol Scope 3 Standard, direct use-phase emissions must be reported in scope 3 inventories, while indirect use-phase emissions are optional.

Companies should set a quantitative target for direct use-phase emissions. The target should be emissions-based (either absolute or intensity-based) or performance-based. Example from DELL: reduce the energy intensity of product portfolio 80% by 2020, using a 2011 base-year.

A target around the entire life cycle may alternatively be set and is preferred when trade-offs have been identified or are suspected across the product lifecycle (e.g., a more energy efficient product might have higher emissions in the production phase, compared with a less energy efficient product).

Targets for indirect use-phase emissions are optional and can be set around influencing the behavior of customers. Example from Colgate-Palmolive: Promote water conservation awareness to 100% of its global consumers.

Setting Targets for Upstream or Downstream Transportation and Distribution (Categories #4 and 9)

Percentage-based emissions targets (either absolute or intensity) are preferred. For example:

- International Post Corporation: Reduce emissions 20% per letter and parcel delivery by 2025, from a 2013 base-year (scopes 1, 2 and 3).

Goals around specific practices (e.g., mode or fuel switching and logistics management) can be used to support the target, but should not represent the primary target because of possible trade-offs in emissions with different sources. For instance, switching from oil- to gas-powered vehicles may incur increases in the emissions from upstream fossil fuel production.

## 4.4 Adjust Targets to Ensure Continued Relevance

To ensure consistent tracking of performance over time, a company should recalculate its SBT, as needed, to reflect significant changes that would otherwise compromise the target's relevance. Recalculation should be triggered by significant[xviii] changes in:

- Company structure (e.g. acquisition, divestiture, mergers, insourcing or outsourcing)
- Methodology for calculating the base year inventory (e.g., improved emissions factors or activity data)
- Methodology for calculating the target (e.g., emissions scenarios, growth projections and other assumptions)
- Recalculations should also be performed for the discovery of significant errors

Long-term targets, in particular, may require recalculation to update the company growth assumptions used to project the target and also to reflect the latest climate science. For example, targets could be recalculated to align with the latest emissions scenarios available from the IPCC or other scientific bodies, as these scenarios are published.

Recalculation should not be triggered by organic growth and decline, which is defined as "increases or decreases in production output, changes in product mix, and closures and openings of operating units that are owned or controlled by the company" (WRI & WBCSD 2011, 106).

In general, companies should check their targets annually and no less than every five years. When target projections have changed, companies should keep their short-term targets and recalibrate their long-term target trajectory as short-term targets come due for renewal.

## 4.5 Secure Third Party Review

While there is no standard against which to assure SBTs, the emissions inventory itself should be verified. Additionally, a company can have a third party review the processes and data it used to calculate the target, as well as ensure the target is aligned with the chosen SBT method and this manual's recommendations. One option for validating targets is through the SBT initiative's Call to Action campaign, which offers a process to technically review and check the quality of a company's target. Companies can mention such a third-party review in their public communications.

# 5. Building Internal Support for Science-based Targets

SBTs represent a new way of setting goals for many companies and often yield more ambitious targets than traditional target-setting approaches. As such, gaining buy-in across business units and up the chain to the C-Suite may require careful justification. This chapter explores how to get company stakeholders on board through all stages of the target-setting process and how to navigate potential challenges and push-back while doing so.

**Key Insights in This Chapter**

- Staff responsible for setting an SBT should partner closely with all levels of the company during the target-setting process to socialize goals, assess feasibility, and co-create practical implementation plans.
- Staff should anticipate the issues that commonly create internal push-back and formulate ready-made responses.
- For scope 3 targets, companies should work closely with and support suppliers during the target-setting process to increase buy-in and enable implementation.

## 5.1 Get All Levels of the Company on Board

During the process of determining an SBT, the sustainability team must often build support from both executive leadership and business unit managers in order to access resources for developing, finalizing, announcing, and ultimately achieving the target.

Useful strategies for securing internal support include:

1. Partner closely with the business units and socialize the target at the grass roots:
   - Ask each department to offer what it can feasibly do to meet the target and avoid putting all the responsibility on any single business unit.
   - Get commitments from operations to make the needed reductions and show, through bottom-up analysis, how the target will be achieved. This will help in obtaining approval from senior leadership if it has not already asked for an SBT.
   - Find internal champions within influential departments – people not on the sustainability team but who will support the target.
2. Don't give a business unit a target it has little control over; doing so is de-motivating.
3. If a company operates in multiple countries, consider having champions at the country level who can engage country operations to identify reduction opportunities.
4. Make a good business case, including points on risk mitigation and showing financial returns where possible:
   - Indicate how much money the SBT will help the company save.
   - Create a balanced portfolio of projects with short and long-term pay-back periods.
   - Show how the SBT contributes to core business strategy and how the target can help mitigate risk.
   - Don't discount the contribution that smaller projects, such as facility energy efficiency measures, can have on the overall target. Such contributions can be collectively significant.
5. Make it easier and more desirable for business units to meet the target:

- Assist business units in conducting analyses and offer feasible ideas that the units can practically implement.
- Allow the business units to keep the money they save from the emissions reduction projects they implement.
- Set short-term, interim targets to create a sense of urgency and collective ownership.

6. Enlist outside help:
   - When necessary, partner with NGOs or consultancies that understand the science behind SBTs and can provide guidance in setting an SBT.
   - Work with the government, suppliers, customers, and other stakeholders to better understand the available options.
   - For scope 3, take time to describe to value chain partners the target(s) and general best practices for reducing emissions (and, if a top supplier commitment has been set, best practices for calculating and reporting these reductions).

| **Land Securities: Company Quote** |
| --- |
| Tome Byrne, Energy Manager at Land Securities: "Another challenge was how to make the link between the macro issue of climate change, which people see on the news, and the specific details of a science-based target. In this sense, the internal consultations and workshops were really important. We started with the sustainability team and moved out, via more senior directors who we knew were interested in these issues (the 'early adopters'), to the most senior reps who we needed to convince. By having others on board already, and by being able to show how the science informs the target and links back to the global situation, it was much easier to get sign off from the top. We had a really powerful message that empowered people and made the ambitious targets much more palatable". |

| **Pfizer: Company Quote** |
| --- |
| Sally Fisk, Senior Corporate Counsel and Environmental Sustainability Advisor at Pfizer: "Across a large network of diverse sites, our Global Engineering group has worked hard to engage our colleagues to ensure they understand the value of energy efficiency and renewable energy and feel empowered to seek out opportunities to make GHG reductions rather than viewing the request to make reductions as a burden. Communication was a key element to ensuring that colleagues from other parts of the business understood the potential global implications of climate change and therefore the need to act. Having a nearer term goal (2020) with a longer-term vision (2050) approved at the executive leadership level really helped our team to obtain buy-in."[xix] |

Defining the target and getting approval are not always a linear process and can involve feedback loops or some back-and-forth with leadership and business units before the target is approved. To have greater confidence in securing support it is important to:

**Understand the Audience**

Employees outside of sustainability roles don't typically have a background in climate science but they could be very familiar with the concepts of climate change and sustainability. Finding the right starting point for making the case for an SBT will be critical to getting those in the room on board. For some audiences this may mean explaining in clear terms the IPCC's findings and the necessity for companies

to reduce emissions in line with science. Other groups may be ready to jump into discussing the target itself. The SBT initiative provides some helpful resources for communicating SBTs.

**Make the Case with Data but Don't Underestimate the Importance of Interpersonal Skills**
A recent survey of sustainability professionals found that interpersonal skills are the most important factor in being a successful sustainability leader. Because achieving an SBT will take the cooperation of multiple divisions within a company, it is important to develop relationships and build networks to assist in this endeavor.

Also critical is the ability to make the case with data. While the SBT approach is relatively new, there is a good body of evidence to support the business benefits of setting ambitious GHG targets (see Chapter 2). Quantifiable benefits from GHG emission reductions include cost savings, energy savings, and an improved bottom line. Other important benefits of setting an SBT should also be brought into the discussion. These include driving innovation, enhancing credibility and reputation, and demonstrating leadership.

**Communicate the Target in Business Terms**
Framing targets in terms such as risk, opportunities, revenue and reputation, rather than in climate or sustainability jargon, will resonate with corporate decision makers. And while getting decision makers on board is critical to setting and achieving a target, targets should also be clearly communicated in business language to all employees within an organization.

**Engage Employees Across the Company Early On**
Internal audiences to consider include almost every department in a company from facilities operations to procurement. In particular, management, employee "Green Teams", communications departments, and departments directly involved in substantial emissions reduction activities should be informed of the target. It is also important that the teams responsible for the activities and projects to reduce GHG emissions have had some role in validating the feasibility of their portion of the target and are not just informed of the target after it has been announced. Investing in employee awareness-raising can engender a supportive company culture and may inspire employees that were not directly involved in the target-setting exercise to create innovative new solutions to cut GHG emissions.

The earlier and more effectively the importance of reaching targets is communicated to an employee, the more likely the company is to get buy-in for target efforts. Consider integrating ways to describe and work toward the target into employee orientation and training/handbooks. Periodic announcements and company/departmental meetings are also a potential avenue for communicating progress. Likewise, written media such as company newsletters, blogs, and social media are good places to highlight achievements and areas for improvement.

## 5.2 Address Challenges and Push-back

Before approving an SBT, a commitment that affects multiple divisions, resources and budgets within a company, leadership will likely raise some important questions.

- **If our target is tied to our future growth rate, change in market share, or other aspect of business strategy, what are we required to disclose publicly? Do we need to be concerned with confidentiality?**

Intensity targets set using a sector-specific method or using an economic intensity approach will generally be tied to metrics such as market share, estimated production growth, financial growth rates, or contribution to GDP. However, it is not necessary to publicly disclose the assumptions used to determine the target and all sensitive information can remain confidential while still announcing the SBT.

- **Our initial target is for just 5 years from now. How are we going to get there?**

Shorter-term targets can be validated by putting together and summing the emissions reduction potential of multiple projects, including anticipated renewable energy purchases, plans for changes in product design or suppliers, adoption of new technologies, and planned changes in product mix. Many companies use typical business metrics to determine which projects are viable, including IRR, ROI, and payback periods. Combining these measurements with estimated GHG savings will help to build a project portfolio that makes reduction targets achievable. This group of projects can then be presented as part of the target-setting package.

Alternatively, some companies are satisfied to set a target in line with science and then let the target be the motivator for discovering projects and fostering innovation. While this this is a less systematic approach, it can be just as successful in some company cultures.

- **What if we don't hit our announced target?**

Although the plan for achieving an SBT may be carefully thought out, some companies may not achieve their target (or interim targets) due to unexpected circumstances. These might include, for example, stronger than predicted organic growth or delays in bringing renewable energy projects on line. In such cases, companies can help retain the confidence of their stakeholders by transparently communicating their situation, including progress achieved to date and remaining reduction gaps. Describing the plan for moving forward and how the target gaps will be addressed is equally important.

These and other communication and reporting issues are discussed in more detail in Chapter 6.

# 6. Communicating the Target and Progress

The effective communication of an SBT guides internal management decisions, increases buy-in from employees, and enhances corporate reputation. Furthermore, it sends positive messages to the business community and policymakers. Once a target has been set, communicating it fully, simply, and clearly is important to accurately inform stakeholders and build credibility.

This chapter outline the key steps in communicating SBTs and performance progress, including defining the audience, deciding where to disclose SBT-related information, and determining what information to disclose.

**Key Insights in This Chapter**

- Companies should follow the GHG Protocol accounting and reporting principles to disclose quantitative and qualitative aspects of the SBT so that audiences can fully understand the SBT's context, implications, and nuances.
- Companies should report annual progress in reaching their targets.
- SBTs should be communicated in understandable terms and in engaging ways, such as through diagrams and infographics, while avoiding jargon.

Key communication steps include:

## 6.1 Define the Audience

It is important to first define the primary audience before determining what and how to communicate the SBT. Customers, suppliers, competitors, partners, and investors may all have an interest in a company's GHG emissions reduction efforts. Companies should first identify the interest the external party has and be sure to emphasize aspects of target setting that are relevant to the party. It is also important to keep in mind that some information used in target setting may be considered confidential (e.g., projected activity data) and that messaging may need to be tailored to protect sensitive information. However, this should not prevent a company from effectively communicating its SBT to external audiences. Regardless of the audience, SBTs should be communicated in understandable terms (see Box 1).

**Box 1: Communicating SBTs in Understandable Terms**

In addition to ensuring that sufficient detail is included when communicating an SBT for a technically-minded audience, a company should also present this information in a way that is jargon-free and understandable to the general audience.

For example, to the lay person with a limited environmental or financial background, the intensity metric $mtCO_2e$/value added may be confusing or meaningless. Any absolute or intensity metric should be defined either in a glossary or within the text of the communication itself. Using "real life" examples or comparisons such as "this reduction equals taking 4,000 passenger vehicles off the road annually" can be helpful for both external and internal audiences in understanding the magnitude of a company's progress. The US EPA's Greenhouse Gas Equivalencies Calculator[xx] is a useful tool for equating a quantity of emissions with real-life emissions sources, such as vehicles, power plants, or home energy use.

Even those groups with extensive background knowledge may also benefit from clarification. For example, the term "value added" (which can be used as the denominator of an intensity metric) can be defined as gross profit, operating profit, EBITDA minus all personnel costs, or revenue minus the cost of purchased goods and services, depending on local accounting terminology. Using language without climate science and financial jargon can provide clarity and reduce confusion. For example, "direct emissions" can be used in place of or alongside the term scope 1 emissions.

The challenge lies in ensuring that a simplified, layman's description of an SBT continues to reflect scientific grounding and does not convey inaccurate information. For this reason, the SBT initiative recommends using links or footnotes to provide access to the full, technical description of the target, even in communications intended for a non-technical audience.

**Table B1-1.** Terms that Simplify Technical Jargon

| Technical Term | Layman's Term |
|---|---|
| Scope 1 emissions | Direct emissions |
| Scope 2 emissions | Emissions from purchased heat and electricity |
| Scope 3 emissions | Value chain emissions |
| Science-based target | Emissions target supported by climate science |

## 6.2 Decide Where to Disclose

Setting an SBT can differentiate a company as a leader and so it is in the company's interest to disclose the target in a place that is easy to find, such as on the company sustainability webpage. Company reports (e.g., sustainability reports, CSR reports, annual reports, and strategic plans) are also good platforms upon which to periodically report on progress and integrate this information with the other activities of the company.

The Global Reporting Initiative (GRI)[xxi] provides a widely-used framework for reporting environmental, social, and economic performance and impacts. SBTs and reduction efforts can be included in GRI reports although they may not be highlighted to the same degree that a separate webpage or company report would afford.

CDP's Climate Change Questionnaire[xxii] is also a well-known public resource for reaching large external audiences. CDP provides a platform to disclose climate leadership to investors, purchasers, and

governments. CDP also communicates SBTs to the NAZCA platform[xxiii], which tracks significant commitments made by "non-state actors", including companies, as part of the UNFCCC's Action Agenda.

## 6.3 Follow Guiding Reporting Principles

It is essential to disclose all pertinent aspects of the target so that the audience can fully understand its context, implications, and nuances. The GHG Protocol Corporate Standard (WRI & WBCSD 2004) defines five overarching principles that should guide the development of corporate GHG inventories. These same principles should also be used to describe the target and report on progress.

- **Relevance:** Ensure the target appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.
- **Completeness:** Account for and report on all GHG emission sources and activities within the chosen target boundary. Disclose and justify any specific exclusions.
- **Consistency:** Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
- **Transparency:** Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
- **Accuracy:** Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

Specific recommendations for describing the target and reporting on progress are given below.

## 6.4 Describe the Target

A description of the SBT should include technical information on the boundary and ambition of the target, as well as the assumptions and methods used to set the target. Companies may choose to also include qualitative, contextual information on the target.

**Technical Information on the SBT**

At a minimum, a company should provide the following information:

- Base year and target year (specify calendar or fiscal years)
- The emissions scopes that are and are not included in the target (e.g., whether scope 3 emissions are excluded because they do not account for a significant portion of total emissions) and any future plans to include them
- Percentage of the company's total emissions covered by the target
- Whether targets are measured on an absolute and/or intensity basis
  - For intensity targets: an explanation of the metric
  - It is best to express intensity targets on both an absolute AND intensity basis
- Percent reductions, for both final and intermediate targets
- Emissions scenario, allocation approach and method(s) used to set target
- The target trajectory used for setting intermediate targets; i.e. annual compound reductions, linear reductions, or a peak and decline pathway (see Annex 1 for more information)

- Whether a location- or market-based approach is used to calculate scope 2 emissions in the base year and track performance against an SBT
- Any other information required by the method (assuming data are not commercially sensitive)
- A link to the company's annual GHG inventory that follows the GHG Protocol Corporate Standard reporting requirements

Companies are also encouraged to specify the actual target emissions level (Mt $CO_2e$) in addition to the percentage reduction.

Scope 3 Targets

The recommendations above also apply to scope 3 targets. For example, for a percentage-based emissions target, a company should disclose the percentage reduction and whether that target is an intensity or absolute target. However, certain of the above recommendations may not be relevant, depending on how the scope 3 target has been set. For instance, it would not be necessary to disclose an emissions scenario if an SBT method has not been used.

In addition, companies should do the following when describing scope 3 targets:

- Describe which scope 3 categories are covered by the target as well as any that are specifically excluded.
- Contextualize the significance of the target by, for example, describing the percentage of scope 3 emissions covered by the target or the size of the scope 3 target relative to that of the company's scope 1 and 2 emissions.

There is no single, prescribed template for communicating a scope 3 target. As with scope 1 and 2 target disclosures, it is important to understand the audience and present the target in a way that is meaningful and relevant to them. It is also important to recognize that achieving a scope 3 target depends on collaboration and cooperation from suppliers, customers and other external stakeholders, so it must be communicated in terms that encourage them to be motivated to contribute.

**Qualitative, Contextual Information**

Explaining the context for a target has two important benefits. First, stakeholders will better understand the significance of the target, thereby recognizing the company's leadership on climate change. Second, the company will contribute its voice to a larger narrative on how corporate climate action is both feasible and smart. Contextual information can include:

- Motivation: Why did the company commit to such significant emissions reductions? Why is following climate science important to corporate leadership? The answers to these questions are illuminating for stakeholders, journalists, and others who are interested in business management trends and/or climate change. They might provide an incentive to others to contribute to the target or follow suit by setting an SBT at their own organization.
- Relationship with broader company objectives: Many companies will explore radically different business models, technologies, operational procedures, suppliers and other business practices in order to become a low-carbon business. Stakeholders may require a full understanding of the company's current standing and vision for the future when considering an SBT. Therefore, the company may wish to connect the target to its strategic, financial, and operational plans.
- How the company will cut emissions: While most companies will not have a fully engineered plan for meeting their SBT at the outset, they may be able to provide near-term examples of the steps they will take to reduce emissions. Tangible examples that are easy to visualize are helpful; for example, a company may state, "We plan to put solar panels on 20% of our facilities next year."

- The case for following climate science: SBTs are notable because they support the global effort to prevent the most dangerous consequences of climate change. It is important for stakeholders to understand that climate science can and should guide decisions on emissions reductions. Suggested talking points are provided in the box below.
- Links to awards, press coverage, and other notable communications materials.

| **SBT Talking Points** |
| --- |
| • The science tells us that we must cut global GHG emissions by up to 72% by 2050 to prevent catastrophic and irreversible climate change. This will require global transformational change.<br>• Companies must set GHG reduction targets that align with best-available climate science in order to transform their business for a low-carbon future.<br>• Smart companies know that setting ambitious targets is in their own self-interest. SBTs can help drive innovation and secure long-term competitive advantage.<br>• Setting long-term, meaningful targets sends a clear signal to stakeholders as to where a company is headed, and provides the context for strategic investments needed to transform business models.<br>• In December 2015, nearly every nation on earth signed the historic Paris Agreement, agreeing to limit warming by 1.5°C to 2°C over pre-industrial levels. Now companies must do their part to fulfill that promise, and an emissions target that aligns with this global goal is a critical first step. |

## 6.5 Describe Progress Toward the Target

Companies should report on progress toward their target(s) annually. Showing progress over the target period will help stakeholders better understand a company's progress and efforts before reaching the target year. The following information should be included by a company in communications about its progress:

- A description of the target itself, following the above recommendations
- Emissions changes from the base year to the current year (yearly breakdowns are preferable)
  - Variability between years is expected, so it is important to show trends over multiple years
- When a company has sub-targets for a specific scope or scope 3 category: progress against each sub-target.
- Reasons for substantial emissions variations (e.g., emissions reduction activities, significant increases or decreases in growth, or changes in product lines)
- If progress is not on track or deviates away from the target pathway: explain why and the strategy for addressing these deficits in the future
- Whether the target has been revised, and if so, what changes were made and why (e.g., due to a recalculation of the base year inventory or an update to the emissions scenario)
- Information on successful projects that have helped to reduce emissions
- Novel or innovative efforts or partnerships that have been put into place and can differentiate a company and highlight it as a leader
- Investments or changes that have been made that may not yet have delivered significant results but that are expected to do so in the coming years or that enable the necessary transformation towards the long-term goal.

# Annex 1. Components of a Science Based Target Method

As Chapter 3 summarized, an SBT method has three primary components: a carbon budget, an emission scenario, and an allocate approach that apportions a "share" of emissions to a particular company. This chapter discusses these components in more detail.

**Key Insights in This Chapter**

- The international scientific community estimates the remaining "carbon budget" to be 700 $GtCO_2$ from 2017 onwards.
- A variety of emissions scenarios have been developed that apportion the available carbon budget over time.
- Sector-specific emissions scenarios are available for selected homogeneous sectors.
- Current data sources do not support the geographic differentiation of emissions reduction responsibilities. Attempts to differentiate on the basis of country or region are complicated by equity issues and political considerations, and should not be undertaken.
- It is recommended to use a linear reduction trend when determining company SBTs, instead of a "peak and decline" scenario.
- Convergence is appropriate to project the carbon intensity of companies in sectors where the sector pathways assure emission reductions for the sectors as a whole. Contraction can be applied to both absolute emissions and carbon intensity.

## A1.1 Carbon Budget

The carbon budget is the estimated amount of carbon (or $CO_2$[xxiv]) the world can emit before warming will exceed specific temperature thresholds.

A global warming threshold of 2°C compared to pre-industrial temperatures has been widely adopted as a global goal in national and international climate policy. The IPCC Fifth Assessment Report (AR5) estimated that, for a likely chance of limiting warming to 2°C, the carbon budget is 1010 $GtCO_2$ from 2012 onwards (IPCC 2013). The specific explanation from the AR5 Synthesis Report is that "Multi-model results show that limiting total human-induced warming to less than 2°C relative to the period 1861–1880 with a probability of over 66 percent would require cumulative $CO_2$ emissions from all anthropogenic sources since 1870 to remain below about 2900 $GtCO_2$ (with a range of 2550 to 3150 $GtCO_2$ depending on non-$CO_2$ drivers). About 1900 $GtCO_2$ had already been emitted by 2011. " (IPCC 2014b). Recent data indicate that, for a more than 75 percent chance of limiting warming to below 2°C, the carbon budget is only 700 $GtCO_2$ from 2017 onwards (Rockström et al. 2017).

## A1.2 Emissions Scenarios

The IPCC developed long-term emissions scenarios for its third, fourth and fifth assessment reports that model the emission reductions consistent with the goal of not exceeding 2°C of global warming[xxv]. In the AR5, these scenarios are GHG concentration (not emissions) pathways and are termed

Representative Concentration Pathways (RCPs). Moreover, the IPCC has been asked by the UNFCCC to publish scenarios for well-below 2°C as early as 2017.

Other technical bodies, like the International Energy Agency (IEA), have developed their own scenarios, largely based on the IPCC scenarios, to provide more detailed emission trajectories at the regional and sectoral level. The IEA scenarios are included in its Energy Technology Perspectives (ETP) reports.

A summary of recommended scenarios for setting corporate SBTs is provided in Table A1-1. Some of the SBT methods described in Annex 2 can accommodate various emissions scenarios, whereas others are designed for a specific scenario.

The emissions scenarios in Table A1-1 vary in terms of the emissions reductions required and may also specify a range of values, reflective of the uncertainty in emissions projections. For example, one scenario in the AR5 ("Overshoot<0.4W/$m^{2"}$) specifies a range of between 49% and 72 percent reductions. The 49 percent value is the minimum value compatible with the scenario's assumption that global net negative emissions will be required (-103 to -118%) in the second half of the century to stay under the 2°C threshold. (Clarke et al. 2014). Given the expense and technical challenges related to negative emissions technology deployment, the SBT initiative recommends companies choose the most aggressive mitigation scenario possible.

Many of the 2°C compatible emission scenarios follow a "peak-and-decline" pathway, in which emissions peak at some date (e.g., between 2010 and 2020 in RCP 2.6) before declining[xxvi]. For the purposes of setting a corporate SBT, it is recommended that reductions follow a compounding or linear pathway from the base year to the target year (i.e. that emissions be reduced by the same amount or by the same rate each year). See Box A1-1 for further discussion.

**Table A1-1.** Emission Scenarios Compatible with 2°C Carbon Budget

| Source | Base year | Target year | Percentage reductions required | Sources with which scenario is concerned |
|---|---|---|---|---|
| IPCC – Fifth Assessment Report (5AR): Overshoot < 0.4 W/$m^2$ | 2010 | 2050 | -49% to 72% | All global anthropogenic emissions |
| IPCC – Fifth Assessment Report: RCP 2.6 | 2010 | 2050 | -41 to 72% | All global anthropogenic emissions |
| IEA 2°C Scenario (ETP 2016) | 2013 | 2050 | -56% | Global energy sources |

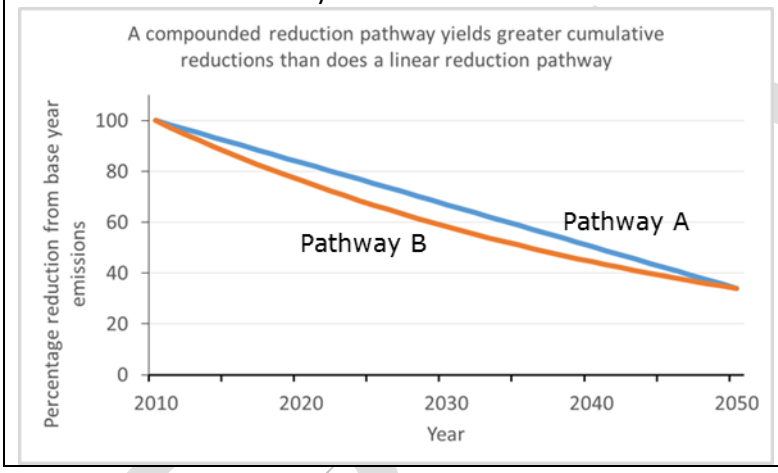
*Sources*: Clarke et al. 2014, IEA 2016, IPCC 2014a.

**Box A1-1:** Setting Company Target Pathways Based on Emissions Scenarios

Companies should ensure that interim targets are aligned with the ambition of the final target and the general pathway for keeping global warming to within 2°C. As with emissions scenarios, the individual company target pathways connecting base years and target years can have different shapes, determined by whether companies assume annual compound or linear reductions, or a peak-and-decline scenario. The area under a company's target pathway represents cumulative emissions, such that different pathways will yield different amounts of cumulative emissions, with different total impacts on the climate. Which pathway is most appropriate for setting interim targets?

In general, a company should use an annual compounded pathway or a linear reduction pathway. For example, RCP 2.6 in the IPCC's 5AR follows a peak-and-decline pathway and requires a 66% reduction between 2010 and 2050. To use this scenario, a company could assume a constant amount of emissions is reduced each year, equal to 1.7% of the base year emissions (=66/[2050-2010]). This scenario results in the linear pathway (A) in Figure A1-1. Alternatively, the company could use a compound annual reduction rate of 2.7%, resulting in the curved pathway (B). Each pathway results in a 66% reduction by 2050, but also in different cumulative emissions. Pathway B requires higher initial reductions, but delivers 17% more cumulative emissions reduction, demonstrating the advantage of early action. It is preferred that companies use a compounded pathway for this reason.

**Figure A1-1**. A Compounded Reduction Pathway Yields Greater Cumulative Reductions Than Does a Linear Reduction Pathway




**Level of Disaggregation in Emissions Scenarios**

Some emission scenarios offer more resolution than others in terms of geographic and sectoral disaggregation. For instance, RCP 2.6 disaggregates $CO_2e$ emissions across five world regions and two broad sectors (energy systems and land-use change). In contrast, the IEA 2DS scenario disaggregates $CO_2$ emissions across nine world regions, five broad sectors and a number of sub-sectors (see below).

Generally, the use of disaggregated emissions scenarios represents a more specific and potentially more equitable trajectory that a company would have to follow to be in line with a 2°C pathway. For instance, an emissions scenario that disaggregates GHG emissions for the power sector would be more informative for an electric power company than an aggregated emissions scenario.

<u>Disaggregating Company SBTs at the Sector Level</u>

Sector-specific emissions scenarios are available for a range of homogeneous sectors. In particular, the ETP 2DS scenario identifies a carbon budget for the energy, industry, transport and buildings sectors consistent with a 2°C scenario. The report also identifies detailed decarbonization pathways for high-emitting industrial sectors, such as cement, aluminum, pulp and paper, etc. These data can help guide companies within homogenous sectors in developing physical intensity targets based on convergence (using the SDA).

In contrast, there is limited information on emissions scenarios and activity metrics for heterogeneous sectors, which limits companies within heterogeneous sectors to contraction allocation approaches. For example, the SDA provides a decarbonization pathway for an "Other Industry" sector, which encompasses sectors that tend to be less homogeneous. This pathway was derived by subtracting the carbon budgets of detailed industry pathways from the overall industry budget. The SDA then uses an absolute contraction allocation approach for Other Industry.

It is expected that emissions scenarios will evolve over time, providing more disaggregation not only for industrial sectors, but also for other sectors in the economy.

Disaggregating Company SBTs at the Country Level

The Paris Agreement specifies roles for developed, developing, and least-developed parties to the agreement. The agreement does not define the boundaries of these categories and leaves it to country parties to present their own nationally-determined contributions to address climate change. Rather than agree on particular emissions allocation processes, countries agreed on the principle of equity and common but differentiated responsibilities (CBDR) and respective capabilities, in light of different national circumstances.

The IPCC and academic literature has extensive discussion of the range of techniques available for geographical disaggregation[xxvii]. Beyond the principle of CBDR, countries have not agreed to any particular technique. Lack of international consensus limits company options for geographical disaggregation. Likewise, while some international modeling efforts such as the IEA's ETP series disaggregate Organisation for Economic Co-operation and Development (OECD) and Non-OECD emissions pathways, these data are not comprehensive or granular enough to address company requirements.

As a result, currently available SBT methods use two simplifying approaches for addressing performance differences among countries: contraction and convergence (see Annex 1.3 for details). For example, the SDA assumes global convergence of key sectors' emissions intensity by 2050; in other words, the emissions intensity of steel production in China, the U.S., and Brazil is assumed to reach the same level, regardless of its current diversity. These approaches have shortcomings of their own, especially from equity perspectives (e.g., mitigation costs may be greater in the steel sector in a particular country). Additional scenarios with geographical disaggregation considering equity issues could be useful to inform SBT methods. In the meantime, companies should use global SBT scenarios to align their emission reduction targets with a 2-degree pathway.

## A1.3 Allocation Approaches

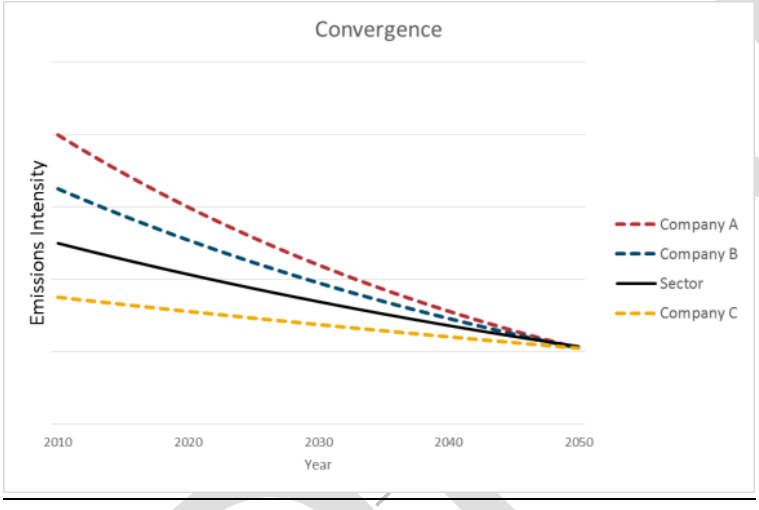
An allocation approach refers to the way the carbon budget underlying a given emissions scenario is allocated amongst companies with the same level of disaggregation (e.g. in a region, in a sector, or globally).

The SBT methods referenced in this manual use two main approaches to allocate emissions at a company level:

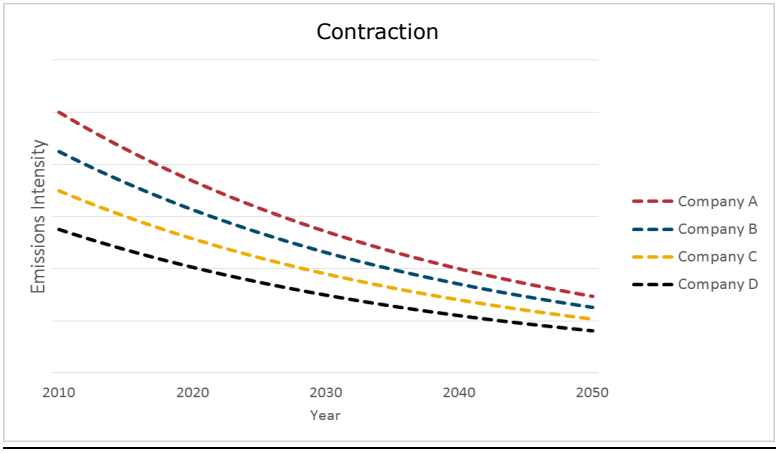
- Convergence, where the emissions intensity of a sector converges to that required by a global 2°C pathway by 2050 (e.g., 29 g CO2e per kWh of electricity).
- Contraction, where all current sources of emissions reduce at the same rate independently of cost, equity, or growth factors.

Convergence is appropriate to project the carbon intensity of companies in sectors with 2°C pathways. Contraction can be applied more broadly to companies' absolute emissions or carbon intensity.

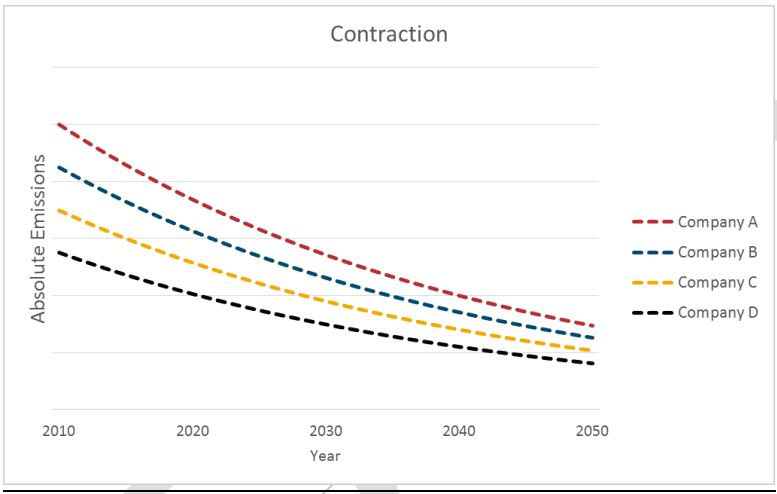
Convergence of Carbon Intensity: This approach assumes that the carbon intensity of all companies within a given sector converges towards the 2°C carbon intensity of that sector at a rate that ensures the sectoral 2°C carbon budget is not exceeded. The rate of convergence of an individual company is a function of the initial carbon intensity of that company, the 2°C carbon intensity of the sector, and the growth of the company relative to the growth of the sector. For example, if a company has a higher-than-average growth rate it must reduce its emissions intensity more rapidly, compared with companies with lower-than-average growth rates. This method can only be used with emissions scenarios that disaggregate emissions at the sector level.




Contraction of Carbon Intensity: This approach assumes that all companies within the same level of disaggregation (i.e. sector, region or globally) reduce their carbon intensity at a parallel rate that ensures the respective 2°C carbon budget (sector, region or global) is not exceeded. Companies do not converge upon a common carbon intensity, but end up with different intensities. The rate of contraction is a function of the carbon budget and the expected level of activity for the sector or region concerned. For example, the required rate of contraction increases as the carbon budget gets smaller or as activity levels increase. Activity can be expressed using economic (e.g. value added) or physical (e.g. ton of product) indicators.




Contraction of Absolute Emissions: This approach assumes that all companies within the same level of disaggregation (i.e. sector, region or globally) reduce emissions at the same rate. The rate of contraction is purely a function of the overall reductions implied in the corresponding emissions scenario. For instance, the IPCC AR5's RCP2.6 scenario requires global emissions to come down by 66% between 2010 and 2050. Using this scenario, all companies would have to reduce their GHG emissions by this same amount, regardless of sector.




The challenge with intensity approaches is effective modeling of the denominator (e.g. dollars GDP) to ensure the carbon budget is not exceeded. An advantage of the absolute contraction approach is that such modelling is not required.

# Annex 2. Overview of available SBT methods

The methods described in this manual are free and publicly available, and applicable to multiple sectors. This chapter characterizes each method with respect to a set of key descriptors.

**Key Insights in This Chapter**

- SBT methods vary in the emissions scenario and allocation mechanism used, conditions under which the carbon budget is maintained, extent to which supporting technical documentation is available, and types of target output.
- It is expected that new scenarios and methods will be developed for a range of specific sectors. Information on these will be posted to the SBT initiative's website as the methods are made publicly available and/or validated by the SBT initiative.

## A2.1 Method Descriptions

The following methods are described in this chapter in sequence:

- Absolute emissions contraction
- Sectoral Decarbonization Approach (SDA)
- Greenhouse Gas Emissions per Value Added (GEVA)
- Climate Stabilization Intensity Targets (CSI)
- Context-based Carbon Metric (CSO)
- Corporate Finance Approach to Climate-stabilizing Targets (C-FACT)

Each method is described with respect to eight factors, detailed below. Table A2-1 summarizes the methods.

1. Emissions scenarios. Emissions scenarios are described in terms of their:
   - Identity: the emission scenario used and the extent to which that scenario is up-to-date.
   - Coverage: including the GHGs considered (only $CO_2$ or both $CO_2$ and other GHGs) and the sectors or activities considered (e.g., energy sectors, land use change, or agriculture emissions).
   - Granularity: whether the scenario is an aggregated global scenario, a global scenario with sectoral disaggregation, or a global scenario with regional and sectoral disaggregation.
   - Assumptions: the stringency of the scenario and its suitability for setting SBTs.
   - Data: whether data on the scenario are publicly available, including just the emissions data or also other variables that are either projected or used as input for the scenario (e.g. GDP growth, electricity production, cement production, etc.). The latter may be needed to use certain methods and can provide further transparency as to scenario assumptions.
2. Allocation mechanism: whether a method uses contraction or convergence, and of absolute emissions, physical emissions intensity or economic intensity.
3. Carbon budget: the extent to which companies' use of the method maintains the carbon budget and what mechanisms are used to ensure this.
4. Validation: the extent to which the method been validated (or is capable of being validated). For example, has the method been published in peer-reviewed scientific journals? Otherwise, is clear documentation available on the method, including on underlying principles and a mathematical

formulation of the method; and has the method been reviewed by external expert panels or via public consultation?

5. Usability: whether a calculation tool is available and any known plans for updating the method.
6. Targets: including whether absolute and/or intensity targets are output, the range of permissible base years and target years, the pathway connecting base years and target years (none, linear, as per emissions scenario, or compound annual growth rate (CAGR)), and applicability to different scopes.
7. Miscellaneous notes

**Absolute Emissions Contraction**

Scenario: Generally proposed with AR5 range of scenario results, requiring 49-72% reduction from 2010 to 2050, but any suitable scenario can be used. However, the use of certain scenarios requires less emissions reduction up-front, necessitating that more emissions are captured and stored in the future - delaying action and creating a "carbon debt" for future generations. The SBT initiative encourages companies, particularly those in developed countries, to adopt 72% reduction to be more likely to avoid the future carbon debt issue and adjust for other potential influences on the global carbon budget.

Allocation: Contraction of absolute GHG emissions. Because this method requires all companies to reduce their emissions at the same rate, new or growing businesses might find it difficult to it to get to their "fair share" of the carbon budget during the transition to a low carbon economy.

Budget: Budget is maintained, as all companies reduce in line with scenario, provided no new businesses are created. As that is not a reasonable assumption, the scenario predictions should be reviewed periodically (5 to 10 years) and targets adjusted accordingly in order to maintain the emissions budget.

Validation: Faria and Labutong (2015) provide a mathematic expression for this method.

Usability: The method is easy to use and follow. No supporting documentation exists so far on this method. No updates envisaged.

Targets: Absolute emission reductions, with pathways that are linear, CAGR or mirror the scenario pathway. Base year and target year can be specified according to scenario. Method can be used for any scope, provided suitable scenarios exist.

Notes: This method has been identified by the SBT initiative as a simple, straightforward approach to set and track progress toward targets.

**Sectoral Decarbonization Approach (SDA)**

Scenario: The method uses the 2DS scenario developed by the IEA (IEA 2016), which is compatible with the RCP2.6 scenario. The 2DS scenario comprises an emissions scenario and an activity scenario, which are used to compute sectoral intensity pathways. Reference data for IEA ETP scenarios are publicly available (IEA 2016).

Allocation: Two allocation principles are used: physical intensity convergence, for homogeneous sectors; and contraction of absolute emissions, for heterogeneous sectors.

Budget: Each sectoral budget is maintained, to the extent the sum of sectoral activity does not go beyond that projected for the scenario (for homogeneous sectors) and that no new businesses are created (for the heterogeneous "Other Industry" sector). Periodic revision of the scenarios and of

targets is recommended, to incorporate new information related to historical emissions, technological developments and the necessary reduction efforts by sector.

Validation: Published in peer review journal (Krabbe et al. 2015). A description of the method and most of the scenarios used has also been published (CDP et al. 2015). The method is mathematically formulated and publicly available. It was developed through a stakeholder process, including review by a Technical Advisory Group and a public open comment period.

Usability: The method is more complex than other existing methods to the extent that it requires physical data that might not be publicly available (but should exist in companies) and it uses a sector/activity approach which might require companies to set multiple targets. It is more oriented to energy and carbon intensive industries, although for non-carbon intensive it falls back to an absolute emissions contraction method. A tool is available, which will be periodically updated[xxviii].

Targets: Absolute or intensity (physical or value added, depending on sector) targets. Allows different base years starting from 2010 and different target years up to 2050. Target pathways follow the contour of the sector scenario pathway. Requires companies to gather both emissions and activity data and to forecast activity. Covers scopes 1 and 2, with distinct targets for both. "Product Use" for Light road vehicles manufacturing is the only scope 3 sector in the tool.

Notes: The method takes sectoral differences and abatement potentials into account, to the extent these are considered in the making of the different sector scenarios. It also has defined specific scope 2 scenarios, which better translate into corporate GHG accounting practices, and it can be used to set valid scope 3 targets for certain scope 3 categories (see Chapter 4.3). For homogeneous sectors, it also accommodates the issue of historical action, as it requires GHG emissions intensive companies to reduce their emissions faster. New companies in homogeneous sectors can also be accommodated and allocated portions of the budget. As it currently stands, the method does not cover several activity sectors (Agriculture, forestry, and other land use; Oil and gas production; Residential buildings).

**Greenhouse Gas Emissions per Value Added (GEVA)**

Scenario: The original scenario uses 50% reduction by 2050 (IPCC Fourth Assessment Report) and economic growth of 3% p.a., but can be used with different scenarios.

Allocation: Contraction of GHG intensity per value added.

Budget: Budget is maintained to the extent that the growth in value added of companies is equal to or smaller than the projection used to calculate the intensity target.

Validation: Described in Randers (2012). Faria and Labutong (2015) provide a mathematic expression of this method.

Usability: The method is easy to use and follow. Documentation is only available for other methods based on GEVA (see CSI, CSO and C-FACT method). Tools are available that implement variations of these methods (see CSO and C-FACT). Only requires tracking of emissions and value added to set and track target. No updates envisaged.

Targets: Intensity targets in the form of $tCO_2e$/$ value added. Base year and target year can be specified according to scenario. Targets follow a CAGR trajectory to target year. Method is intended for scope 1 emissions.

Notes: The GEVA method forms the basis of several other methods that base allocation on value added. There are different ways of constructing the allocation of emissions based on value added, as

well as different scenarios that can be used to form the basis of the allocation. These will cause some degree of variation in the final results from GEVA and related methods.

**Climate Stabilization Intensity Targets (CSI)**

Scenario: IPCC Fourth Assessment Report. 80% reduction in GHG emissions by 2050, from a 2007 base year. Economic growth of 5.9% per annum (current prices) from 2007 to 2050.

Allocation: Contraction of GHG intensity per value added.

Budget: See comments for GEVA.

Validation: Based on GEVA, which has been peer reviewed and published in a scientific journal. This application has been documented by Tuppen (2009). No detailed general mathematical formulation of the method beyond value added definition and GHG intensity per value added.

Usability: The method is easy to use and follow and is documented. No tool is available. Only requires tracking of emissions and value added to set and track target. No updates envisaged.

Targets: Intensity targets in the form of $tCO_2e$/$ value added. Base year and target year can be specified according to scenario. Targets follow a CAGR trajectory to target year. Method aggregates scope 1+2 and does not cover scope 3.

Notes: CSI is a specification of GEVA to the case of a particular company (BT) using a particular scenario (described above). This results in a long-term target prescribing a reduction in scope 1+2 GHG intensity ($tCO_2e$/million GDP) of 9.6% p.a. for companies in developed countries. It follows the principle that all companies within a given geography (in this case, developed countries) will decrease their GHG intensity per value added at the same rate.

**Context-based Carbon Metric (CSO)**

Scenario: Multiple scenarios can be used with this method that can lead to method covering different geographies, target years or sectors.

Allocation: Contraction of GHG intensity per value added.

Budget: See comments for GEVA.

Validation: Based on GEVA, which has been peer reviewed and published in a scientific journal. No general mathematical formulation of the method publicly available. Updated as needed by the Center for Sustainable Organizations (CSO).

Usability: Documentation is available (McElroy 2017). A tool is available, specifying the method for one scenario (SSP1-2.6)[xxix]. Only requires tracking of emissions and value added to set and track target. The tool can be used also for target tracking by the company.

Targets: Intensity targets in the form of $tCO_2e$/$ value added (per the implementation available online). Base year and target year can be specified according to scenario. Targets follow a CAGR trajectory to target year. Deals with scope 1 and 2 targets, and, optionally, scope 3 targets.

Notes: Originally developed and piloted for the setting of Ben & Jerry´s targets in 2006 (current version, v5.5 was released in 2015). Performance is reported annually and cumulatively in three ways: intensity, absolute, and "context-based" (a rating evaluating the ratio of actual emissions to targeted emissions). Method is flexible and can accommodate variations in emissions scenario and intensity metric.

**Corporate Finance Approach to Climate-stabilizing Targets (C-FACT)**

Scenario: IPCC Fourth Assessment Report. For developed countries: 85% reduction in GHG emissions by 2050 compared with 2007 base year; for developing countries: 50% reduction in GHG emissions by 2050. Companies specify their own future value added projection (based on contribution to GDP). As with previous tools, different scenarios can be accommodated.

Allocation: Contraction of absolute emissions, although targets also communicated as intensity (value added) targets.

Budget: Budget is maintained to the extent growth of companies is equal to or is smaller than their projection used in the scenario. Companies have reductions similar to that of the scenario.

Validation: Not published in peer reviewed journal, but a description of method is available Faria and Labutong (2015) provide a mathematic expression of this method. Developed by Autodesk in consultation with the U.S. Environmental Protection Agency (EPA), the Climate Group, WRI, and ClearCarbon (now Deloitte).

Usability: The method is easy to use and follow. Documentation is available (Stewart and Deodhar 2009). A tool is available that allows setting targets for companies in developed countries and that can easily be specified for developing countries. Only requires tracking of emissions and value added to set and track target.

Targets: Intensity target in the form of $tCO_2e$/$ value added based on contraction of absolute emissions. Base year and target year can be specified according to scenario. Targets follow a CAGR trajectory to target year. Method proposes coverage of scope 1, 2, and 3 emissions.

Notes: The method has a five-year sliding window companies can use to evaluate overall short-term progress towards the target. The method projects an absolute emissions reduction target, upon which the intensity target is constructed based on the growth projection of company. Method proposes that companies track their intensity target.

**Table A2-1.** Summary of SBT Methods

| Information | Absolute Emissions Contraction | CSI | Context-Based Metric (CSO) | C-FACT | GEVA | SDA |
|---|---|---|---|---|---|---|
| **Base Year** | Flexible | Flexible | 2005 | Flexible, prefers 2009 | Flexible, prefers 2010 | Flexible, from 2010 onward |
| **Target Year** | Flexible | Flexible through 2050 | Flexible through 2050 | Flexible through 2050 | Flexible through 2050 | Flexible through 2050 |
| **Emissions scenario** | Flexible | Flexible, although IPCC Fourth Assessment Report used in current implementation | Flexible | Flexible, although IPCC Fourth Assessment Report used in current implementation | | IEA 2DS |
| **Level of sector differentiation** | None | None | None | None | None | Sectoral |
| **Allocation Mechanism** | Contraction (absolute) | Contraction (intensity) | Contraction (intensity) | Contraction (absolute) | Contraction (intensity) | Convergence (for homogeneous sectors)<br><br>Contraction (for heterogeneous sectors) |

| Information | | Absolute Emissions Contraction | CSI | Context-Based Metric (CSO) | | C-FACT | GEVA | SDA |
|---|---|---|---|---|---|---|---|---|
| **Input Data** | Base year | • Absolute emissions, scope 1+2+3 if desired | • Combined scope 1 and 2 intensity<br>• Gross profit | • Scope 1 and 2 absolute and intensity emissions (separately)<br>• Gross profit, revenue, physical activity | • Absolute scope 1, scope 2, or scope 1+2+3 if desired<br>• Gross profit, revenue | • Either intensity or absolute scope 1, scope 2, or scope 1+2<br>• Gross profit | | • Scope 1 and 2 absolute emissions (separately)<br>• Physical activity; gross profit |
| | Target year | • Growth projection (specified by method scenario) | • Growth projection (as projected by company)<br>• Gross profit/margin | • Growth projection (as projected by company)<br>• Gross profit/margin target (as determined by company) | • Growth projection (as projected by company)<br>• Gross profit/margin target | • Growth Projection (specified by method scenario) | | • Growth projection (as projected by company and only for homogeneous sectors) |
| **Target Year Outputs** | | Absolute reduction, scope 1+2+3 if desired | Combined scope 1 and 2 intensity | Scope 1 and 2 absolute and intensity emissions (separately) | | Presents intensity and absolute reductions | Intensity target or absolute target | Scope 1 and 2 absolute emissions and intensity (separately) |

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# About the partner organizations in the Science Based Target initiative

CDP

CDP is an international not-for-profit organization providing the only global system for companies and cities to measure, disclose, manage, and share vital environmental information. These insights enable investors, companies, and governments to mitigate risks from the use of energy and natural resources, and to identify opportunities from taking a responsible approach to the environment. (https://www.cdp.net)

UN Global Compact:

The UN Global Compact believes it's possible to create a sustainable and inclusive global economy that delivers lasting benefits to people, communities and markets. To make this happen, the UN Global Compact supports companies to: do business responsibly by aligning their strategies and operations with Ten Principles on human rights, labor, environment and anti-corruption; and take strategic actions to advance broader societal goals, such as the forthcoming UN Sustainable Development Goals, with an emphasis on collaboration and innovation. (www.unglobalcompact.org)

World Resources Institute (WRI)

WRI focuses on the intersection of the environment and socioeconomic development. We go beyond research to put ideas into action, working globally with governments, business, and civil society to build transformative solutions that protect the earth and improve people's lives. (www.wri.org)

WWF

WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption. (http://wwf.panda.org)

# Endnotes

[i] The IPCC is a scientific and intergovernmental body established under the auspices of the United Nations "to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts." https://www.ipcc.ch/.

[ii] The range of values for the percent decrease in emissions is due to uncertainty in emissions modeling projections. The values are taken from a specific pathway (Overshoot < 0.4 W/m2) detailed on p431 of Clarke et al (2014).

[iii] Some methods for setting SBTs can be adapted to meet more stringent temperature targets. See Annex 2 for more details.

[iv] The LCPTi is a collaboration between WBCSD (World Business Council for Sustainable Development), SDSN (Sustainable Development Solutions Network) and IEA (International Energy Agency) that presents a series of concrete action plans on nine sectors for the large-scale development and deployment of low-carbon technologies. http://lctpi.wbcsdservers.org/.

[v] For more information on P&G's wind farm, see http://cdn.pg.com/en-us/-/media/PGCOMUS/Documents/PDF/Sustanability_PDF/sustainability_reports/PG2015SustainabilityReport.pdf?la=en-US&v=1-201605111505.

[vi] For more information on Dell's SBT, see http://sciencebasedtargets.org/case-studies/case-study-dell/.

[vii] For more information on Kellogg's SBT, see http://sciencebasedtargets.org/case-studies/case-study-kellogg/

[viii] To read the full statement, see http://investorsonclimatechange.org/portfolio/global-investor-statement-climate-change/.

[ix] For more information on NRG Energy's SBT, see http://sciencebasedtargets.org/case-studies/case-study-nrg/.

[x] For more information on Land Securities' SBT, see http://sciencebasedtargets.org/case-studies/case-study-land-securities/.

[xi] For more information on Coca-Cola Enterprises' SBT, see http://sciencebasedtargets.org/case-studies/case-study-coca-cola-enterprises/.

[xii] The IEA "examines the full spectrum of energy issues and advocates policies that will enhance the reliability, affordability and sustainability of energy in its 29 member countries and beyond." http://www.iea.org/about/.

[xiii] Another method uses the contraction of absolute emissions approach – the "3% Solution": http://www.worldwildlife.org/projects/the-3-solution. This manual does not recommend the 3% Solution because it calculates targets only through 2020. As described in the manual, companies should set target years that are between five and fifteen years out from the current year.

[xiv] For the current list of the SBT initiative's criteria and recommendations, see http://sciencebasedtargets.org/wp-content/uploads/2017/02/SBTi-criteria.pdf

[xv] For more information on Thalys' target, see http://sciencebasedtargets.org/case-studies/case-study-thalys/.

[xvi] These criteria are explained in Chapter 7 of the GHG Protocol Scope 2 Guidance.

[xvii] The Science Based Target initiative's Call to Action campaign requires that all electricity-generating companies that distribute natural gas or other fossil fuel products set scope 3 targets for the use of sold products.

[xviii] To determine whether the cumulative impact of such changes warrants recalculations, companies should adopt a significance threshold. The GHG Protocol does not specify a threshold value, although a

5 percent value is generally recommended. Using a 5 percent threshold, changes would be considered significant if, in the aggregate, they affect the SBT by more than 5 percent. Once defined, a significance threshold should be applied consistently over time.

[xix] For more information on Pfizer's SBT, see http://sciencebasedtargets.org/case-studies/case-study-pfizer/.

[xx] The EPA calculator translates emissions data into estimates of the annual emissions from cars, households, and power plants. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

[xxi] For the GRI standards on sustainability reporting, see https://www.globalreporting.org/standards/.

[xxii] In addition to collecting emissions data, the CDP Climate Change Questionnaire collects information on corporate risks and opportunities connected to climate change. https://www.cdp.net/en/climate.

[xxiii] The NAZCA platform currently reports the commitments of at least two thousand companies. http://climateaction.unfccc.int/.

[xxiv] The mass of $CO_2$ can be estimated by multiplying the mass of carbon by the ratio of the molecular weight of $CO_2$ to that of carbon. This ratio is 44/12 or about 3.67.

[xxv] The third and fourth assessment reports of the IPCC assess GHG concentrations rather than temperature thresholds.

[xxvi] Because GHGs can have a multi-year lifespan and accumulate in the atmosphere, the radiative forcing levels in RCP2.6 also follow a "peak and decline" pathway, but one in which forcing levels peak at around 3.1 W/m2 by mid-century, and return to 2.6 W/m2 by 2100 (Clarke et al. 2014).

[xxvii] For a discussion of instruments and agreements for international climate cooperation, see Stavins et al. (2014).

[xxviii] The SDA and supporting documentation can be downloaded from http://sciencebasedtargets.org/sda-tool/.

[xxix] The CSO tool can be downloaded from http://www.sustainableorganizations.org/context-based-metrics-in-public-domain.html.