

# Demonstrating net zero: The next generation of science-based targets for industry decarbonization

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## Abstract

Net zero presents a challenge and opportunity for the industrial sector, which has seen emissions growth over the past couple decades. The emissions intensiveness of industrial production combines with policy insularity and established vested interests to create an orientation toward status quo approaches. On the other hand, new company targets and emerging technologies create opportunities for industrial sector low-emissions transformation. This paper outlines the components of net-zero, science-based targets for industry that will play a central role in achieving climate stabilization.

## Introduction

Since the publication of the Intergovernmental Panel on Climate Change (IPCC) Special Report on 1.5 °C in 2018, net-zero has become the foremost framing for climate ambition. The IPCC report defines net-zero CO<sub>2</sub> as the state at which “anthropogenic CO<sub>2</sub> emissions are balanced globally by anthropogenic CO<sub>2</sub> removals over a specified period” (IPCC, 2018). For net zero to lead to climate stabilization, definitions and standards must be specified for a range of stakeholders including heavy industry. This paper focuses on the challenges of net-zero for industry and how they are being addressed by leading initiatives.

The November 2021 COP26 meetings introduced new platforms for net-zero targets and goals, widespread participation

by financial institutions, and a renewed focus on market-based mechanisms for climate. Companies, financial institutions, countries, and cities have embraced net-zero to the extent that more than 80 % of global GHG emissions were covered by some form of net-zero target formulation as of November 2021 (Hale, et al. 2021). At COP26, the financial sector’s push toward net-zero was epitomized by the Glasgow Financial Alliance for Net Zero (GFANZ), a self-described “global coalition of leading financial institutions committed to accelerating the decarbonization of the economy”. Many of the largest private financial institutions joined GFANZ, bringing its membership to more than 450 financial firms across 45 countries responsible for assets of over \$130 trillion. Beyond net-zero targets and financial participation, market-based mechanisms arose as a central component of the climate mitigation conversation via the Taskforce on Voluntary Carbon Markets and the Article 6 Playbook covering cooperative approaches between countries wishing to trade Internationally Transferred Mitigation Outcomes.<sup>1</sup> COP 26 reflected a focus of mitigation action within the private sector rather than government policies or updated Nationally Determined Contributions (NDCs).

These developments created opportunities and challenges for industrial companies seeking to reduce their emissions and support climate stabilization. While financial institutions’ commitment to Paris alignment and net zero can facilitate investment in capital-intensive industrial climate mitigation technologies, the prospect of purchasing carbon credits to offset

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1. Article 6 originated in the 2015 Paris Agreement; it is intended to create a new carbon crediting mechanism to replace the Clean Development Mechanism from the Kyoto Protocol.

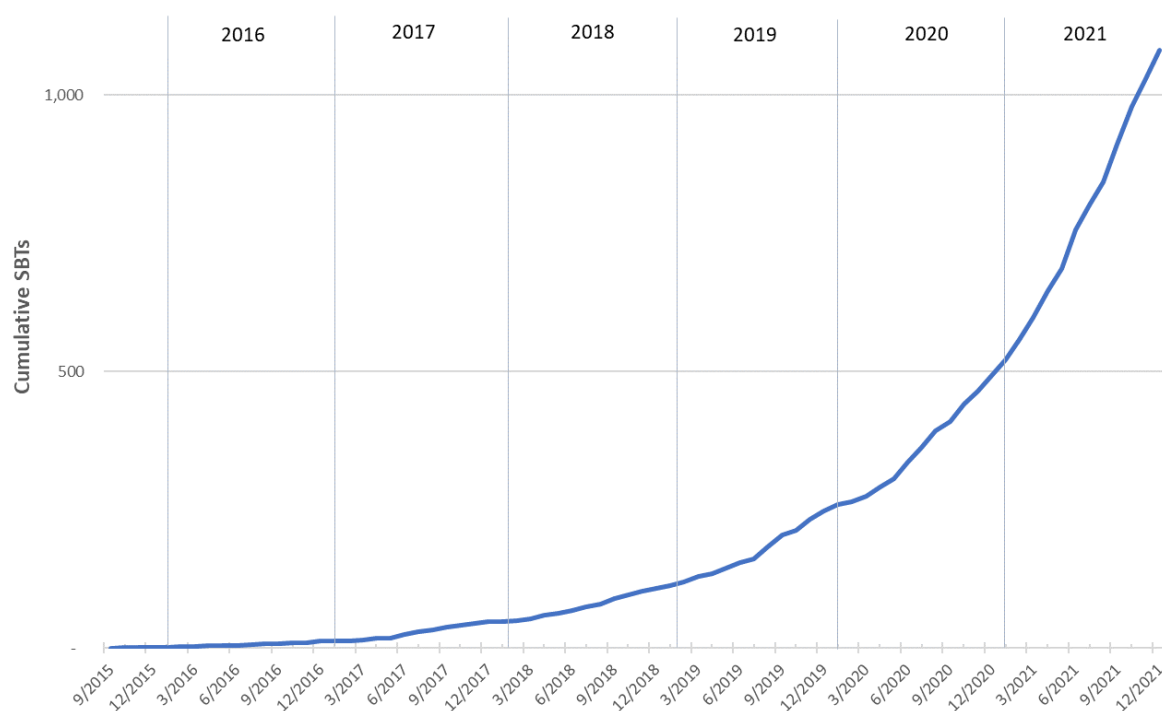


Figure 1. Company and Financial Institution Science-Based Targets Approved by the SBTi (2015–2021).

Source: Science Based Targets initiative (<https://sciencebasedtargets.org/companies-taking-action/>); note that in addition to the approved near-term SBTs displayed above, 1,280 other companies and financial institutions have publicly committed to setting SBTs, bringing the total number of approved and committed SBTs to more than 2,400 as of January 2022.

status quo emissions can also undermine industrial companies' mitigation ambition. To ensure consistency, transparency, and climate alignment, the Science Based Targets initiative (SBTi) launched a Net-Zero Corporate Standard in 2021. SBTi is a collaboration between CDP, the UN Global Compact, WRI, and WWF, that has independently assessed company and financial institution targets since 2015. Figure 1 below illustrates the exponential growth of SBTs from one in October 2015 to more than 1,100 in January 2022.

A broad range of companies and financial institutions have had their science-based targets approved by SBTi. When companies submit their targets to SBTi, they classify themselves into one of 54 sectors using a bespoke SBTi taxonomy. Within industry, this analysis is focused on the steel, cement, and chemicals sectors. As of January 2022, companies with SBTi-approved science-based targets included 11 from the steel sector, 20 from the cement sector, and 21 from the chemicals sector.<sup>2</sup> Companies with approved science-based targets have met SBTi criteria and successfully completed the target validation process.<sup>3</sup> Building on Greenhouse Gas Protocol emissions

accounting, the SBTi has created a new platform for climate collaboration through its requirement that companies and financial institutions quantify and address their scope 3 (value chain) emissions.<sup>4</sup>

This paper explores the meaning and implementation of net zero for the industrial sector. The next section on the Foundations of Net Zero reviews the climate science and the definition of net zero developed by the Science Based Targets initiative in its 2021 Net-Zero Corporate Standard. The third section on Industrial Approaches to Net Zero examines cumulative emissions budgets before assessing current emissions scenarios and targets for steel, cement, and chemicals companies. Finally, the paper concludes with an Agenda for Further Research.

## Foundations of Net Zero

### MAKING NET-ZERO WORK AS A CLIMATE GOAL

At the global level, net-zero is a state of balance between human-caused greenhouse gas (GHG) emissions and removals on an annual basis. When net-zero is reached, atmospheric GHG concentrations will cease to increase, which is a precondition for climate stabilization (but not a guarantee due to climate feedbacks). By contrast, cumulative emissions control the *level*

2. These numbers may include related companies. The CDP-derived sector classifications are "mining- iron, aluminum, other metals", "construction materials", and "chemicals". For the full list of companies with targets and commitments, see <https://sciencebasedtargets.org/companies-taking-action/>

3. SBTi criteria (<https://sciencebasedtargets.org/resources/files/SBTi-criteria.pdf>) are an annually updated list of more than 30 target requirements and recommendations that serve as the basis of the target-validation protocol (<https://sciencebasedtargets.org/resources/files/Target-Validation-Protocol.pdf>).

4. See WRI and WBCSD, 2004 and 2011. Establishing scope 3 emissions assessment and target setting as a norm is a central achievement of the SBTi that is engaging industrial companies through their value chains.

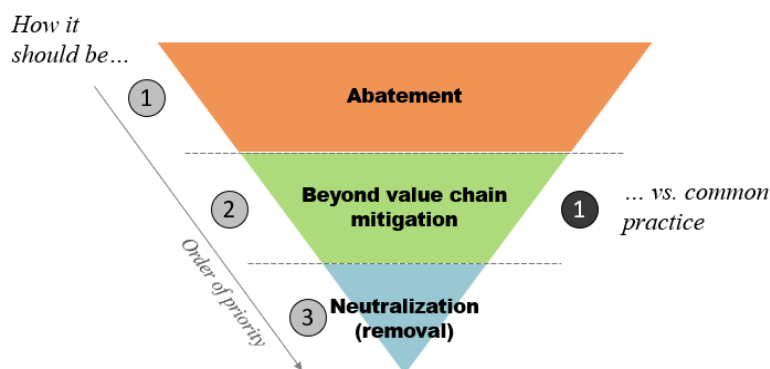


Figure 2. Simple representation of the mitigation hierarchy vs. common practice.

Note: Carbon credits used for offsetting are an example of beyond value chain mitigation.

of climate stabilization that can be expected when net-zero is reached. Higher cumulative emissions lead to more warming and a greater likelihood of exceeding climate feedback “tipping points” than lower cumulative emissions (Lenton et al. 2019). For these reasons, it is imperative to link net-zero with cumulative emissions budgets and associated climate goals.

Indeed, this is the approach taken in the Paris Agreement, which calls for “Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels” in Article 2 and “achiev[ing] a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century” in Article 4. The SBTi’s framework for corporate net-zero targets aims to limit temperature increase to 1.5 °C above pre-industrial levels and reach net-zero at the global level by mid-century (SBTi 2020). To systematize these goals, the framework follows a “mitigation hierarchy” approach whereby actions to reduce or eliminate business-relevant emissions (i.e., abatement) are the first priority; actions to accelerate mitigation beyond the company’s value chain are a second priority; and actions to neutralize business-relevant emissions with permanent CO<sub>2</sub> removal are phased-in as a third priority, as society gets closer to net-zero (Figure 2). Among businesses, the importance of abatement and neutralization is often overlooked (Day et al. 2020).

#### DETERMINING 1.5°C PATHWAYS

The SBTi uses climate mitigation pathways to steer abatement. Both sector-specific and cross-sector pathways are used to calculate the minimum ambition and timing of emissions targets for different types of companies. Pathways are determined based on a combination of science and principled judgements: the key scientific inputs are estimates of the remaining carbon budget and a comparative assessment of top-down mitigation scenarios and sectoral studies; key judgements include the choice of carbon budget (e.g., 50 % or 66 % chance of limiting warming to 1.5°C), permissible budget overshoot, non-CO<sub>2</sub> GHG pathway coverage, and the approach to burden-sharing across sectors (SBTi 2021c). These judgements are informed by an understanding of the synergies and trade-offs between different climate change mitigation pathways and sustainable development.

In aggregate, 1.5 °C -aligned pathways used by the SBTi stay within the remaining budget to limit global warming to 1.5 °C with a 50 % probability (about 500 GT CO<sub>2</sub>). In other words, these pathways have at least a 50% chance of not overshooting the 1.5 °C budget. By contrast to overshoot scenarios, which may temporarily exceed this carbon budget, pathways used by the SBTi substantially reduce mitigation barriers and climate risk.

Next, the global CO<sub>2</sub> budget is disaggregated to sector-specific budget ranges. These budget ranges allow different sectors to use a diverse range of modelled pathways, while ensuring that the global carbon budget is not exceeded. To define the upper bound of sectoral carbon budgets, we use the IEA’s Net-Zero Scenario and Roe et al. (2019), ‘Contribution of the land sector to a 1.5 °C world.’ These studies have undergone rigorous peer review, incorporate detailed sectoral considerations, utilize historical data, and were designed for consistency with the UN Sustainable Development Goals. The SBTi estimated a lower bound on 1.5 °C -aligned sectoral budgets based on a review of other relevant studies—especially the Low Energy Demand (P1) scenario (Grubler et al. 2017) and the One Earth Climate Model 1.5 °C scenario (Teske et al 2020).

Sector-specific pathways consistent with these budget ranges are being developed under the SBTi’s sector development process, which fosters stakeholder collaboration through convening an expert advisory group and inviting feedback through public consultations. A cross-sector pathway is also maintained by the SBTi. Non-CO<sub>2</sub> GHGs are added into relevant pathways based on a similar research-driven process.

These pathways underscore the importance of the mitigation hierarchy: to align with the 1.5 °C goal, every sector needs to step up mitigation efforts, and emissions reductions should only be fungible when they go *beyond* the minimum science-based pathway required from each sector acting in parallel.

#### FORMULATING BUSINESS NET-ZERO TARGETS

Under the SBTi’s Net-Zero Standard, net-zero targets cover the entire business and demonstrate what’s needed for companies to align with net-zero at the sector or global level and the 1.5 °C goal. The SBTi requires net-zero targets to be supported by near-term and long-term SBTs focused entirely on emissions reductions in the company’s organizational boundary (scopes 1 and 2) and value chain (scope 3). Near-term SBTs are calculated

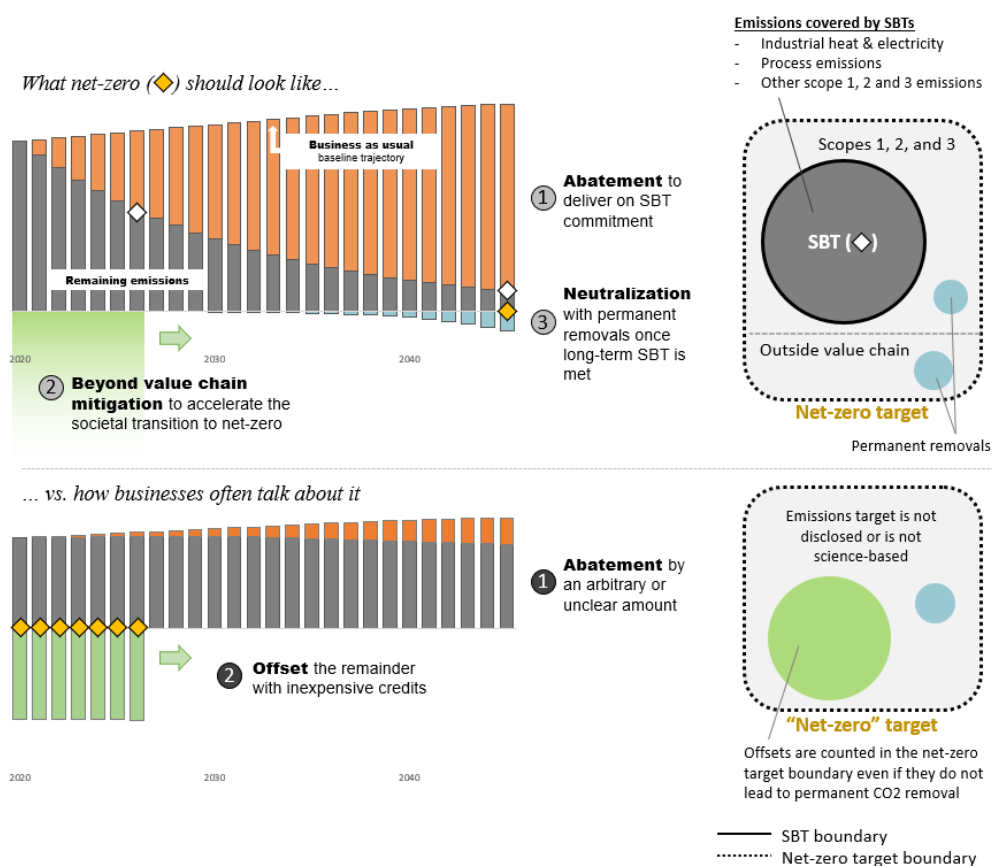


Figure 3. Overview of the SBTi's approach to net-zero vs. common practice.

based on the rate of emissions or emissions intensity reductions needed based on 1.5 °C pathways. Long-term SBTs are calculated based on 2020–2050 emissions reductions or 2050 sector-specific emissions intensity averages. For industry sectors, these long-term SBTs are consistent with emissions reductions of around 90 % or more before counting carbon credits or dedicated removals. When long-term SBTs are met, the net-zero target can also be achieved through further emissions reductions in scopes 1, 2 or 3, or dedicated removals like direct air capture or bioenergy, carbon capture, and storage (BECCS).

This net-zero target formulation differs from some pre-existing corporate practices (Figure 3). Many companies have set net-zero targets that are more limited in scope, more lenient with respect to offsets, and, in some cases, unsupported by near-term targets. These issues have rightfully provoked skepticism. The SBTi's Net-Zero Standard aims to resolve these issues and ensure that net-zero is used to drive impact. Despite the newness and apparent stringency of the SBTi's approach, eight companies have already had net-zero targets validated and more than 800 companies have committed to setting science-based net-zero targets following SBTi rules as of April, 2022 ("Companies Taking Action" 2022).

#### THE JOURNEY TO NET ZERO

The SBTi's Net-Zero Standard also derives impact from having undergone an intensive multi-stakeholder development process. In 2019, the SBTi initiated a scoping phase of work, which included public consultation to resolve several high-im-

pact questions: for example, the end-of-century climate goal of the standard and the principles that would underlie the standard. There were more than 500 webinar participants in this first public consultation and more than 80 respondents to a follow-up survey (SBTi 2020). Survey responses to the SBTi were analyzed and published in aggregate in an Annex to "Foundations of Net-Zero Target Setting in the Corporate Sector." More than 95 % of the respondents agreed that Net-Zero Targets should be consistent with the 1.5 °C climate goal.

The development phase of work ran from October 2020 to October 2021. For this phase of work, the SBTi convened an Expert Advisory Group with representatives from NGOs, academia, and business to serve as the main consensus-building body for the Standard. More than 500 written responses were received in this phase of work, which included two more public consultations and a road test with several dozen companies (SBTi 2021a). For the first and most widely attended of these consultations, the SBTi conducted qualitative and quantitative feedback analyses for 11 distinct stakeholder groups: six business sectors (built environment, chemicals, energy, industry, land-intensive, other, and transportation), finance, academia, consulting, and non-profit (SBTi 2021e). For some questions, feedback was relatively consistent across stakeholder groups but for others, there were significant differences. For example, business sector respondents preferred 5–15 year targets, whereas finance, academic, and non-profit respondents preferred 5–10 year targets. Feedback from this consultation was used by the SBTi to inform key decisions including target timeframe,

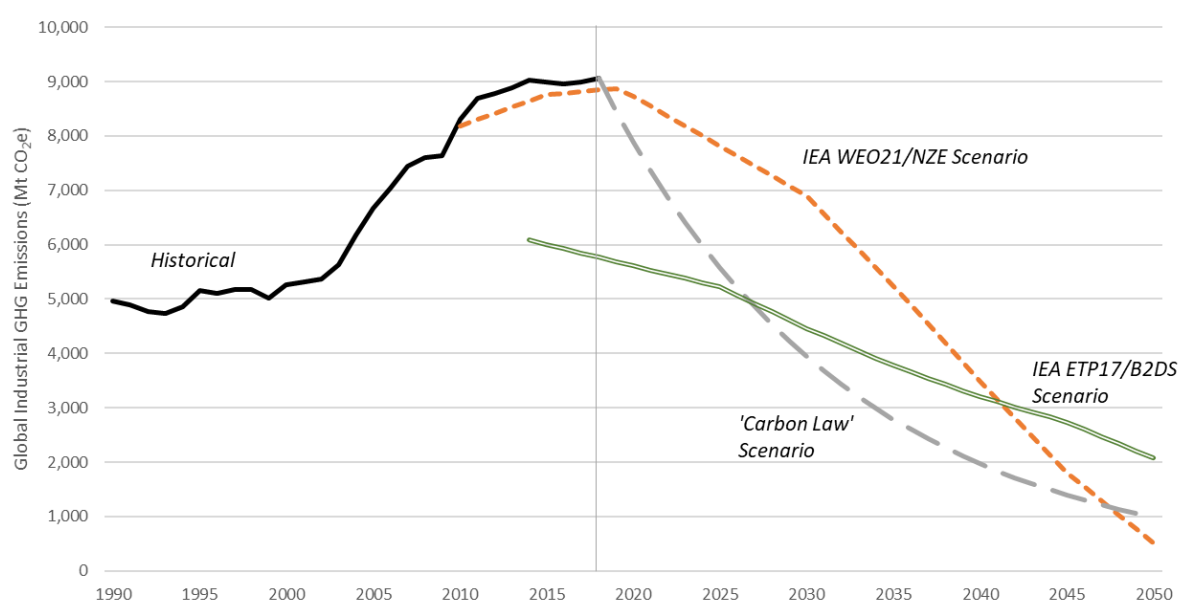


Figure 4. Annual Industrial Sector Direct Emissions, 1990-2050.

Sources: Climate Watch (WRI), IEA (2017), IEA (2021), Rockstrom (2017).

ambition, and boundary, as well as neutralization and beyond value chain mitigation, with changes transparently documented in the SBTi's public consultation feedback report. Feedback from the road test and final public consultation were also analyzed, used to inform changes, and published (SBTi 2021f-g).

We feel that a novel feature of SBTi frameworks is that they set a commonly agreed-upon destination for corporate targets grounded in sector-based implementation rather than market instruments. Targets under the Net-Zero Standard are often viewed as rigorous, but many stakeholders agree that they are crucial to society. Whereas in the past, companies have set weaker goals due to fear of economic disadvantage or lack of real-world impact, now companies are prompted to act as part of a unified movement.

Moreover, an important outcome of this work is the distinction between neutralization, which requires near-permanent CO<sub>2</sub> removal, and the more expansive class of actions referred to as beyond value chain mitigation. This outcome bears similarities to, and was partly informed by, The Oxford Principles for Net Zero Aligned Carbon Offsetting ("Oxford Principles" 2020).

#### COMPARING THE SBTI WITH OTHER INITIATIVES

Other leading initiatives have adopted similar approaches to allocate global climate goals across different sectors and companies. The Net-Zero Asset Owners Alliance (AOA), a United Nations-convened membership initiative that aims to transition investment portfolios to net-zero GHG emissions by 2050, steers financial institutions to halve emissions between 2020 and 2030 (UN AOA 2022). The AOA has commissioned sector-based pathways consistent with the 1.5 °C goal from the One Earth Climate Model. The Transition Pathways Initiative (TPI), also led by asset owners, evaluates corporate "readiness for the low-carbon transition" by comparison to emissions intensity pathways published in the IEA Energy Transition Pathways reports (TPI 2019). The Mission Possible Partnership, a business organization that aims to "trigger a net-zero

transformation of seven industrial sectors," has developed its own industry sector emissions pathways intended to align with specific climate goals, which are used to steer business climate strategy and investments that affect each business rather than relying primarily on offsets ("MPP – About").

While these initiatives are similar in several important ways as described above, they differ in terms of mitigation pathway usage, target-setting methods, and target boundary requirements. Whereas the AOA, TPI, and MPP derive pathways from a single model each, the SBTi examines a range of different pathways in each sector project. While both the AOA and the SBTi aim to cover the land sector, as well as energy and industrial sectors, TPI and MPP offer more limited sectoral coverage. The different initiatives have also made varying judgements on choice of carbon budget and overshoot allowance. In some cases, the variance across these initiatives offers complementary insights (for example, through the comparison of different sector pathways) but in other cases (such as global carbon budget), we feel that further harmonization at a high ambition level could be beneficial.

#### Industrial Approaches to Net Zero

The industrial sector is essential for achieving climate stabilization both in terms of emissions reductions and producing technologies that help to reduce emissions (Aden, 2017). Between 2000 and 2018, industrial sector emissions grew by 72 % and atmospheric concentrations of CO<sub>2</sub> increased by 11 %.<sup>5</sup> Figure 4 illustrates the growth of global industrial sector GHG emissions from 1990 to 2018 and emissions reductions indicated by three mitigation scenarios. Historically, global industri-

5. Emissions data cover energy- and process-related emissions and are sourced from Climate Watch (WRI). Atmospheric carbon data are from the NOAA observatory at Manu Loa (NOAA, 2022). Note that the relationship between industrial emissions and atmospheric concentrations is complicated by time lags, emissions sinks, and other emissions sources.

Table 1. Industrial Sector Direct Emissions Budgets (2020-2050).

	2020-2050 CO <sub>2</sub> Budget (Gt CO <sub>2</sub> )	2030 Annual CO <sub>2</sub> Emissions (Gt CO <sub>2</sub> )	2050 Annual CO <sub>2</sub> Emissions (Gt CO <sub>2</sub> )	2019-2050 Reduction
Industry	104 (CL) - 135 (LED) - 154 (WEO21/NZE)	3.9 (CL)– 6.9 (NZE)	0.52 (NZE) – 0.99 (CL)	88 (CL)-94% (NZE)
Iron and Steel	19 (OECM) - 31 (LED*) - 41 (WEO21/NZE) 56 (S12, MPP)	1.3 (CL) – 1.8 (NZE) 2.3 (S12, MPP)	0.22 (NZE) – 0.32 (CL) 0.34 (S12, MPP)	91% (NZE)
Cement	9 (OECM) - 42 (WEO21/NZE)	1.3 (CL) - 1.9 (NZE)	0.13 (NZE) – 0.32 (CL)	95% (NZE)
Chemicals	15 (CL) - 25 (WEO21/NZE)	0.58 (CL) - 1.2 (NZE)	0.066 (NZE) – 0.15 (CL)	94% (NZE)

Source: LED=Grubler et al. (2018), WEO21/NZE=IEA (2021), Rockstrom (2017), MPP (note that the MPP numbers include scope 1 and 2 emissions), OECM=OECM (2021).

LED\* = value judged to be consistent with the Low Energy Demand (LED) scenario based on the material demand assessment in Grubler et al. (2018) Supplementary Table 19.

al sector emissions began to grow more slowly well before the Covid-19 pandemic, fluctuating around 9 Gt CO<sub>2</sub>e after 2014. The dispersion across the three scenarios illustrates the lack of consensus around future industrial sector emissions needed for climate stabilization.

Within the broad range of companies and other stakeholders that comprise the industrial sector, the definition and implications of net zero are yet to be fully specified. There's no single 1.5 °C scenario that robustly covers net-zero emissions by 2050, but the IEA's Net Zero Emissions scenario provides the most recent, comprehensive, and granular resource for an integrated global industrial subsector emissions, production, and technology pathway. As illustrated in the figure above, the IEA's industrial sector emissions scenarios shifted significantly between the Energy Technology Perspectives Beyond 2 Degrees scenario in 2017 (represented by the hollow line) and the 2021 World Energy Outlook Net Zero Emissions scenario (represented by the higher dotted line). Much of this growth is likely due to the growth of industry emissions and the lag in updating models with historical data. The Carbon Law Scenario, whereby emissions are reduced by 6.7 % each year to achieve halving each decade, is represented by the long-dashed line with the exponential curve.

To control for varied inputs, model structures, and vintages, the SBTi has moved toward a 2020–2050 cumulative emissions budget approach to assess 1.5 °C scenarios for industry and other sectors (SBTi, 2021c). Table 1 shows the range of emissions budgets and annual emissions fluxes associated with current 1.5 °C scenarios.

Industrial subsectors need extensive near-term and long-term mitigation efforts to comply with 1.5° budgets; each sector faces unique mitigation challenges, demands, and opportunities that affect the size of its remaining budget (SBTi, 2021c).

Emissions pathways have also varied over time across steel, cement, chemicals, and total industry subsector groupings. Whereas the 2021 WEO/NZE scenario cumulative 2020–2050 carbon budget is 15 % lower than the ETP17 budget for cement, it is 30 % higher for steel. While there can be valid explanations for sector anomalies, the persistent variation underscores the need for scenario benchmarking of subsector cumulative emissions budgets.

The functional unit of the SBTi is individual companies. Companies use the GHG Protocol to develop base year emissions inventories of their scope 1, 2, and 3 emissions. The companies have varying levels of control over their activities, business models, investments, and production technologies. Companies' sensitivity to peer pressure and demand-linked expectations helps to account for the growth of SBTi and the emerging race-to-the-top dynamic among climate leaders. For industrial companies, the SBTi Net-Zero Standard requires mitigation within value chains commensurate with near-term 1.5 °C-aligned SBTs and neutralization of any remaining residual emissions once the company achieves its long-term SBT as in the Corporate Net-Zero Standard. Residual emissions levels per sector are suggested by the remaining 2050 levels in the table above.

As mentioned above, when SBTi published the Corporate Net-Zero Standard in 2021, it featured a handful of leading companies with long-term SBTs that met the new criteria. This first group of SBTi net-zero SBTs included Holcim cement company, which published the following target:

Holcim commits to reduce scope 1 and 2 GHG emissions 21 % per ton of cementitious materials by 2030 from a 2018 base year\*. Within this target, Holcim commits to reduce scope 1 GHG emissions 17.5 % per ton of cementitious material and scope 2 GHG emissions 65 % per ton of cementitious mate-

rials within the same timeframe\*. Holcim commits to reduce scope 3 GHG emissions from purchased goods and services 20 % per ton of purchased clinker and cement by 2030 from a 2020 base year. Holcim also commits to reduce scope 3 GHG emissions from fuel and energy related activities 20 % per ton of purchased fuels by 2030 from a 2020 base year. Furthermore, Holcim commits to reduce scope 3 GHG emissions from downstream transportation and distribution 24.3 % per ton of materials transported within the same timeframe. \*The target boundary includes land related emissions and removals from bioenergy feedstocks.

The Holcim target demonstrates a cement sector example of integrating top-down 1.5 °C climate scenarios with bottom-up mitigation actions and investments at the company level. The SBTi criteria and Net-Zero Standard provide guardrails for companies to know how much their emissions need to be reduced in a given year; however, the initiative does not presently focus on how companies achieve their emissions reductions. SBTi is adding a monitoring, reporting, and verification area to its work that will cover this aspect of companies targets. If the company has acceptable levels of remaining residual emissions in its long-term SBT completion year, then it will need to neutralize those emissions through permanent removals. This is an area with even greater scenario variance than the scope 1 and 2 emissions pathways. The IEA WEO21/NZE scenario data indicate that total industrial removals through biofuels production and direct air capture need to ramp up from less than one hundredth of one percent of emissions in 2020 to 26 % in 2040 and 228 % in 2050, thereby exemplifying the overshoot nature of this pathway.

Another industrial sector SBTi example comes from the steel company SSAB:

SSAB commits to reduce absolute scope 1 and 2 GHG emissions 35 % by 2032 from a 2018 base year.

Since setting its SBT in 2020, the company has accelerated the pace of its mitigation ambition and HYBRIT steel production demonstration project. Policy support, energy company collaboration, and new technology development are three aspects of the SSAB target that can be useful more broadly for industrial sector net-zero orientation.

These industrial company SBT examples illustrate the range of target formulations and approaches across subsectors and geographies. The SBT initiative focuses on how much companies need to reduce emissions to be aligned with 1.5 °C pathways—prescriptions for energy efficiency improvements, fuel switching, or other mitigation actions are not included in SBTi criteria on the understanding that the target-setting entities have the best understanding of how to reduce their emissions to achieve their targets. To bolster and supplement the mitigation intent component of company SBTs, the SBTi is adding ex post monitoring, reporting, and verification of how emissions are reduced, though these requirements are under development.

### Agenda for Future Research

Development and popularization of net-zero targets can accelerate the industrial sector transition to a low-carbon economy. Net-zero SBTs provide a global, cross-sector mechanism to define new best practices, mobilize investment capital, and stimulate the development of new institutions to coordinate mitiga-

tion action. Four areas of further research are suggested here to advance SBTs and the larger low-carbon transformation of the industrial sector.

- **MRV metrics.** Monitoring, reporting, and verification is needed to provide accountability and transparency around companies' performance after setting targets. The SBTi is adding an MRV function to its target setting platform that is expected to be deployed in early 2023. What MRV metrics should support the next generation of industrial sector net-zero targets?
- **Defining green.** The EU Taxonomy has provided a reference for classifying technologies that can help industrial companies, financial institutions, and other stakeholders to evaluate existing and forward options. However, as financial institutions seek to implement net-zero commitments in their investment and lending portfolios, there's a need for additional resources to define climate-aligned technologies in a range of industrial subsectors and geographies.
- **Mapping beyond value chain mitigation and neutralization options for net-zero industrial companies.** In addition to quantifying residual emissions across a broad range of industrial subsectors, elaborating on permanent removal technologies and institutional mechanisms could help to create more standardized approaches commensurate with robust emissions reductions. Which industrial processes and technologies are most conducive to scaled up GHG emissions removals?
- **Blockchain integration for negative emissions accounting.** How can distributed ledger technology support an emissions removals accounting system that captures industrial companies' mitigation actions while ensuring additionality and thereby linking to global climate stabilization?

These interdisciplinary research questions can help to identify empirically-supported strategies for industrial leadership in the transition to a net-zero economy.

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