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Setting science-based targets:

A guide for electric utilities

Contents

Summary

In today's climate emergency, all companies need to reduce greenhouse gas (GHG) emissions to limit global warming to 1.5°C. The power sector has a crucial role to play: electric utilities are currently responsible for a substantial share of the world's GHG emissions - 13 gigatonnes of carbon dioxide ($GtCO_2$) or 41% of global energy-related CO_2 emissions in 2017 - and decarbonized electricity is an essential lever in enabling the low-carbon transition of other sectors, such as buildings and transport.

A GHG emissions reduction target is a key element of a company's climate strategy. Setting science-based targets (SBTs) has emerged as the dominant approach for companies to align their GHG emissions trajectory with climate science. The Science Based Targets initiative (SBTi) facilitates this process by providing target setting methodologies and a platform for companies to communicate and validate their commitments. As of June 2020, the SBTi had validated the SBTs of 17 companies from the electric utilities and energy-related sector. These 17 companies were collectively responsible for around 0.4 $GtCO_2$ of direct (Scope 1) CO_2 emissions in 2017 or about 3% of emissions from the sector globally. An additional 21 companies in the sector have committed to setting SBTs within the next two years.

While the power sector is critical to global efforts to reduce GHG emissions, only a relatively small - but growing - number of electric utilities have committed to SBTs. This guidance helps utilities develop and set SBTs. It reviews the SBTi approach to setting SBTs and the criteria that are specific to utilities. It then describes the typical emissions sources from electric utilities, clarifies how to classify Scope 3 emissions sources into its 15 categories and outlines the materiality of these categories, and presents common ideas on how to overcome potential challenges to setting SBTs. The World Business Council for Sustainable Development (WBCSD) is well-placed to develop this guidance through our broad membership and global scope, including 14 utilities, power producer and transmission and distribution companies headquartered in 11 countries.

Setting GHG emissions reduction targets in line with a 1.5°C-aligned scenario is challenging and the SBT trajectories reflect the magnitude of transformation needed: for a sector-average utility, the emissions intensity of power generation decreases by 76% from 2020 to 2030 under the 1.5°C-aligned pathway, reaching 100kgCO_2/MWh in 2030. The key message of this guidance is that while utilities, as any company, usually do encounter barriers to setting and making progress on their SBTs, they can surmount many of these challenges. Some **key barriers** and **recommendations** to overcome them include:

Utilities can face conflicts between their climate and broader sustainable development objectives. In some countries, utilities may also face structural or political limitations in their ability to meet SBTs due to government regulation or ownership. Climate objectives may be among one of several sustainable development objectives that a utility has set, such as goals on jobs retention and creation or reducing energy poverty. For instance, utilities operating coal-fired power plants in countries where coal mining is a large source of employment may face social and political challenges in phasing out coal-fired power generation. Also, in countries that subsidize fossil fuels, a move to low-carbon power generation without a shift in subsidies of equal amounts could lead to higher power prices, making electricity unaffordable for some households.

Measures to deliver a just transition can help overcome the social and political challenges of phasing out fossil fuel generation plants. Utilities can engage with governments and civil society stakeholders to encourage the inclusion of appropriate employment and social protection planning as well as skills and education policies in long-term government climate strategies. Government-owned utilities can also consider building support for SBTs by demonstrating how these targets would support the achievement of the country's nationally determined contribution (NDC).

For many electric utilities, as for many companies from other sectors, developing a robust Scope 3 emissions inventory is demanding. Scope 3 emissions can represent a substantial share of a utility's carbon footprint: one-third of utilities reporting to CDP have a Scope 3 emissions share of over 40%. A review of utility disclosures to CDP however also demonstrates that Scope 3 emissions reporting practices are inconsistent and, in some instances, incomplete. Full knowledge of a company's Scope 3 emissions footprint along the entire value chain can be complex due to the diversity and geographical spread of operations; yet, it is important to understand and contribute to reduce emissions across the value chain.

As a first step to understanding all sources of Scope 3 emissions and identifying the most material categories, Scope 3 screening is essential. From our review of disclosures to CDP, we found that the most material emissions sources are typically related to fuel- and energy-related activities, use of sold products, and investments. We recommend that resources are allocated to robustly evaluate emissions from the most material categories for which SBTs will be set.

Utilities have limited capability to impact some Scope 3 emissions sources; especially emissions related to electricity purchased from the wholesale market. When utilities buy electricity from the wholesale market, the Greenhouse Gas Protocol requires them to evaluate the associated carbon footprint using the local grid emission factor (a weighted average of emissions from all sources of electricity generation on the grid). Utilities hence have limited control and influence over these emission in the short-term.

One measure to mitigate this source of emissions is for utilities to increase their own generation of low- or zero-carbon electricity. Another option is to increase the purchase of electricity from certified green sources. However, this option may not be feasible in some regions due to limited availability of certified green power or restrictions on power purchase agreements (PPA) between generators and retailers.

Abating Scope 3 emissions from natural gas distribution and sales is a particular challenge for some utilities. The SBTi requires utilities distributing or selling gas to set an SBT on Scope 3 emissions related to the downstream use of this natural gas. Some utilities find it challenging to influence and reduce these downstream emissions.

One strategy to mitigate these emissions is to encourage increasing electrification of energy end-uses, in particular in buildings. Utilities could partially compensate for the financial impact caused by the reduction in natural gas sales with additional revenue from electricity sales, as well as new sources of revenue, such as the sale and installation of electric technologies, like heat pumps, and energy efficiency solutions. Utilities may also reduce emissions from natural gas sales by developing projects that would enable them to partially shift from natural gas to biogas sales in the short term and green hydrogen in the long term.

Utilities that overcome the challenges to setting and delivering on their SBTs will benefit by mitigating climate-related risks in their operations and supply chain. Also, an SBT increases the credibility of a company's climate strategy, which can boost shareholder and investor confidence, especially from the growing number of investors that are applying environmental, social and governance criteria when they screen their investments. By setting SBTs, companies can also improve their brand and strengthen their reputation with broader stakeholders, including civil society groups and governments. Finally, setting SBTs can support the scaling up of government climate ambition, as it delivers a signal to policymakers that large emitters are planning to make substantial emissions reductions.

Introduction

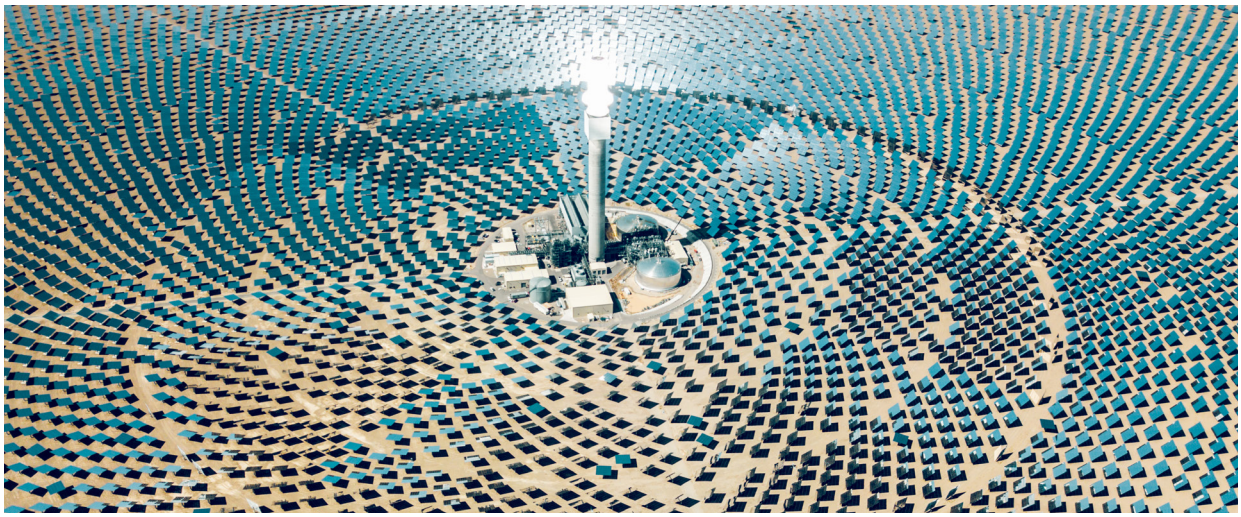
To avoid the most devastating impacts of climate change, global warming needs to be limited to 1.5°C above pre-industrial levels.[1] This will entail rapid and deep emissions reductions from all sectors, requiring an unprecedented collaborative effort from all: governments, business and civil society.

The business community needs to step up to respond to science and get on a trajectory to achieve net-zero emissions aligned with a 1.5°C scenario. While all companies must transition to net-zero emissions, utilities in particular need to take a leading role as the power sector accounts for a large share of global CO_2 emissions – about 13 gigatonnes of carbon dioxide ($GtCO_2$) or 41% of global energy-related CO_2 emissions in 2017.[2] Additionally, decarbonized electricity is a crucial lever in facilitating emissions reductions in other sectors through the electrification of energy end-uses, such as in buildings and transport.

Companies can highlight their commitment to meeting the goals of the Paris Agreement by setting science-based targets (SBTs). The Science Based Targets initiative (SBTi)[3] provides a platform for companies to express and validate their commitment to reducing greenhouse gas emissions (GHGs) in line with the Paris Agreement. Companies can use the SBTi to receive external recognition for their commitments, creating a race to the top between leaders in climate ambition.

As of June 2020, over 900 companies had committed to SBTi and over 380 had their target approved, of which 17 are from the "electric utilities and energy related" sector.[4] Given the relatively small - but growing - number of utilities that have committed to SBTs, and recognizing the importance of utilities in the global effort to reduce GHG emissions, we have developed this guidance to help utilities develop SBTs. In this guidance, we review the approach to setting SBTs and the SBTi criteria that are specific to utilities. We then describe the typical emissions sources from electric utilities, clarify how to classify Scope 3 emissions sources into its 15 categories and outline the materiality of these categories, and present common ideas on how to overcome potential challenges to setting SBTs.

The World Business Council for Sustainable Development (WBCSD) is well-placed to develop this guidance, through our broad membership and global scope, including 14 utilities, power producer and transmission and distribution companies headquartered in 11 countries. We have also recently launched our SOS 1.5 initiative, which supports companies on their journey to achieving net-zero emissions aligned with limiting global warming to 1.5°C. Through its flexible framework, SOS 1.5 helps companies move their carbon footprint to net-zero by identifying and removing barriers and mobilizing the value chain in the same direction.[5]



The target audience of this guidance is electric utilities that are considering setting SBTs or are revising their SBTs. Electric utilities engage in activities that are essential to providing end-users with access to electricity: generation, transmission, distribution and retail. Historically, a single vertically integrated utility conducted all of these activities. However, in many markets today, these functions have been unbundled, with different companies carrying them out, often in a competitive market. With this guidance, we primarily target utilities with electricity generation and retail businesses as these utilities have the largest opportunity to control their GHG emissions and hence drive significant emissions reductions from the sector. We also address challenges for utilities distributing and/or selling gas. Additionally, transmission and distribution companies may find this guidance useful in understanding the challenges their counterparties in the sector are facing and the actions they may take in the future.

While the target audience of this guidance is electric utilities, the issues identified here may also be relevant to companies in other sectors. In particular, utilities' Scope 1 emissions are electricity consumers' Scope 2 emissions. Thus, electricity consumers can set SBTs for their Scope 2 emissions using the same approach as electric utilities use for their Scope 1 emissions. Furthermore, some of the challenges and potential solutions identified relating to Scope 3 emissions may be common with companies in other sectors.

The structure of the guidance is as follows:

- Section 1 provides a description of SBTs, the SBTi and the benefits of setting SBTs for utilities.
- Section 2 describes the sources of GHG emissions from the power sector and how the SBT approach and SBTi criteria apply to these emissions sources.
- Section 3 presents the experience of utilities with SBTs, including the challenges they are facing, with a focus on those related to GHG emissions from the value chain – also known as Scope 3 emissions.
- Section 4 provides recommendations for utilities to overcome challenges.

This guidance takes into consideration the latest SBTi Criteria and Recommendations (Version 4.1) that will be in effect as of 15 July, 2020 as well as the Setting 1.5°C-aligned Science-based Targets: Quick Start Guide for Electric Utilities published in June 2020.[6,7] For further and more in-depth understanding of SBTs, we advise companies to also consult the following sources available on the SBTi website:

- Foundations of Science-based Target Setting explains the science behind SBTs.
- The Science-based Target Setting Manual provides step-by-step guidance and recommendations for setting SBTs.
- SBTi Criteria and Recommendations lists the criteria that SBTs must meet and additional recommendations on best practice in target setting.
- The Target Validation Protocol explains how SBTi assesses and validates targets.
- The Science-based Target Setting Tool is an Excel-based tool to calculate targets
- Setting 1.5°C-aligned Science-based Targets: Quick Start Guide for Electric Utilities provides guidance to utilities on setting targets aligned with limiting global warming to 1.5°C.

1 Science-based targets

1 Science-based targets

Science-based targets (SBTs) have emerged as the most recognized approach for companies to set an emissions reduction trajectory aligned with the Paris Agreement. This section describes the SBT concept, the role of the SBTi and the benefits of SBTs for utilities.

1.1 WHAT ARE SCIENCE-BASED TARGETS?

A target to reduce GHG emissions is a key element of a company's climate strategy. An emissions reduction target is science-based if it it aligns with meeting the goals of the Paris Agreement to limit the global temperature rise to well-below 2°C above pre-industrial levels and pursue efforts to limit the rise to 1.5°C. This alignment is determined by considering the latest scientific modeling of GHG emission trajectories that deliver on the Paris Agreement objectives. SBTs are short- to medium-term emissions reduction targets, with a timeframe of 5 to 15 years.

1.2 THE SCIENCE BASED TARGETS INITIATIVE

For validation and recognition of an SBT, companies can submit their commitments to the Science Based Targets initiative (SBTi). The SBTi is a collaboration between CDP, the United Nations Global Compact (UNGC), World Resources Institute (WRI), and the World Wide Fund for Nature (WWF). It aims to promote corporate climate action by supporting the expansion of science-based target setting so that it becomes standard business practice. The initiative promotes best practice in setting SBTs, establishes methodologies for target development, and assesses and validates companies' targets.

Companies can join the SBTi's Call to Action through the following steps:

1. Commit to set an SBT
2. Develop a target
3. Submit the target for validation by the SBTi
4. Announce the target.

1.3 BENEFITS OF SBTS FOR ELECTRIC UTILITIES

Utilities that set and deliver on their SBTs may profit from the following benefits:[8]

- **Aligning long-term business strategy with a low-carbon economy:** SBTs can be an essential element in a company's long-term climate strategy that considers the risks and opportunities arising from the transition to a low-carbon economy. The adoption of a science-based emissions trajectory enables companies to increase their climate resilience by reducing vulnerability to disruptive risks, such as policy and legal measures or adverse market developments.[9]
- **Increasing the credibility of a company's climate strategy and improving investor confidence:** External stakeholders see an SBT validated by the SBTi as a credible target that is aligned with the Paris Agreement objectives. A credible emissions reduction target can boost shareholder and investor confidence, especially from the growing number of investors that are applying environmental, social and governance (ESG) criteria when they screen their investments. In addition, companies making progress on achieving their SBTs signal to investors that they are managing their climate-related risks and opportunities appropriately.
- **Improving company brand and reputation:** SBTs increase the recognition of companies' climate action efforts and can strengthen their reputation with broader stakeholders, including civil society groups and governments.
- **Aligning with the TCFD recommendations:** The Task Force on Climate-related Financial Disclosures (TCFD) recommends that companies disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities. Setting an SBT is one way to align with this recommendation. More

information on aligning with the TCFD recommendations for utilities can be found in our TCFD Electric Utilities Preparer Forum report.[10]

- **Supporting a scale up of government climate ambition:** Utilities setting SBTs signal to policymakers that large emitters are planning to make substantial emissions reductions. This may help governments scale up their climate ambition, which in turn provides first-mover advantages to utilities with SBTs.

1.4 NET-ZERO EMISSION TARGETS

In addition to setting SBTs, companies can sign the Business Ambition for 1.5°C commitment, which is driven by numerous organizations, including SBTi, UN Global Compact, We Mean Business and supported by WBCSD. Companies signing up can align their decarbonization plans with the ambition of limiting global warming to 1.5°C by either setting an SBT aligned with 1.5°C or committing to reach net-zero emissions by no later than 2050, with interim targets in line with SBTi criteria. Table 1 below clarifies the differences between those two options in relation to SBTs.

The key difference between SBTs and net-zero emissions targets as a concept is that SBTs focus on emissions reductions in the short to medium term, whereas net-zero emissions targets are set with a longer-term time horizon.

Currently, there is no widely accepted and recognized definition of 'net-zero'. For this reason, companies are developing targets and making net-zero or climate neutrality claims based on their interpretations of these terms and their position on the contribution of carbon removals within those targets. To provide clarity, SBTi is developing guidance on climate neutrality and the use of carbon removals to meet net-zero targets.[11]

Table 1: Difference between SBTs and the Business Ambition for 1.5°C commitment

Commitment	Time horizon	Alignment with temperature goal
Science-Based Target (SBT)	• Mandatory: Achieve SBT within 5 to 15 years • Recommendation: Set additional emissions reduction target with a time horizon of over 15 years	• Scope 1 and 2: Well-below 2°C or 1.5°C • Scope 3: Aligned with relevant SBTi criteria for the desired ambition level, but not assessed by SBTi for ambition level classification
Business ambition for 1.5°C Option 1: SBT aligned with 1.5°C	• Mandatory: Achieve SBT within 5 to 15 years • Recommendation: Set additional emissions reduction target with a time horizon of over 15 years	• Scopes 1, 2 and 3: 1.5°C

Business ambition for 1.5°C
Option 2: Setting a commitment to reach net-zero emissions by no later than 2050, with interim targets in line with the SBTi criteria
	• Achieve net-zero emissions no later than 2050
	• Interim targets: Achieve SBT within 5 to 15 years
		• Long term: 1.5°C
		• Interim targets (same as SBT):
		  • Scope 1 and 2: Well-below 2°C or 1.5°C
		  • Scope 3: Aligned with relevant SBTi criteria for the desired ambition level, but not assessed by SBTi for ambition level classification

2 Setting science-based targets for electric utilities

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One of the key objectives of the SBTi is to define and promote best practices in SBTs by developing target-setting methodologies. This section provides an overview of the direct and indirect GHG emissions sources of electric utilities, describes the methodologies utilities can use to set SBTs, and explains the main criteria that SBTi apply when validating proposed SBTs for utilities.

2.1 EMISSIONS FROM ELECTRIC UTILITIES

The GHG Protocol's Corporate Accounting and Reporting Standard[12] for measuring and managing GHG emissions established the convention of reporting emissions by scope:

- **Scope 1** emissions are direct emissions from sources owned or controlled by the company.
- **Scope 2** emissions are those associated with purchased electricity, steam, heating and cooling for a company's own use.
- **Scope 3** emissions are all the other indirect upstream and downstream emissions that are related to the company's activities, i.e. these emissions are other companies' Scope 1 emissions.

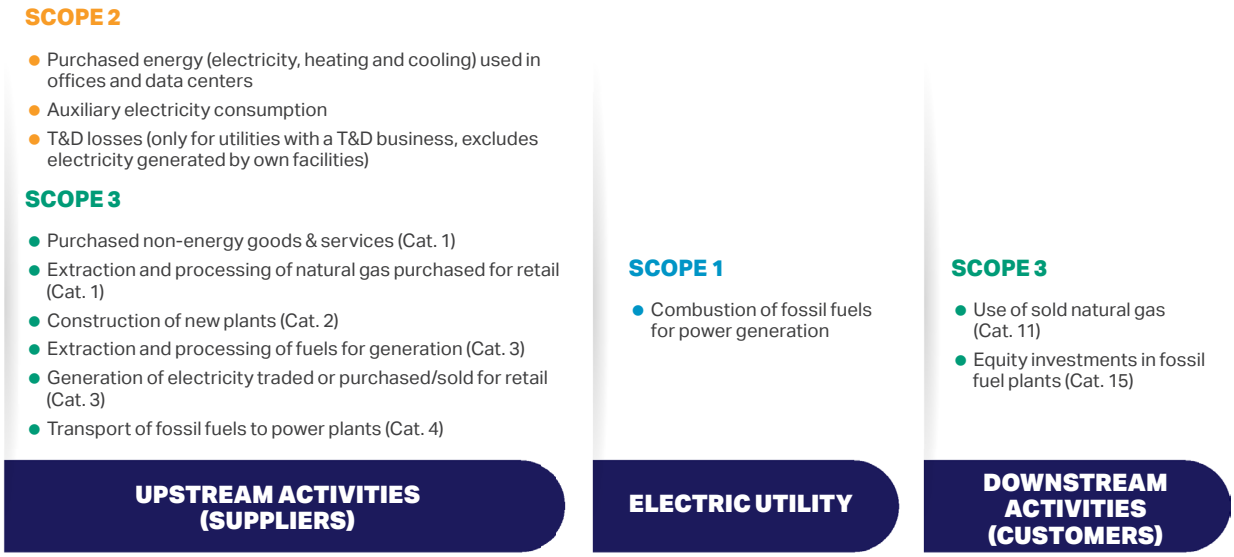
We describe the relevance of these emissions scopes to electric utilities below. Figure 1 illustrates the most relevant emissions sources in each scope for the typical electric utility.

SCOPE 1 EMISSIONS FOR ELECTRIC UTILITIES

Scope 1 emissions from electric utilities with generation activities largely originate from the combustion of fossil fuels to generate electricity. For utilities with a substantial share of fossil fuel generation, their Scope 1 emissions typically represent a large share of their carbon footprint. For utilities that have a purely renewable or nuclear-based generation portfolio or utilities that only have a retail sales business, emissions from the company's vehicle fleet and building heating can be the most material Scope 1 sources.

Figure 1: Summary of the typical material sources of emissions for Scope 1, 2 and 3 for electric utilities

For Scope 3 emissions, the relevant category for each emissions source is indicated in brackets.



SCOPE 2 EMISSIONS FOR ELECTRIC UTILITIES

Scope 2 emissions for electric utilities are related to energy consumption for business activities. Sources include electricity consumption in offices, commercial buildings and data centers. Another source of these emissions is power plant consumption of electricity purchased from the grid, for example, to start up power generation assets. For utilities with a power transmission and/or distribution business, emissions related to losses on their grid that are not already accounted for in Scope 1 (because they generated the electricity) are included here in Scope 2.

SCOPE 3 EMISSIONS FOR ELECTRIC UTILITIES

The GHG protocol groups Scope 3 emissions sources into 15 categories. The share of Scope 3 emissions overall and in each category varies considerably between electric utilities depending on factors such as the structure of the utility and their energy sources.[13] For example, when utilities have a gas retail business, the "use of sold products" category typically accounts for a substantial share of their Scope 3 inventory. The size of Scope 3 emissions compared to the company's complete GHG inventory may be decisive in the SBT process, as companies are required to set Scope 3 targets covering at least two-thirds of their Scope 3 emissions only if their Scope 3 emissions are greater than 40% of total Scope 1, 2 and 3 emissions (see Section 2.3 below).

Table 2 lists the 15 emissions categories and presents an assessment of the typical materiality (size of emissions and frequency of companies reporting it) of each category for electric utilities. The materiality assessment is based on a review of Scope 3 emissions from utilities' CDP disclosures. The table also indicates the ability of utilities to control (directly change) and influence (indirectly change) emissions from each category. We developed this assessment through feedback from WBCSD members. Table 2 assumes that electric utilities have both generation and retail activities.

Based on these insights, the material sources of Scope 3 emissions from utilities with both generation and retail businesses are related to the following activities (ordered by Scope 3 category):

- **Purchased non-energy related goods and services.** Utilities have many suppliers providing a wide range of goods and services, such as equipment maintenance, office supplies, information and communications technologies, chemical products and municipal water. Utilities should report emissions from this source under category 1- Purchased goods and services.
- **Construction of new plants.** Utilities should include the embodied carbon emissions associated with the acquisition or construction of new power plants in category 2-Capital goods.
- **Purchase of fossil fuels for generation activities.** The emissions related to the purchase of fossil fuels used for electricity generation mostly originate from the mining (category 3 - Fuel - and energy-related activities) and transporting of fossil fuels (category 4 - Upstream transportation and distribution) and their magnitude can vary depending on the source. Even though these emissions can be high in comparison to other Scope 3 emissions categories, they typically represent a relatively small share of the overall carbon footprint because Scope 1 emissions from fossil fuel combustion are more significant. For coal-fired power plants, for example, emissions from mining and transporting coal are on average around 10% of the total carbon footprint.[14]
- **Buying and selling electricity for retail activities.** Many utilities also buy and sell electricity from the market and the emissions related to this activity should be reported under upstream category 3 - Fuel - and energy-related activities. When buying on the wholesale market, the origin of the electricity is not known; therefore, utilities should use the local grid emission factor to calculate the carbon footprint. Category 3 - Fuel - and energy-related activities should also include transmission and distribution losses related to electricity purchases/sales for retail. Utilities do not need to report emissions related to transmission and distribution losses for electricity that they generate, as these are already included in their Scope 1 inventory. Utilities with a transmission and/or distribution business should account for emissions related to losses in their grid - that are not already accounted for in their Scope 1 inventory - in their Scope 2 inventory.

- **Buying and selling gas for retail activities.** Utilities should account for emissions related to buying and selling gas under Scope 3. Most of the emissions occur when the customer uses the natural gas; utilities should report this source under category 11- Use of sold products. This emissions source can represent a substantial share of a utility's overall carbon footprint, if it has relatively low Scope 1 emissions. Utilities should report upstream emissions related to the extraction and processing of natural gas purchased that is resold to customers under category 1- Purchased goods and services; in cases where these activities are within the organizational boundary of the utility, these emissions form part of their Scope 1 footprint.
- **Equity investments in fossil fuel plants.** Utilities that have chosen the operational control approach to setting their organizational boundary[15,16] report emissions from subsidiary companies in which they have a minority stake and non-operational control under category 15 - Investments. Utilities should include only the proportion of each plant's Scope 1 and upstream Scope 3 emissions representing the company equity share in their carbon footprint.

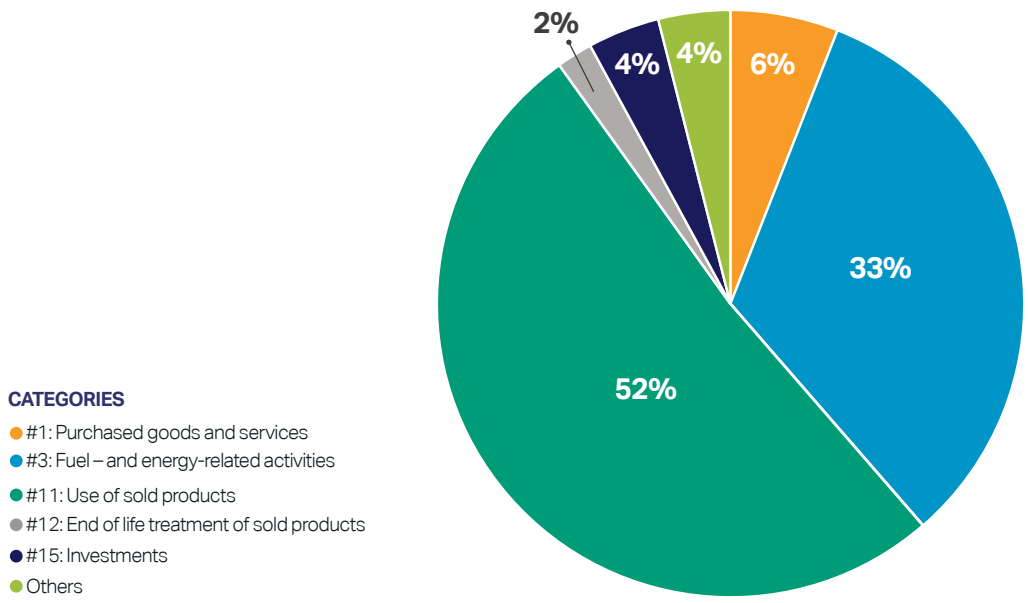
Table 2: Assessment of materiality and ability to control and influence Scope 3 emissions for utilities with generation and retail activities

	Scope 3 category	Sources of emissions	Materiality	Control	Influence
Upstream Scope 3 emissions	1. Purchased goods and services	Purchase of non-energy related goods and services (e.g. maintenance, office supplies, communication, purchase of chemical products and use of municipality water); upstream emissions from extraction and processing of purchased natural gas that is resold to customers	Medium	High	High
	2. Capital goods	Emissions related to the construction or purchase of new fixed assets (e.g. power plants, buildings, technical equipment)	Medium	Low	Medium
	3. Fuel- and energy-related activities	Upstream emissions of fossil fuels consumed in electricity generation (e.g. extraction of coal, natural gas, fuel oil and diesel); upstream emissions from third-party generation of electricity purchased for retail; transmission and distribution losses related to electricity purchased and sold for retail activities	Very high	Low	Medium
	4. Upstream transportation and distribution	Transportation of fuels (e.g. coal, natural gas, biomass, fuel oil and diesel) used for electricity generation	Medium	Low	Medium
	5. Waste generated in operations	Disposal and treatment of waste generated in the company's operations (in facilities not owned or controlled by the reporting company)	Low	High	Medium
	6. Business travel	Transportation of employees for business-related activities (in vehicles not owned or operated by the reporting company)	Low	High	High
	7. Employee commuting	Transportation of employees between their homes and their worksites (in vehicles not owned or operated by the reporting company)	Low	Low	Medium
	8. Upstream leased assets	Operation of assets leased by the reporting company (lessee) and not included in Scope 1 and Scope 2	Low	Low	Low
Downstream Scope 3 emissions	9. Downstream transportation and distribution	Transportation of by-products (such as coal fly ash) or transport of appliances (e.g. efficient lighting, electric boiler) sold to customers	Low	Medium	Medium
	10. Processing of sold products	Usually not relevant to utilities as products are used (category 11) and not processed	Low	Low	Low
	11. Use of sold products	Combustion emissions of natural gas sold to customers	Very high	Low	Low
	12. End of life treatment of sold products	Usually not relevant as there is no end-of-life treatment of sold products	Low	Low	Low
	13. Downstream leased assets	Operation of assets owned by the reporting company and leased to other entities in the reporting year, not included in Scope 1 and Scope 2	Low	Low	Low
	14. Franchises	Operation of franchises not included in Scope 1 and Scope 2	Low	Medium	High
	15. Investments	Only applies when choosing the operational control approach; in cases where a company has a minority stake and non-operational control of a company, account for emissions under this category, not under Scope 1.	High	High	High

To gain insights into Scope 3 emissions and reporting practices, we reviewed 60 electric utility disclosures to CDP for 2018, which collectively accounted for 12% (1.5 $GtCO_2$) of power sector emissions. Category 3– Fuel - and energy-related activities was the most frequently reported Scope 3 category in the sample (reported by 42 utilities). In terms of shares of Scope 3 emissions, category 11– Use of sold products – most likely linked to a gas distribution and/or supply activity – accounted for the largest share (52%) of collective Scope 3 emissions from the 60 reporting utilities (Figure 2).

Overall, emissions reporting practices from electric utilities to CDP are inconsistent. For example, in some instances, utilities erroneously allocated use of gas to category 9 – Downstream transportation and distribution instead of category 11– Use of sold products. Also, in certain cases, they erroneously allocated emissions related to the upstream extraction of purchased natural gas for retail sales to category 3– Fuel – and energy-related activities instead of category 1– Purchased goods and services. These inconsistencies reflect the challenges that utilities face in evaluating their Scope 3 footprint (for further information on these challenges, refer to Section 3.4). The inconsistencies in the data highlight the importance of this guidance and collaboration between utilities to improve understanding and reporting of Scope 3 emissions.

Figure 2: Share of Scope 3 emissions per category.
Evaluated by summing disclosures of Scope 3 emissions per category for all 60 utilities disclosing to CDP for the year of 2018.[17]



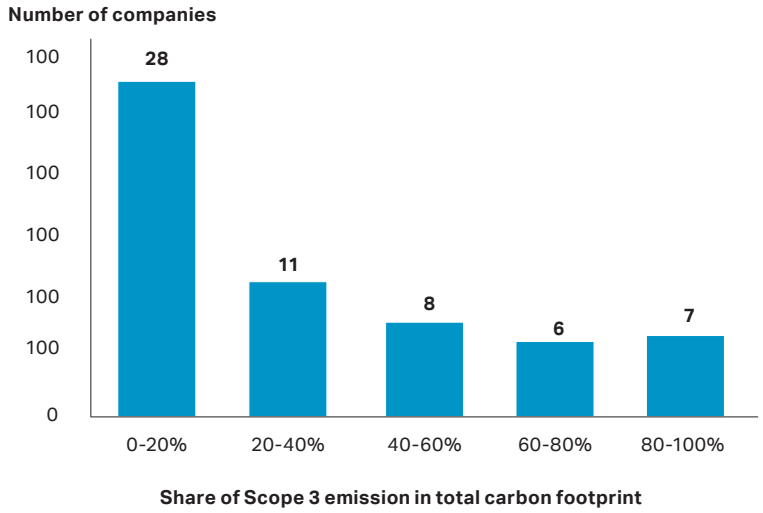
As shown in Figure 3, of the 60 electric utilities that disclosed to CDP for 2018, approximately one-third have a Scope 3 emissions share that is over 40% of the total carbon footprint, indicating the pertinence of Scope 3 target setting for utilities. Of the 28 companies with Scope 3 emissions shares in the 0-20% category, five companies did not report on Scope 3 emissions and eight companies reported Scope 3 emissions that amounted to less than 0.5% of their total footprint. These figures suggest that some companies may have reported an incomplete Scope 3 footprint and may therefore be underestimating their Scope 3 emissions. As a result, Figure 3 may not be a true representation of the distribution of Scope 3 emissions shares.

2.2 APPROACHES TO SETTING SBTS FOR THE POWER SECTOR

Carbon budgets – estimates of the amount of cumulative CO_2 emissions that can be emitted over a certain period of time while holding global warming at a certain limit – are the scientific basis of SBTs. Scenarios in line with these carbon budgets provide indicative emissions trajectories over time, per sector as well as across the economy.

For the purposes of setting SBTs, the relevant carbon budgets and emissions scenarios are those aligned with limiting global warming to 1.5°C, well-below 2°C or 2°C. Scope 1 and 2 emissions targets must align with 1.5°C or well-below 2°C, whereas Scope 3 emissions targets must align with limiting global warming to at least 2°C.[19] The SBTi classifies the ambition level of SBTs as well-below 2°C or 1.5°C based on Scope 1 and Scope 2 targets only; the temperature classification does not consider Scope 3 targets. Section 2.3 contains further information on required ambition levels. In developing its SBT methodologies and criteria, the SBTi drew from the International Energy Agency (IEA) Energy Technology Perspectives scenarios and emissions scenarios developed by the authors of the Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C.

Figure 3: Distribution of shares of Scope 3 emissions compared to the total carbon footprint (covering Scopes 1, 2 and 3) for electric utilities disclosing to CDP for 2018.[18]
Note that some companies appear to have reported an incomplete Scope 3 footprint.



Data: Powered by CDP, 2018

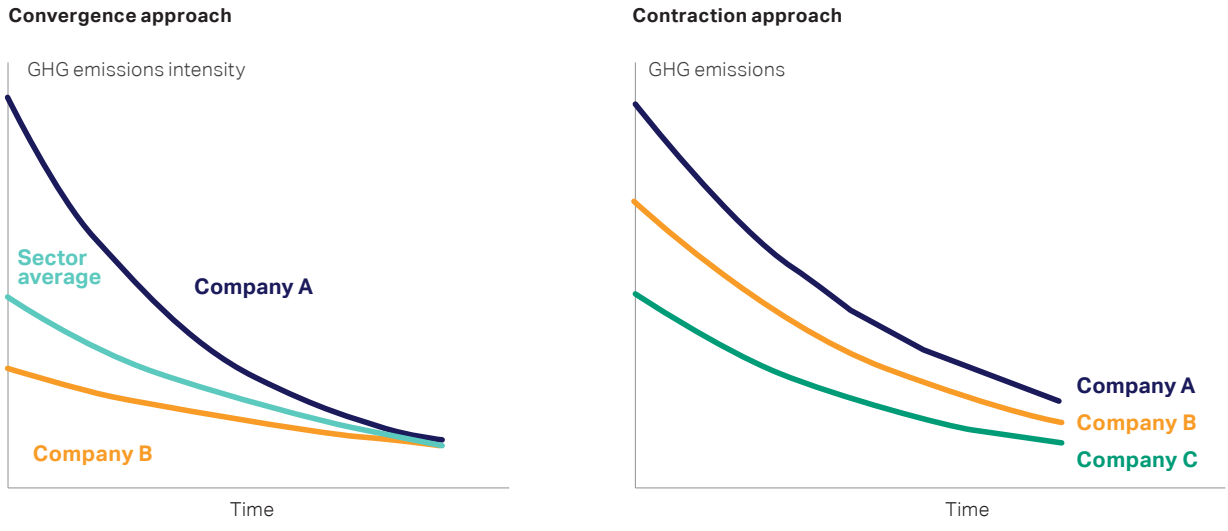
The SBTi methodology allocates carbon budgets to companies via two main approaches (see also Figure 4):

- **Convergence:** Companies within a sector reduce their emissions intensity to converge at a common value at some point in the future. Only sectors where output metrics, such as electricity generation or tons of crude steel, accompany sectoral emissions scenarios can use this approach. The convergence approach means that a company with a higher than sector-average emissions intensity needs to have larger annual emissions intensity reduction than companies in the sector with below-average emissions intensities. Further information on this approach – also known as the Sectoral Decarbonization Approach (SDA) – can be found in the SBTi report Sectoral Decarbonization Approach (SDA): A method for setting emission reduction targets in line with climate science.
- **Contraction:** Companies reduce their absolute emissions at the same rate as the emissions reduction required by the global carbon budget. All companies using this approach must commit to annual emissions reductions of at least: 4.2% for targets aligned with 1.5°C, 2.5% for targets aligned with well-below 2°C and 1.23% for targets aligned with 2°C (only for Scope 3).[20]

Sector-specific guidance from the SBTi sets out that utilities must use the convergence approach (or SDA) to define the minimum ambition level for their targets on emissions related to power generation.[21] To set a target using this method, utilities need to gather data on the volume of electricity generated and/or purchased and associated emissions in the base year and estimate electricity generation and/or purchases in the target year. Utilities can use the Science-based Target Setting Tool published by the SBTi to calculate the emissions target in absolute and intensity terms for the target year. Table 3 presents a summary of the target-setting approaches that utilities can use for Scope 1, 2 and 3 emissions, respectively.

Figure 4: Convergence vs contraction approach to setting SBTs

The left figure shows indicative emissions intensity trajectories under the convergence approach. Company A has a higher GHG emissions intensity than the sector average in the base year, while Company B has a lower initial GHG emissions intensity. In the long term, the emissions intensities of both companies converge to the sector average emissions intensity. The right figure shows indicative emissions trajectories under the contraction approach. Despite different volumes of GHG emissions in the base year, all companies apply the same annual percentage emissions reduction for a certain ambition level.



WELL-BELOW 2°C PATHWAY

The well-below 2°C SDA pathway for power generation is based on the IEA's Beyond 2°C Scenario published in Energy Technology Perspectives 2017.[22] The IEA uses a least-cost effort sharing approach to define the share of mitigation per sector: it entails deploying mitigation options with the lowest implementation costs per avoided ton of GHG. As of June 2020, a well-below 2°C aligned SBT for utilities is based on the convergence of individual utility emissions intensities from electricity generation in 2050 at -8 kg CO_2/MWh as shown in Figure 5. Despite this convergence point, the SBTi will not require companies to set negative emission intensity targets: if the SBT pathway for the company over the target period becomes negative, the emissions intensity target should be set at zero. This is an improvement on the previous pathway that required emissions intensities from electricity generation to converge at-33 kg CO_2/MWh in 2060. Utilities with a low-carbon generation portfolio today had perceived the previous pathway to be challenging, as it required them to reach zero and then negative emissions before the sector average and before negative emissions technologies are proven on a large scale.

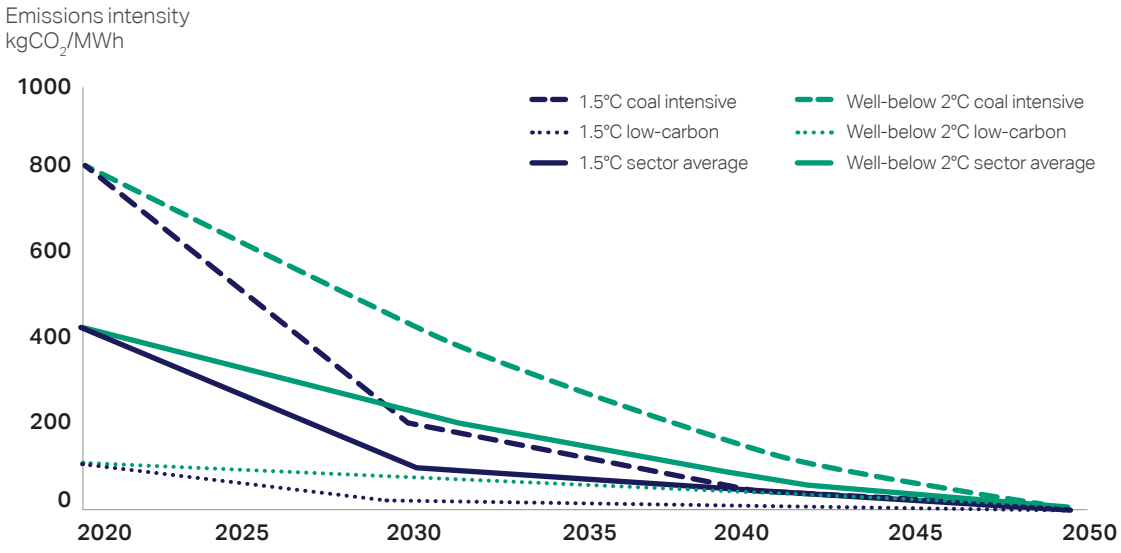
1.5°C PATHWAY

With the June 2020 publication of Setting 1.5°C-aligned Science-based Targets: Quick Start Guide for Electric Utilities, the sector can now also use the SDA to set 1.5°C-aligned SBTs on power generation. The pathway is based on the International Institute for Applied Systems Analysis' (IIASA) Low Energy Demand[23] scenario, which was one of the 1.5°C scenarios included in the IPCC's Special Report on Global Warming of 1.5°C. The Low Energy Demand scenario is one of the most ambitious 1.5°C scenarios included in the IPCC's Special Report: it explicitly excludes carbon capture and storage for fossil fuels and bioenergy and it is the lowest long-term global energy demand scenario ever published, with final energy demand in 2050 significantly below current values.

A 1.5°C-aligned SBT for utilities is based on the convergence of emissions intensities from electricity generation at zero in 2050 as displayed in Figure 5. The figure shows that compared to the well-below 2°C trajectory, the 1.5°C trajectory requires utilities to achieve more substantial short- to medium-term emissions reductions in the years 2020-2030. For the **sector average** electric utility, the emissions intensity of electricity generation decreases by 76% from 2020 to 2030 under the 1.5°C-aligned pathway, reaching 100 kg CO_2/MWh in 2030. This compares to a 47% reduction and an emissions intensity of 229 kg CO_2/MWh in the well-below 2°C pathway. Interestingly, in the long term, a utility with mostly low-carbon generation (e.g. emissions intensity of 100 kg CO_2/MWh in 2020) reaches zero-emissions by 2045 under the well-below 2°C trajectory and has five additional years to reach this point under the 1.5°C trajectory.

Figure 5: Evolution of emissions intensities of utilities under the SDA for power generation

The figure shows Scope 1 target trajectories obtained from the SBTi's Science-based Target Setting Tool (Version 1.2)[24] for a coal-intensive utility (dashed lines), the utility sector average (solid line) and a utility with mostly renewable generation (dotted line). Blue lines show pathways aligned with limiting global warming with 1.5°C; and red lines are compatible with well-below 2°C.



This is due to a small difference in the convergence levels assumed for the well-below 2°C and 1.5°C-aligned SDAs for power generation, which are based on different scenarios.

Figure 5 also illustrates indicative pathways for the Scope 1 emissions intensities of two types of utilities: one that is coal intensive and another that operates mostly low-carbon assets. These pathways highlight that utilities that are coal-intensive need to make more significant emissions intensity reductions (in absolute terms) than utilities that generate electricity mostly using low-carbon technologies. The SDA requires utilities with emissions intensities less than the sector average to equally make emission reductions. As a result, as shown in Figure 5, these utilities (shown in the dotted lines) typically have a target emissions intensity that is significantly lower than the sector average (shown in the solid lines) in the short- to medium-term.

In addition to setting SBTs for Scope 1 and Scope 2 emissions, the SBTi requires companies with Scope 3 emissions accounting for more than 40% of their total carbon footprint in the most recent reporting year to set SBTs for Scope 3 emissions. This emissions reduction target must cover at least two-thirds of total Scope 3 emissions. The following rules apply:

1. Irrespective of the share of Scope 3 emissions in the total company carbon footprint, companies with Scope 3 emissions related to the sale and/or distribution of natural gas or other fossil fuels must set SBTs covering these emissions.
2. If an electric utility has a Scope 3 share greater than 40% of its total carbon footprint, the utility must set a target on Scope 3 emissions related to the purchase of electricity for retail sales using the SDA for power generation. This includes purchases of wholesale electricity, as well as other transactions, such as bilateral contracts.
3. If these first two conditions do not already meet the two-thirds threshold, electric utilities can meet the threshold by covering additional Scope 3 categories using any accepted method, which includes supplier engagement, absolute contraction, economic intensity, physical intensity, or SDA.

In some instances, an individual Scope 3 category may require multiple target-setting approaches. For example, a utility's Scope 3, category 3 inventory could be composed of emissions related to electricity generation purchased for retail, and emissions related to the upstream extraction of coal purchased for generation activities. While it is necessary to set the target for electricity purchases using the SDA (see point 2 above), the company must use other accepted target-setting methods for coal purchases, as an SDA is currently not available for this activity. The company should then add up the emissions targets for each emissions source to derive an aggregate target covering the entire category 3.

Table 3 outlines the target-setting approaches and ambition levels required for SBT targets covering Scope 1 and 2 and different sources of Scope 3 emissions for electric utilities with a generation and retail businesses. Utilities that only have a retail sales business can also apply the SDA for power generation to set targets on emissions related to purchased electricity. Transmission and distribution companies that do not generate electricity are not required to fulfil specific criteria; they should apply the SBTi's general requirements, as described in section 2.3.

The target-setting approaches recommended by the SBTi set the minimum level of ambition required for SBT validation. Companies may choose to set mitigation targets based on science using an approach that differs from these recommended approaches. Companies using alternative approaches that seek to have the SBTi validate their targets should ensure that their targets meet the minimum ambition level and broader criteria set by the SBTi as summarized in section 2.3.

Table 3: Target-setting approaches and required ambition levels per emissions scope for electric utilities with generation and retail businesses

Sources of emissions	Target-setting approach	Ambition level
Scope 1 emissions from electricity generation	Use the SDA to evaluate the minimum ambition level for SBTs covering Scope 1 emissions from electricity generation. The SDA emissions intensity denominator should be MWh electricity generated.	Must align with a 1.5°C or well-below 2°C pathway
Scope 1 emissions from electricity and commercial heat generation	Electric utilities can either: 1. Set targets separately for electricity generation and commercial heat. In this instance, the SDA should be used to set a target covering emissions allocated to electricity generation as described in the row above and it is necessary to set a target for commercial heat generation using an absolute contraction approach. 2. Set a combined target for electricity and commercial heat generation using the SDA for power generation. The sum of emissions from electricity and heat generation are included in the numerator and the denominator is based on total energy generation (sum of electricity generation and commercial heat sold in MWh).	Must align with a 1.5°C or well-below 2°C pathway
Scope 2 emissions from own use of purchased electricity	Use the SDA for power generation to evaluate the minimum ambition level for SBTs covering Scope 2 emissions. The SDA emissions intensity denominator should be MWh electricity purchased.	Must align with a 1.5°C or well-below 2°C pathway
Scope 3 emissions related to purchase of electricity for retail sales (including purchase of wholesale electricity, as well as other types of purchases, e.g. bilateral contracts) and associated transmission and distribution losses	Use the SDA for power generation to evaluate the minimum ambition level for the SBT. The emissions intensity denominator must be MWh electricity purchased.	Must align with a 1.5°C or well-below 2°C pathway
Scope 3 emissions related to the end-use of natural gas or other fossil fuels sold and/or distributed by electric utilities	Companies must use the contraction approach to determine the SBT, as application of the SDA for the end use of natural gas is not practicable (for further information refer to Section 2.3).	Must align with a 1.5°C or well-below 2°C pathway
Scope 3 supplier/customer engagement targets for relevant and credible upstream or downstream categories	Companies can set a target to drive suppliers and/or customers to adopt SBTs that meet the SBTi criteria. For electric utilities, the most relevant categories could include "purchased goods and services" and "fuel- and energy-related activities" (see Table 2).	Suppliers/customers covered by the target must have SBTs in line with SBTi requirements
Scope 3 (all other emissions)	Companies can use the convergence approach (where available) or the contraction approach.	Must align with relevant SBTi criteria for the desired ambition level

2.3 CRITERIA FOR SBTS

The SBTi has developed a set of criteria to evaluate and approve SBTs. The criteria ensure a common approach across different sectors and enhance comparability of targets. Alongside the criteria, the SBTi has also developed recommendations for transparency and best practices; while these recommendations are not mandatory, they are highly encouraged. The latest version of the criteria and recommendations – Version 4.1 – will come into effect on 15 July, 2020.[25]

The key criteria (abbreviated with C) and recommendations (abbreviated with R) for SBTs relevant to utilities are:

- **Boundary (C1-3):** Majority of company-wide Scope 1 and 2 GHG emissions covered (at least 95%).
- **Bioenergy accounting (C4):** Emissions from bioenergy included alongside companies' inventory. If the company accounts biogenic carbon emissions from biofuels and/or biomass feedstocks as neutral, it must provide justification of the underlying assumptions.
- **Subsidiaries (C5):** The SBTi recommends that companies submit targets only at the parent or group level, not the subsidiary level.
- **Timeframe and progress to date (C6-7):** Targets must cover between 5 and 15 years into the future, starting from the date of target submission to SBTi for validation. In addition, the SBTi recommends (R3) that companies choose the most recent year for which data is available as the base year (not older than two years). In addition, it encourages (R4) companies to set long-term SBTs up to 2050. The target ambition must be forward-looking and companies cannot have already achieved targets by the date they are submitted to the SBTi.
- **Level of ambition (C8):** At a minimum, Scope 1 and 2 emissions targets must be consistent with limiting global warming to well-below 2°C; the SBTi encourages companies to pursue 1.5°C targets. The SBTi classifies company SBTs based on their temperature alignment. The classification considers only the ambition level of the Scope 1 and Scope 2 targets; the temperature classification does not consider Scope 3 targets.
- **Absolute vs. intensity (C9):** Electric utilities must set targets for their Scope 1 and 2 emissions at a minimum in line with the emissions intensity trajectory set by the SDA.
- **Combined scope targets (C11):** SBTi allows targets that combine scopes (e.g., 1+2 or 1+2+3), although the Scope 1+2 portion must always be in line with at least a well-below 2°C scenario.
- **Offset and avoided emissions (C12-13):** Offsets and avoided emissions do not count towards a company's progress on SBTs.
- **Reporting (C22):** Companies must disclose their GHG emissions inventory and make progress on achieving their SBTs on an annual basis.
- **Target recalculation (C23):** To ensure targets remain aligned with the most recent climate science, companies must review and, if necessary, recalculate and revalidate their SBTs at least every five years.

There are also specific criteria defining the requirements for Scope 3 targets:

- **Scope 3 screening (C16) and target (C17):** A company must complete a Scope 3 screening to identify the size of GHG emissions in each of the 15 categories. For this screening, the GHG protocol recommends that companies use less-specific data, such as average emissions factors or environmentally extended input-output data.[26,27] Companies are required to set a Scope 3 target if Scope 3 emissions account for more than 40% of the company's total carbon footprint.
- **Sale, transmission or distribution of natural gas or other fossil fuels (C17 and C20.2):** All companies involved in the sale, transmission or distribution of natural gas or other fossil fuel products must set a Scope 3 target for the use of sold products (Scope 3 category 11) irrespective of the share of these emissions compared to the total footprint.
- **Boundary (C18):** The Scope 3 target(s) must cover at least two-thirds of total Scope 3 emissions.

- **Ambition (C20):** SBTi considers emissions reduction targets (covering all Scope 3 emissions or individual Scope 3 categories) as ambitious if they fulfil any of the following:
    - Contraction approach:
        - Absolute emissions reduction targets are consistent with the level of decarbonization required to keep the global temperature increase at 1.5°C, well-below 2°C or at 2°C, equivalent to an annual emissions reduction of at least 4.2%, 2.5% or 1.23% per year, respectively.[28]
        - Economic intensity targets (e.g. tons of GHG per unit value added) that result in at least 7% year-on-year reduction of emissions per unit value added. The SBTi considers the reduction rate to be compatible with limiting global warming to between 2°C and well-below 2°C.[29]
    - Convergence approach: Physical intensity (i.e. emission intensity) reductions aligned with the relevant sector reduction pathway within the SDA; or targets that do not result in absolute emissions growth and lead to linear annual intensity improvements equivalent to at least 2%.

Despite the above outlined ambition criteria, companies must set targets on end-use emissions related to the sale, transmission and distribution of fossil fuels, such as natural gas sales, in line with limiting global warming to either 1.5°C or well-below 2°C (C20.2). SBTi does not permit targets aligned with limiting global warming to 2°C for this source of Scope 3 emissions. In practice, this means that companies can only use the absolute contraction approach to set a target for this source of emissions. For some utilities, a share of end-use emissions may come from the commercial buildings sector; while an SDA is available for the commercial buildings sector, utilities would have significant difficulties in applying it as it requires knowledge of the floor area of the buildings using the natural gas.

- **Supplier or customer engagement targets (C20.1):** As an alternative to setting a target for suppliers or customers based on absolute emissions, emissions intensity or physical intensity, a company can set a target to drive suppliers or customers to adopt SBTs that meet the latest SBTi criteria. The SBTi considers engagement targets acceptable when they meet the following conditions:
    - **Boundary**: Companies may set engagement targets for relevant and credible upstream or downstream categories.
    - **Formulation**: Companies must provide information in the target language on the percentage of emissions or annual procurement spending covered by the target.
    - **Timeframe**: Companies must fulfill engagement targets within a maximum of five years.
    - **Level of ambition**: The company's suppliers/ customers should have SBTs in line with SBTi requirements.

3 Experience with science-based targets in the electric utilities sector

3 Experience with science-based targets in the electric utilities sector

Section 2 provided an overview of typical emission sources from electric utilities, clarified how to classify Scope 3 emissions sources into the 15 categories and outlined the materiality of these categories. It also explained the methodology that utilities can apply to set their targets, and the key criteria that SBTs need to meet for the SBTi to validate them.

This section builds on this information by presenting insights into the application of SBTs by utilities, including experiences made and challenges faced, putting a particular focus on those associated with setting and meeting Scope 3 SBTs.

3.1 APPROVED SBTS OF ELECTRIC UTILITIES

Most approved SBTs of utilities are based on the carbon intensity of electricity generation. For example:

- EDP: "EDP commits to reduce Scopes 1 and 2 GHG emissions 75% per TWh by 2030 from a 2015 base year. EDP – Energias de Portugal S.A. commits to reduce absolute Scope 3 GHG emissions 40% by 2030 from a 2015 base year."
- Enel: "Multinational energy company Enel commits to reduce Scope 1 GHG emissions 70% per kWh by 2030 from a 2017 base year, limiting them to 125 gCO_2/kWh_{eq}, and achieve full decarbonization by 2050. Enel SpA also commits to reduce absolute Scope 3 GHG emissions for the use of sold products 16% by 2030 from a 2017 base year."
- Engie: "Service, business energy & regeneration company ENGIE commits to reduce power generation GHG emissions from Scope 1 and Scope 3, 52% per kWh by 2030 from a 2017 base year. ENGIE commits to reduce absolute scope 3 emissions from use of sold products 34% by 2030 from a 2017 base year."
- Ørsted: "Ørsted commits to reduce Scope 1 and 2 GHG emissions 98% per kWh by 2025 from a 2006 base year. Ørsted also commits to reduce absolute Scope 3 GHG emissions 50% by 2032 from a 2018 base year."
- Eneco: "Eneco commits to reducing GHG emissions per GWh from electricity consumed by its customers 25% by 2020 from a 2012 base year. Eneco also commits to reducing GHG emissions per household from the natural gas and district heating consumed by its private customers 16% by 2020 from a 2012 base year. Finally, Eneco commits to reducing GHG emissions per GWh of electricity used for employee operations 50% by 2020 from a 2012 base year.

Other utilities have set absolute emission reduction targets. For example:

- Iberdrola: "Iberdrola commits to reduce absolute Scope 1, 2 and 3 GHG emissions 20% by 2030 from a 2017 base year."
- NRG Energy: "NRG Energy commits to a 50% reduction of absolute GHG emissions by 2030 from a 2014 base-year (Scopes 1, 2 & 3). The company also has a long-term target: a reduction of 90% absolute GHG emissions by 2050 from 2014 levels (scopes 1, 2 & 3)."

The SBTi website contains case studies on approved SBTs, including four from electric utilities.[30]

Most utilities have not (yet) set SBTs. To understand the barriers utilities may be facing in setting SBTs, we interviewed nine companies, including companies that have already set or are considering setting SBTs. We have grouped the findings into three parts: general challenges, challenges identified for Scope 1 emissions and challenges for Scope 3 emissions. While the findings are based on the experience of electric utilities, they may also be applicable to companies in other sectors.

These challenges reflect the magnitude of transformation needed to limit global warming to 1.5°C or well-below 2°C. Despite these challenges, developing and achieving SBTs can deliver benefits for utilities as listed in Section 1.3. Section 5 lists recommendations to surmount identified challenges.

3.2 GENERAL CHALLENGES WITH SETTING SBTS

Regular updates of SBTi criteria and validation approaches pose challenges for companies in the process of developing new targets. Newly available climate science means that organizations are regularly updating their climate and energy scenarios in line with the Paris Agreement objectives. The SBTi then includes emissions trajectories from these scenarios as updated requirements that company SBTs need to fulfil. An example of this change is the move from Version 3.0 to Version 4.0 of the SBTi Criteria and Recommendations. This introduced the requirement that all Scope 1 and 2 targets be compatible with limiting global warming to 1.5°C or well-below 2°C; setting targets aligned with limiting global warming to 2°C (which was permitted under Version 3.0 of the criteria) are no longer permitted for companies making new commitments.

While such updates are important to maintaining the credibility of SBTs, they pose challenges for companies that are developing or have already approved their target internally, or are currently discussing or validating their target with the SBTi. To manage this issue, the SBTi implemented a six-month transition period between the publication of Version 4.0 of the SBTi Criteria and Recommendations and its entry into force, providing companies with the opportunity to still submit targets that are compatible with Version 3.0 of the criteria.

Companies that have already set SBTs must – at least every five years – review and, if necessary, recalculate and revalidate their SBTs in line with the applicable SBTi criteria at the time of resubmission. This requirement is important to ensuring SBT alignment with the most recent scientific evidence on the scale of action needed to avoid the most severe impacts of climate change. The latest year in which companies with already approved targets must revalidate is 2025. This means that by 2025 (with no further changes to the SBTi ambition criteria), all validated SBTs covering Scope 1 and 2 emissions will need to align with limiting global warming to 1.5°C or well-below 2°C.

3.3 CHALLENGES RELATING TO SCOPE 1 EMISSIONS FOR ELECTRIC UTILITIES

Potential conflicts between climate and broader sustainable development objectives. Climate objectives may be among one of several sustainable development objectives that a utility has set, such as goals on jobs retention and creation or reducing energy poverty. For example, utilities operating coal-fired power stations in countries where coal mining is a large source of employment may face social challenges in phasing out coal-fired power stations required to meet their SBT. Also, in countries subsidizing fossil fuels, a move to low-carbon power generation without a shift in subsidies by an equal amount could lead to higher power prices, making electricity unaffordable for some households. Conversely, there are a wide range of synergies between decarbonization and sustainable development, and adequate planning can facilitate the achievement of these co-benefits.

Structural limitations due to government regulation or ownership. Historically, governments owned many utilities; today, some governments continue to be majority or key shareholders. Due to this ownership structure, some utilities may have less independence and flexibility to shift to low-carbon energy sources compared to other industries because governments might require them to fulfil a government-set mandate, for example, to use local fossil fuel resources or retain certain jobs. It may be potentially difficult for such utilities to set short- to medium-term decarbonization targets as required by the SBTi; however, long-term targets may be more feasible. On the other hand, governments can enable and accelerate decarbonization plans by providing a clear pathway and facilitating the transition process.

Long asset lifetimes compared to a SBTi target-setting period of 5 to 15 years. Electricity generation plants usually have long asset lifetimes; thus, utilities cannot easily make large changes to the generation portfolio in the short term. The planning and implementation of changes to generation portfolios, such as retirements and the addition of new capacity, requires time to implement due to external factors such as stakeholder engagement processes, legal procedures and authorizations, and the procurement and construction process. This makes the decarbonization timeframe for the power sector generally longer than the SBTi's 5- to 15-year target-setting period. However, it is generally easier for utilities to set longer term targets.

Low-carbon utilities perceive SDA pathway for power generation as challenging. Electric utilities with a low emissions intensity today perceive that it may be more difficult for them to achieve further Scope 1 emission reductions in line with the SBT methodology from an already low level compared to companies operating a higher proportion of fossil fuel-fired power plants that they may decommission in the short to medium term. Additionally, due to the SBTi criteria, it is more likely that utilities with low Scope 1 emissions intensities need to set SBTs covering their Scope 3 emissions.[31] Section 3.4 discusses Scope 3 target challenges.

Such challenges are a natural outcome of an emissions intensity convergence target-setting approach. The SBTi acknowledges this challenge but also encourages low-carbon utilities to demonstrate continued leadership by continuing on a path to zero emissions and expanding their target coverage to Scope 3, as necessary.

3.4 CHALLENGES RELATING TO SCOPE 3 EMISSIONS FOR ELECTRIC UTILITIES

Electric utilities, like all companies, must play a role in reducing emissions across the entire value chain. This section describes challenges associated with Scope 3 accounting and target setting. Section 4 lists recommendations to overcome these challenges.

Evaluation of Scope 3 emissions can be complex. A thorough understanding of a company's Scope 3 emissions is a prerequisite for setting mitigation strategies. However, not all utilities – including those that have engaged with the SBTi – have reported a complete and accurate assessment of their Scope 3 emissions. For many utilities, full knowledge of their Scope 3 emissions is a challenge due to the diversity and geographical spread of their operations. Furthermore, for assets where the utility has minority ownership, emissions data may not be available. Comprehensively evaluating and reporting Scope 3 emissions is an additional workload, for utilities as well as companies in other sectors, yet it is important to understand and contribute to reduce emissions across the value chain.

Some electric utilities perceive that their emissions reduction actions should prioritize Scope 1 emissions as direct emissions from power generation account for a substantial share of economy-wide GHG emissions. This may mean that those utilities are allocating limited resources to evaluate their Scope 3 emissions.

Inconsistent assessment of Scope 3 emissions. As highlighted in Figure 3, reported Scope 3 emissions data are not always robust nor complete, and hence also not fully comparable between utilities.

For some Scope 3 categories, primary data may not be available. In the case of the purchased goods and services category, suppliers may not always be able or willing to disclose the carbon content of their products to customers. Also, when suppliers do provide this information in the form of an environmental product declaration, the quality of information provided may not meet the highest standards as the demands for this information do not always justify the costs to the supplier.

An alternative to using primary data is the use of emission factors to calculate Scope 3 emissions. These emissions factors can come from diverse sources, such as life cycle analysis databases or scientific literature. The potential use of different data sources across companies means that it is difficult to compare Scope 3 emissions and hence SBTs between utilities.

Another factor adding to the limited comparability of targets is the flexibility provided to companies setting Scope 3 emissions targets on their Scope 3 emissions. The SBTi criterion requires companies with Scope 3 emissions that are greater than 40% of their total carbon footprint to set a target that covers at least two-thirds of their Scope 3 footprint. As the materiality of the 15 Scope 3 categories differs across utilities, the Scope 3 categories that utilities choose to set SBTs for could vary from company to company. In addition, the SBTi has developed multiple options for companies to set Scope 3 targets, including the SDA, contraction approach, supplier or customer engagement targets and economic intensity targets. This flexibility in defining targets is on the one hand desirable as it recognizes the inherent differences in Scope 3 emissions between companies and provides multiple options to overcome methodological challenges to setting targets. On the other hand, the number of different options for setting Scope 3 targets also reduces the comparability of these targets between companies.

The limited comparability of Scope 3 targets poses challenges for companies that set their emissions reduction targets by benchmarking their ambition level with sector leaders' SBTs. Companies using benchmarking may not actually be setting targets with the same level of ambition due to the lack of consistency in assessing Scope 3 emissions. The inconsistencies identified also raise questions as to the scientific integrity of Scope 3 emissions reduction targets. In addition, other parties, such as environmental, social and governance (ESG) ratings agencies and investors, are assessing companies by comparing their emissions reduction targets; lack of comparability with SBTs limits the strength of conclusions drawn from such an analysis.

Utilities have limited capability to impact some Scope 3 categories. Companies required to set targets for their Scope 3 emissions need to cover at least two-thirds of these emissions. However, as highlighted in Table 2, companies have only limited influence or control over several upstream and downstream Scope 3 emissions categories. For example, when utilities buy electricity from the wholesale market, the Greenhouse Gas Protocol requires utilities to evaluate the associated carbon footprint using the local grid emission factor (a weighted average of emissions from all sources of electricity generation on the grid). Utilities hence have limited control and influence over these emissions. Also, companies could have limited control over the emissions footprint of their suppliers because of possible limits in the choice of suppliers, meaning that it is difficult to leverage the buyer position to create change.

Abating emissions from natural gas distribution and sales is a particular challenge for some utilities. Many electric utilities sell both electricity and gas to end customers. SBTi Criteria C17 requires all companies involved in the sale or distribution of natural gas to set a Scope 3 target for downstream emissions from this activity, irrespective of the size of this emissions source in the overall carbon footprint. Companies perceive that the primary way in which they can control these emissions is to reduce natural gas sales; however, this action doesn't mitigate emissions from natural gas use globally as it is most likely to shift the emissions to a utility that has not committed to SBTs. Reducing gas sales may not be feasible for some utilities due to government mandates.

Despite these challenges, it is nonetheless important that electric utilities understand and set targets for their Scope 3 emissions. Targets can create demand signals for suppliers, encouraging them to deliver lower-carbon products and services. In particular, it is important that companies buying and selling electricity for retail activities create demand for low-carbon electricity generation. Setting targets for the downstream value chain can also encourage utilities themselves to create innovative business models that deliver low-carbon solutions to their customers.

4 Recommendations

Section 3 explained the challenges that electric utilities face when setting SBTs and developing emissions mitigation plans to meet these targets. This section lists recommendations for utilities on how to overcome some of these challenges.

Utilities should develop a comprehensive understanding of their Scope 3 emissions. A Scope 3 screening is an essential first step in understanding all sources of emissions and identifying the most material Scope 3 emissions categories. Table 2 above summarizes the typical materiality of each Scope 3 category for electric utilities. We recommend that utilities allocate resources to robustly evaluate emissions from the most material categories for which SBTs will be set.

Increased collaboration can improve understanding of mitigation options for Scope 3 emissions. In general, companies are reluctant to commit to targets without understanding how they can meet them. Knowledge sharing between utilities on the various approaches to reducing Scope 3 emissions across the value chain can support companies in developing a viable roadmap to meet their SBT commitments. It is also important that utilities increase collaboration with their value chains to identify new ways to reduce Scope 3 emissions.

Encouraging downstream energy efficiency can support the achievement of Scope 1 and Scope 3 SBTs. Where the utility sells its generated electricity directly to consumers, increased efficiency in electricity end-uses will lead to a reduction in the quantity of electricity sold, as well as Scope 1 emissions. For utilities that sell electricity generated by another company or that sell natural gas, encouraging end-use energy efficiency is an approach they can use to reduce Scope 3 emissions. Utilities could partly offset the loss of revenue due to reduced electricity or natural gas sales with earnings from the sale and installation of energy-efficiency measures.

Utilities can abate Scope 3 emissions related to buying and selling electricity by increasing their own low-carbon generation portfolio or the purchase of certified green electricity. Frequently, utilities that operate generation and retail businesses purchase, distribute and sell electricity generated by other companies. One measure to mitigate these emissions is for utilities to increase their own generation of low- or zero-carbon electricity. Another option is to increase the purchase of electricity from certified green sources. However, this option may not be feasible for some utilities due to limited availability of certified green power in some regions – or restrictions on power purchase agreements between generators and retailers, making it compulsory for utilities to purchase electricity from the national pool.

Utilities can reduce Scope 3 emissions related to natural gas sales by driving electrification and fuel switching, in particular in buildings, and hence reduce the quantity of gas sold. Utilities could compensate for the financial impact caused by the reduction in natural gas sales with additional revenue from electricity sales, as well as revenues from the sale and installation of electric technologies such as heat pumps. Utilities located in regions with local bioenergy resources can also reduce emissions from natural gas sales by partially shifting from natural gas to biogas sales. A longer-term alternative to gas could be the use of green hydrogen as a fuel, for example, in high-temperature thermal processes. Overall, the adoption of new business models would aid utilities in setting and achieving their SBTs related to gas use.

Utilities with fossil-fuel power plants should consider actively reducing Scope 3 emissions from the purchase of fossil fuels. Utilities with SBTs may consider that an active approach to mitigating this source of emissions is not necessary because steps taken to reduce their Scope 1 emissions, such as by displacing fossil fuel generation with renewable energy generation, will also reduce the Scope 3 emissions related to the purchase of fossil fuels. However, alongside the phasing out of fossil fuel generation, utilities can adopt active approaches to support additional Scope 3 emissions reductions.

This may include, for example, the procurement of fossil fuels based on geographical proximity to reduce transport-related emissions.

Evaluate climate performance indicators when investing in power generation assets. Investments in other companies' generation plants is a common practice for utilities. When assessing investment opportunities, companies should assess the associated climate-related risks and opportunities and make decisions in alignment with their decarbonization ambitions. This would generally imply the prioritization of investments in low-carbon assets.

Utilities can engage with government and civil society stakeholders to ensure their SBTs are compatible with broader sustainable development objectives. Measures to deliver a just transition can help overcome the social and political challenges of phasing out fossil fuel generation plants. To support a just transition, utilities can:

- Engage with relevant governments and civil society stakeholders to encourage the inclusion of appropriate employment planning, skills and education policy, and social protection planning in long-term government climate strategies.
- Invest in training and skills provision for workers who will need to change jobs.

It is equally important to ensure that the low-carbon transition delivers an affordable and secure supply of electricity. Utilities can advocate for a shift in subsidies to low-carbon power generation as a transition measure to mitigate any negative impacts on electricity affordability.

Government-owned utilities can also consider building support for SBTs by demonstrating how such target would support the achievement of the country's nationally determined contribution (NDC).

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This publication is released in the name of the World Business Council for Sustainable Development (WBCSD). This document is the result of a collaborative effort between WBCSD, and representatives from utilities participating in the Energy Solutions project. A range of utilities in WBCSD membership reviewed the material, thereby ensuring that the document broadly represents the majority view of utilities within the project. It does not mean, however, that every utility agrees with every word.

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ABOUT THE ENERGY SOLUTIONS PROJECT

WBCSD's Energy Solutions project supports companies to progress their own energy transition, and play a leading role in delivering an affordable, reliable and net-zero carbon energy system in line with limiting global warming to 1.5°C.

- We empower energy users and energy providers to design and implement ambitious (energy-related) business strategies through our dedicated guides and peer-to-peer exchanges.
- We help companies advance deployment of sustainable energy solutions through capacity building and promotion of innovative business models in cross-sectoral platforms.

Our workstreams cover renewable electricity, low-carbon heating & cooling solutions and energy management & storage. Our goal is that WBCSD members – from energy users and energy service & technology suppliers to financiers – predominantly invest in sustainable energy technologies and services.

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WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world. We help make our member companies more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies.

Our member companies come from all business sectors and all major economies, representing a combined revenue of more than USD $8.5 trillion and 19 million employees. Our global network of almost 70 national business councils gives our members unparalleled reach across the globe. Since 1995, WBCSD has been uniquely positioned to work with member companies along and across value chains to deliver impactful business solutions to the most challenging sustainability issues.

Together, we are the leading voice of business for sustainability: united by our vision of a world where more than 9 billion people are all living well and within the boundaries of our planet, by 2050.

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