



SCIENCE  
BASED  
TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

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# QUICK GUIDE TO THE SECTORAL DECARBONIZATION APPROACH



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# 1. INTRODUCTION TO SCIENCE-BASED GREENHOUSE GAS REDUCTION TARGETS

## SCIENCE-BASED TARGETS DEFINITION:

Targets adopted by companies to reduce GHG emissions are considered "science-based" if they are in line with the level of decarbonization required to keep global temperature increase below 2°C compared to preindustrial temperatures, as described in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

Preliminary data indicate that global greenhouse gas (GHG) emissions related to energy use began to decouple from economic activity in 2014.<sup>1</sup>

Numerous public and private sector programs are helping to bend the curve toward global emissions mitigation. However, atmospheric concentrations of carbon dioxide continue to climb<sup>2</sup> and global climate modeling indicates that global mean temperatures are projected to increase by 3.7 to 4.8 °C by the end of this century<sup>3</sup>. Current GHG emissions trajectories and reduction targets are not aligned with the politically agreed-upon goal of limiting warming to a 2°C temperature increase above pre-industrial levels.

The purpose of science-based targets is to inform business stakeholders on the level of emissions reductions required to achieve the 2°C pathway and how this can inform future business activities and company greenhouse gas reduction targets.

A number of science-based target methods have been developed in recent years. This is a short guide to the Sectoral Decarbonization Approach (SDA) method. The Science Based Targets initiative has developed the above-mentioned definition for use throughout this document.

## 2. WHAT IS THE SDA?

The Sectoral Decarbonization Approach (SDA) is a scientifically-informed method for companies to set GHG reduction targets necessary to stay within a 2°C temperature rise above preindustrial levels.

The method is based on the 2°C scenario, one of the International Energy Agency's detailed CO<sub>2</sub> sector scenarios modeled in their 2014 Energy Technology Perspectives report. The Energy Technology Perspectives report's budget is consistent with the representative concentration pathway 2.6 (RCP2.6) scenario from the IPCC's Fifth Assessment Report, which gives the highest likelihood of staying within the global target temperature of less than 2°C in the year 2100. The probability is estimated by the IPCC at a minimum of 66 percent. The IEA 2°C scenario estimates an overall carbon budget of 1,055 GtCO<sub>2</sub> up to 2050.

The SDA is differentiated from other existing methods by virtue of its subsector-level approach and global least-cost mitigation perspective. SDA results and assumptions are based on mitigation potential and cost data from the IEA's TIMES model 2°C scenario, which identifies the least-cost technology mix available to meet final demand for industry, transport, and buildings services. The SDA is intended to help companies in homogenous, energy

<sup>1</sup> IEA, 2015. <http://www.iea.org/newsroomandevents/news/2015/march/global-energy-related-emissions-of-carbon-dioxide-stalled-in-2014.html>

<sup>2</sup> See monthly and annual data at <http://www.esrl.noaa.gov/gmd/ccgg/trends/>

<sup>3</sup> IPCC (Intergovernmental Panel on Climate Change). 2014a. Fifth Assessment Report. Summary for Policymakers.

intensive sectors align their emissions reduction targets with a global 2°C pathway. The SDA is best suited for companies in the following subsectors with well-defined activity and physical intensity data: electricity generation; iron and steel; chemicals; aluminum; cement; pulp and paper; road, rail, and air transport; and commercial buildings.

### 3. HOW WAS THE SDA DEVELOPED?

The SDA method was developed by the partners (CDP, WRI, & WWF) of the Science Based Targets initiative with technical support from Ecofys. The process to develop the method and accompanying online-tool also included extensive opportunities for feedback from stakeholders. Public workshops were held in London and Washington in 2014 to get input on the first draft. A technical advisory group of experts from industry and NGOs provided detailed input on various drafts of the method. A second draft of the SDA publication was released for public consultation along with three webinars to provide an overview of the method. During the public consultation process, written feedback was received from than fifty organizations representing a diverse range of sectors.

The science-based target setting tool, which was developed to assist companies in implementation of the SDA, was beta tested by more than twenty companies from various sectors. Beta testers provided calculation results, as well as detailed feedback on the functionality and usefulness of the tool. This helpful feedback throughout the SDA development process was carefully considered and integrated into the final version of the method and tool.

Please visit our website -<http://sciencebasedtargets.org/> - to learn more about the initiative.

### 4. HOW DOES THE SDA WORK?

The Sectoral Decarbonization Approach (SDA) allocates the 2°C carbon budget to different sectors. This method takes into account inherent differences among sectors, such as mitigation potential and how fast each sector can grow relative to economic and population growth. Within each sector, companies can derive their science-based emission reduction targets based on their relative contribution to the total sector activity and their carbon intensity relative to the sector's intensity in the base year.

Using the detailed sector-scenarios from the International Energy Agency's 2°C Scenario (IEA 2DS) model, it is possible to estimate the 2°C-compatible carbon intensity for any detailed-sector scenarios by dividing the total direct emissions of the sector in any given year by the total activity of the sector in the same year. This yields a sector intensity pathway.

For homogeneous sectors physical activity indicators - for example, tons of cement - are used as the allocation method. The assumption is that the carbon intensity of each company in a homogeneous sector will converge with the sector carbon intensity in 2050.

For the sector "Manufacture of light-road automotor vehicles", value added (revenue minus the cost of purchased goods and services) is used as indicator and is assumed to grow proportional to GDP growth.

A company's intensity pathway—given by the method—multiplied by their projected activity yield a company's carbon budget in absolute terms for the target period. In principle, the sum of these budgets should be contained within the sector projected budget given by the IEA 2DS.

In the absence of more sector-specific decarbonization pathways for heterogeneous sectors, the SDA method uses the compression assumption described in the methodology to limit emissions within the 2°C carbon budget. The activities and sectors covered in this method represent over 60 percent of current yearly global GHG emissions and up to 87 percent of the CO<sub>2</sub> budget up to 2050.

### 5. WHAT DATA ARE USED TO CALCULATE TARGETS?

The data that organizations need to calculate their emission reduction targets using the SDA method are:

- a) **Activities and sectors:** Identify the different activities of the company. Some companies may perform several activities that fall under different sector categories. Include in the target-setting process the most carbon-intensive activities and sectors of the company.
- b) **Activity levels:** Determine the activity in the base year for each sector where the company operates. Companies need to identify the specific activity indicator amounts for each sector as proposed in the method.
- c) **Commitment period:** Define the most appropriate commitment period, taking into consideration the organization's circumstances and the need to establish clear long-term targets aligned with science requirements. The earliest base year that can be selected by the company in the SDA is 2010 and the latest target year is 2050. By defining a base year and a target year, you will have defined the commitment period to which you are committed to follow an emission reduction pathway for your company.
- d) **Annual activity growth rate:** Forecast the annual activity levels for the commitment period, for example by calculating the growth rate based on historical data of the company or by using future growth rates as estimated by the company.
- e) **Electricity use:** Determine electricity use in the base year for each sector selected, expressed in kilowatt-hours and forecast future electricity consumption for the commitment period. Future electricity use is used to disaggregate scope 2 emissions targets.
- f) **GHG emissions:** Determine corporate base-year

scope 1 and scope 2 carbon dioxide emissions and corporate emissions disaggregated by each sector in which the company operates. The SDA emissions pathways are scaled to incorporate the effect of non-CO<sub>2</sub> emissions. Emissions offsets are not covered by the SDA.

## 6. WHAT IS THE SCIENCE-BASED TARGET SETTING TOOL?

Accompanying the method, a free, publically-available tool has been developed for companies to use.

The tool determines the company's target trajectory compared to the sector intensity pathway. Businesses can use the SDA method and tool to set scope 1 and/or 2 reduction targets informed by climate science or to compare the level of ambition of their current targets (scope 3 is only available for light road vehicles manufacturing). All the data described in section 5 above is required for use of the tool.

Please use <http://sciencebasedtargets.org/tools/> to access a web-based version of the tool.

## 7. WILL THE METHOD CHANGE OVER TIME? SHOULD THE TARGET BE REVISED?

The SDA method uses both sectoral GHG emissions pathways and sectoral activity growth projections. Both can deviate over time due to changing decarbonization or demand rates. This fact requires that the method is periodically revised to check the validity of the projections used, including all the carbon budget assumptions. Regularly updating the global budget figure will constitute an important condition of the robustness and integrity of the method.

Companies should also revise and check achievement of their targets, by checking if activity matched their previous projections and if intensities are below their specified pathway.

## 8. CAN I USE OTHER SCIENCE-BASED TARGET SETTING METHODS?

Other methods exist to set science-based GHG reduction targets. Each method has its strengths and weaknesses and there is currently no universally preferred approach. Companies should review the various methods and choose the method or methods that are best suited for their business.

## 9. WHAT ARE THE KEY LIMITATIONS OF THE SDA?

While the SDA succinctly summarizes subsector emissions and activity pathways that are consistent with a 2°C climate stabilization scenario, it has significant limitations for some sectors, companies and situations. The SDA approach does not cover all sectors, economic activities, or types of emissions. Appendix VI of the SDA methodology describes the SDA's subsector classification

assumptions, but boundaries must be clearly defined to avoid exaggerated mitigation through outsourcing or leakage and create more consistency across company targets within a sector.

The SDA's global convergence assumption also creates potential equity and distributive issues that may affect companies in certain regions.

Finally, the SDA is reliant on cost, technology, market, and demographic assumptions that are likely to vary before 2050.

**CDP**

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

**World Resources Institute (WRI)**

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

**WWF**

WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption. (<http://wwf.panda.org>)



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