

Method Description – Evaluating the 1,5°C conformity of BASF's climate protection targets

There is a scientific consensus that global warming correlates with the rise in the concentration of greenhouse gases in the atmosphere. Human-induced emissions significantly contribute to the increase in greenhouse gases in the atmosphere.

The Paris Agreement is a self-commitment by states to limit global warming to well below 2°C and preferably to pursue a 1.5°C target to limit harmful effects of climate change on humanity. National targets have not been broken down at the corporate level, so there is no reference value to measure corporate climate targets against. We at BASF support the Paris Climate Agreement.

To limit global warming to 1.5°C, an absolute amount of CO₂ can be estimated (CO₂ budget) that must not be exceeded. The remaining CO₂ budget is regularly reviewed (latest state of science) and thus is not a fixed value. A possible reference value can be taken from the respective current IEA study "Net Zero by 2050".

To comply with ESRS, companies must check whether set climate targets are consistent with limiting global warming to a maximum increase of 1.5°C. How the scientific proof is to be provided is left to the companies.

As a reference for a review at BASF, the IEA study "Net Zero by 2050" is used. The study divides the remaining CO₂ budget among different sectors and subsectors. The budget allocation takes into account growth assumptions and available CO₂ abatement options within the sectors. The study exclusively considers direct emissions (Scope 1 emissions) and emissions related to energy consumption. Energy consumption includes emissions from both steam and electricity generation. The generation of steam and power can either be done by the company itself (resulting emissions are accounted for as Scope 1 emissions) or by an energy provider (resulting emissions are accounted for as Scope 2 emissions). The IEA study is updated every two years. This review is based on the state of the 2021 study, as BASF's target was set in 2018/2019 and thus the CO₂ budget mentioned in this study fits the timeframe. The sector "Chemicals" is applied as a reference sector.

Based on the production volumes in 2020 and the targeted volumes in 2030, BASF is assigned the proportional part of the CO₂ budget for 2030 that BASF must adhere to. This budget includes the direct process emissions described in the previous paragraph as well as emissions from energy generation required for production. The IEA study divides the chemical sector into primary chemicals (ammonia, methanol, and high-value chemicals (HVC)) and other chemicals that are usually produced based on primary chemicals. For primary chemicals, the expected production volume in 2030 is described in addition to the emission reduction path for the entire chemical sector. Based on these figures, the emission reduction path until 2030 for "Other Chemicals" can be derived by difference formation.

For the subsectors of primary chemicals, a percentage reduction in emission intensity from 2020 to 2030 can be derived from the IEA study. Based on this percentage reduction, the emission budgets in 2030 are dependent on the targeted volume. It should be noted that this approach does not consider that there are already plants today that have a significantly lower emission intensity than the considered average. This is the case for all BASF primary chemicals, but especially for the ammonia and methanol plants. Early conversion to lower-emission processes is therefore not acknowledged by this approach.

To manufacture chemical products, large amounts of energy are often required, which also need to be decarbonized. Steam generation is considered part of the chemical industry to be transformed and is therefore subject to the same transformation rate as chemical plants. On the other hand, low-emission technologies have already been established for power generation, which need to be further expanded. Therefore, the GHG emissions from electricity procurement (Scope 2 emissions from electricity procurement) are subject to the necessary transformation rate of the energy sector. The IEA study also sees a reduction in emission intensity by 2030 here. The self-generated electricity is produced in combined heat and power plants, which are highly efficient due to the coupled energy generation and cannot be replaced by separate generation of the respective energy carriers electricity and steam in their efficiency. The electricity generated in this process is therefore considered separately from purchased electricity in its transformation rate (Scope 1) and is subject to the same transformation rate as steam generation.

Scope 3 Target

Scope 3 emissions in categories 3.1 to 3.15 are attributed to the upstream and downstream value chain. The modeling approaches for this are provided by the Corporate Value Chain (Scope 3) Accounting and Reporting Standard according to the Greenhouse Gas Protocol and the WBCSD Guidance for Accounting and Reporting Corporate GHG Emissions in the Chemical Sector Value Chain (WBCSD Chemicals).

Depending on the value chain depth of individual companies along the value chain, scope 3 emissions for the same end product add up to incomparable values. A multiple counting of scope 3 emissions is desired by the system approach. However, this does not allow a scientific derivation of a scope 3 CO₂ budget. Accordingly, scope 3 emissions are not considered in the Net-Zero study by the IEA.

However, the purchase of products and thus the emissions generated during their production are also the corporate responsibility of the "buyer" as well as the downstream emissions along the value chain of the "seller".

For this reason, BASF has set a specific Scope 3.1 target and implements various measures to close the carbon cycle ("Loop Solutions").

However, a consistency check with a 1.5°C target is not possible on this basis.