CORPORATE CLIMATE ACTION

A step-by-step guide for companies

Global Compact
Network Germany

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The UN Global Compact and the Global Compact Network Germany

The Global Compact was launched by the United Nations in 2000. It is a strategic and international platform for learning and dialog on sustainable and responsible corporate management involving civil society organizations, businesses and national governments. Working with its partners, the Global Compact has shaped the international debate on corporate sustainability, and the development of strategies and tools for its implementation. As a platform for multi-stakeholder learning and dialog, the Global Compact uses webinars, workshops, coaching, conferences and expert discussions in its work.

Through the local networks, which organize and run many of these events, businesses can advance sustainability topics that they feel should be addressed and then play an active role in shaping the dialog. The Global Compact Network Germany is one of the most active in the world with around 450 participants.

www.globalcompact.de/en

sustainable

Sustainable AG

sustainable AG (www.sustainable.de) is a management consultancy specializing in corporate responsibility (CR) and sustainable development topics. Together with our clients, we develop sustainability, CR and greenhouse gas (GHG) strategies and provide hands-on implementation support. sustainable offers the following consulting services: drawing up of corporate carbon footprints (CCFs), product carbon footprints (PCFs), life cycle assessments and water footprints, supporting companies in complying with any obligations within the EU emissions trading scheme and applying the methodological calculation approaches of the Science Based Targets (SBT) initiative for climate targets in accordance with the 2°C limit of the Paris Agreement. As a CDP scoring partner for the DACH region during the 2013-2015 period, we also provide support when it comes to answering the CDP's information request programs regarding forest, water and supply chain management.

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ABOUT THIS PUBLICATION

The strategic relevance of meaningful corporate climate action is steadily increasing. With the rising number of ever more concrete international and national requirements (e.g., the Paris Agreement and the introduction of reporting obligations on environmental, social and governance issues, such as the CSR Directive within the EU), expectations from various stakeholders (e.g., customers, investors, NGOs and consumers) are also growing. As a result, companies are increasingly faced with the question of how to anticipate and respond to regulatory developments and stakeholder expectations and an ever-evolving understanding of corporate responsibility for greenhouse gas (GHG) mitigation.

Pursuing the effective and holistic management of climate risks and opportunities is the foundation for the continuous improvement of climate performance and thus a key step towards addressing these challenges. Corporate climate action includes a long-term, strategic approach that takes into account both direct and indirect emissions for which companies must take responsibility, along with any business-relevant effects of climate change on companies' business models.

There already exists a plethora of publications and guide books on climate action, GHG management, GHG reporting, energy management and GHG accounting. While these publications attempt to provide a variety of perspectives on these themes, they tend to only examine some aspects of these high-level processes. Due to the wide range of topics and the sheer scope of relevant publications, companies wishing to manage their climate risks and opportunities unassisted often run into difficulties.

Lise Kingo, CEO and Executive Director of the United Nations Global Compact

"Combatting climate change to keep the global temperature rise well below 2 degrees is one of the most important challenges of our times—but it is also a great business opportunity. This guide offers companies a step-by-step approach to implementing a holistic climate strategy aimed at effectively managing risks and capitalizing on opportunities."

Therefore, the goal of this publication is to provide companies with concrete instructions on how to analyze and reduce GHG emissions in a strategic and holistic way. It connects existing publications with the contents of the present publication and aims to offer companies specific information, approaches and tools for introducing meaningful corporate climate action in a step-by-step manner. It contains five basic steps along with a chapter on important preparatory deliberations for introducing GHG management:

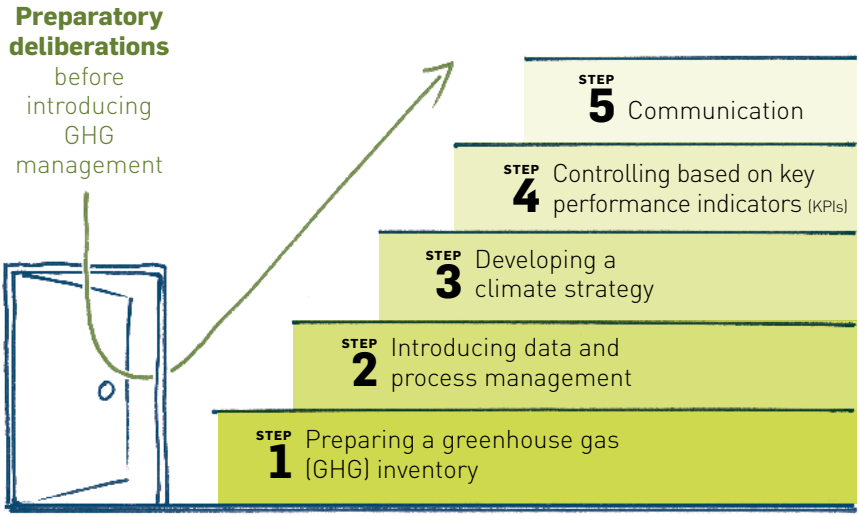


Figure 1: Steps towards meaningful corporate climate action.

Every step contains fundamental information along with concrete implementation suggestions. This publication thereby covers the entire process, from the preparatory deliberations all the way to the communication of the climate strategy. Wherever possible, reference is made to tools, guidelines, databases and standards in an effort to provide the user with the largest possible collection of support material.

A reference section including an overview of relevant tools, guidelines, databases, softwares and standards can be found at the end of the publication.

ABBREVIATIONS

CCF	Corporate carbon footprint
CDM	Clean development mechanism
CDSB	Climate Disclosure Standards Board
CO_2	Carbon dioxide
CO_2e	CO_2 equivalent
COP21	21st Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC)
CR	Corporate responsibility
CSR	Corporate social responsibility
CTG	Cradle-to-Gate
DEHSt	German Emissions Trading Agency (Deutsche Emissionshandelsstelle)
EIO-LCA	Economic input-output life cycle assessment
EMAS	Eco-management and audit scheme
EPA	Environmental Protection Agency
ESG	Environmental, social and governance
ETS	Emissions trading schemes
FTE	Full-time equivalent
GHG	Greenhouse gas
GHG Protocol	Greenhouse Gas Protocol
GRI	Global Reporting Initiative
HFC/PFC	Fluorinated hydrocarbons
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
KPI	Key performance indicator
LCTPi	Low Carbon Technology Partnerships Initiative
NAZCA	Non-State Actor Zone for Climate Action
NDC	Nationally determined contribution
NGO	Non-governmental organization
PCF	Product carbon footprint
SBT	Science Based Targets
SBTi	Science Based Targets Initiative
TFCD	Task Force on Climate-Related Financial Disclosures
UNFCCC	United Nations Framework Convention on Climate Change
UNGC	United Nations Global Compact
WBCSD	World Business Council for Sustainable Development
WTT	Well-to-tank
WTW	Well-to-wheel
WWF	World Wide Fund for Nature

DEFINITION OF TERMS

Activity data: This data indicates, e.g., the annual consumption of an emissions-generating substance.

Ambitious climate target: A long-term climate objective oriented towards the 2°C limit set by the Paris Agreement, e.g., through the application of methodological approaches of the Science Based Targets (SBT) Initiative.

CDP: The CDP (formerly Carbon Disclosure Project) is a non-governmental organization under UK law supported by numerous financial investors around the world. Its goal is to collect environmental and climate-related data from public companies through standardized questionnaires. In the CDP Supply Chain Program, companies can commission the CDP to obtain environmental and climate-related data from their suppliers in a standardized format.

Conversion factors: Factors for the conversion of substance flows or activity data which are available in various physical units, e.g., cubic meters to kilowatt hours, so that an emission factor referring to kilowatt hours can be applied.

Emissions trading schemes (ETS): Economic instruments for reducing GHG emissions. The goal of an ETS is to attach a price to GHG emissions. This occurs by binding GHG emissions to the purchase of GHG emission permits.

Emission hotspot: In a company, an emission hotspot is determined by a range of factors such as materiality, emission levels, emission control and others (→ 3.1). A company may have more than one emission hotspot among emission categories or sources.

→ Cf. page 54

Emission factors: Factors for the conversion of substance flows/activity data into GHG emissions.

GHG management: Process of managing the analysis of GHG emissions, the adoption of targets and key performance indicators and the implementation of measures to reduce and avoid emissions.

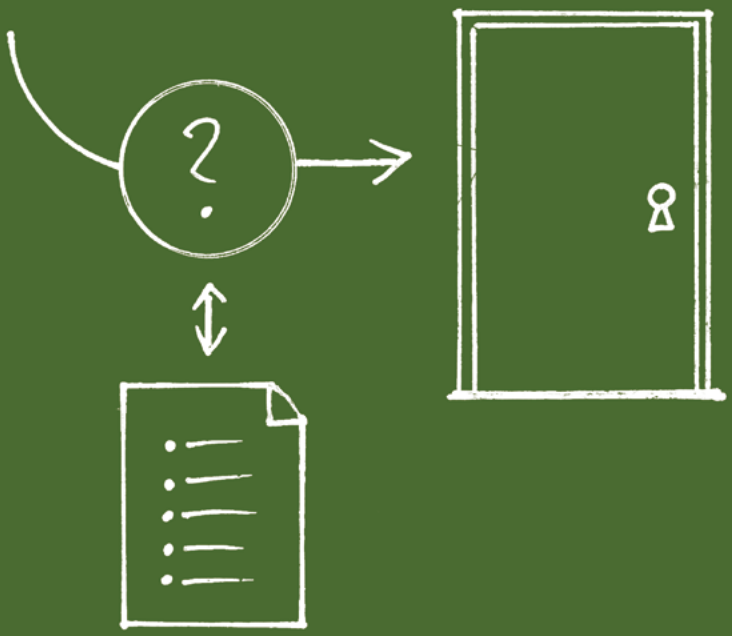
Non-financial reporting: Disclosure of a company's social, environmental and human rights information, also known as corporate social responsibility reporting or environmental, social and governance (ESG) information.

Scopes: The Greenhouse Gas Protocol has established three categories of emissions, so-called scopes. Scope 1 refers to all GHG emissions arising directly from a company's business activities, i.e., from the consumption of primary energy carriers and process emissions resulting from the production process (e.g., the production of steel and concrete). Scope 2 refers to indirect GHG emissions arising from the generation of all grid-bound energy purchased by the company. Scope 3 refers to all other indirect GHG emissions arising from upstream and downstream activities.

System boundary: By choosing a control approach (operational or financial control) a company also defines the system boundary of the GHG data collection and which sites or subsidiaries must be included in GHG accounting.

Science Based Targets: The SBT approach was jointly developed by the CDP, the UN Global Compact, the World Resources Institute and the WWF as part of the Science Based Targets Initiative (SBTi). It provides companies with a clearly defined path towards future-proof growth. By setting SBT, companies define the extent and timeframe within which they aim to reduce their GHG emissions. The website of the SBTi provides several methodological calculation approaches for developing a corporate climate target in line with the 2°C limit of the Paris Agreement.

PREPARATORY DELIBERATIONS



Corporate climate action is aimed at placing **greater value** on climate protection in corporate processes. However, successful climate action requires a structured approach even at the preparation stage.

The **preparation stage** consists primarily of deliberations regarding the organizational structure and data availability that is required for paving the way to the practical implementation. Companies define for themselves which objectives they would like to achieve.

They also decide who must be involved in the process to enable the development of a **suitable organizational structure** for climate action.

In this publication, it is assumed that the decision to engage for climate action has already been made within the company and that the necessary financial and personnel resources are available to the parties involved.

0.1 REASONS FOR CORPORATE CLIMATE ACTION

Transparency is a basic prerequisite for corporate climate action. It can also be the first goal. Transparent data collection and communication regarding GHG emissions arising from a company's business activities can contribute to the anchoring of sustainable business practices in the company's management. This, in turn, helps align business processes accordingly. In order to understand a company's business activities' impact on the climate, it is indispensable for the company to set up a complete inventory of relevant GHG emissions. Transparent data collection and the disclosure of all relevant information enable the identification and controlling of risks and opportunities along the value chain. Furthermore, initial mitigation measures can be identified, the break-even point of whose costs will be reached within a few years after their introduction. Transparent disclosure will also provide a foundation for internal and external corporate communication aimed at informing both a company's staff and the public about the company's activities.

→ www.bit.ly/IEAClimateChange

→ www.bit.ly/IEARenewableEnergy

→ www.bit.ly/IEAEnergyEfficiency

→ www.bit.ly/IEABuildingPolicies

Compliance is another fundamental goal when dealing with GHG reduction. Many countries already have numerous laws in place which necessitate operational management of climate risks and opportunities. The International Energy Agency (IEA) distinguishes between four areas and offers a 60-country-wide database with a search function for each country's relevant legal provisions: → Climate Change Database, → Renewable Energy Policies and Measures Database, → Energy Efficiency Database and → Building Energy-Efficiency Policies Database.

These provisions must be observed directly or indirectly by most companies. Multinational companies, utility companies and manufacturing companies with international production locations or activities tend to be most strongly affected by the various pricing mechanisms for GHG emissions (emissions trading systems, carbon tax). Further impetus is provided by the introduction of → national non-financial reporting obligations regarding environmental, social and governance issues, such as the CSR Directive within

The WBCSD *Reporting Exchange* provides in-depth and up-to-date coverage across over 70 sectors, 60 countries and is freely available (registration required) at:
→ www.bit.ly/SustainabilityReportingExchange

the EU or other reporting initiatives, some of which have turned previously voluntary reporting standards into legal obligations. Moreover, in 2016 and 2017, stock exchanges in India, Norway, Poland, Singapore and Taiwan have introduced listing requirements so as to guarantee disclosure on good corporate governance and on environmental and social issues. On a global level, the most relevant framework is the Paris Agreement, which was drafted during the 2015 climate negotiations of the United Nations (COP21). It became effective in late 2016 and aims to limit global warming to a maximum of 1.5 to 2°C. The Paris Agreement will have a major impact on framework conditions in many countries in the form of additional legislation. Nationally Determined Contributions (NDCs) were submitted to the UNFCCC by individual countries and provide country-specific information about the changing regulatory environment.

→ www.bit.ly/Paris-Agrmt

Nationally Determined Contributions of all countries are available in the *NDC Registry*
→ www.bit.ly/NDC-Registry

As climate change is a global challenge, **societal expectations** towards companies are growing on a global level, too. This leads to constantly rising demands on companies beyond simply meeting compliance requirements. At the same time, this means an opening up of opportunities for ambitious companies, enabling them to proactively use the expected changes of the corporate environment to positively influence their business development. Companies acting in an exemplary fashion in the area of climate protection are typically better prepared for upcoming market and social changes. It is also a way of ensuring that they remain economically viable for the long run. Furthermore, it can also lead to an improved public perception of their corporate brand through new products and business models.

0.2 ORGANIZATIONAL STRUCTURE

To achieve the overarching goals of transparency, compliance and the meeting of societal expectations, it is key to establish a solid database. In order to efficiently organize the collection of relevant data and other relevant processes, an organizational structure is required in which the roles of all involved persons are clearly defined and communicated. The complexity of the organization's GHG management structure is accordingly strongly linked with the company structure. Small companies with

only a few sites and no subsidiaries only need a very simple structure, and require only a few employees to be involved in the operational processes of climate action. Larger companies with numerous business units and various (production) sites will need to create a broader organizational and operational base and involve multiple departments and employees in →📄 GHG management.

→📄 Cf page 7 ff.

With the company's decision to act on climate risks and opportunities, one person should ideally be appointed to oversee corporate climate action including GHG management, establish the necessary structures and involve relevant employees from other departments (hereafter climate change officer). Within the company, GHG management is a cross-divisional function. The climate change officer, then, must keep the company management informed as to the state of GHG management while simultaneously coordinating and controlling the company's climate protection activities, targets and measures. It is recommended that additional staff be assigned to oversee the various levels and support the climate change officer's activities (→📄 Figure 2).

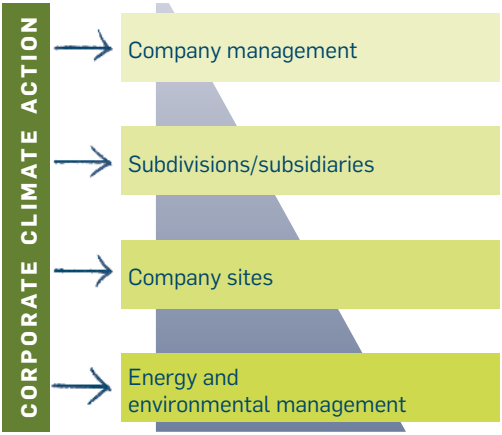


Figure 2: Levels of responsibility for climate action.

Which, and how many, employees will be assigned oversight responsibilities on each level depends upon both the overall data to be collected, the complexity and depth of the company structure as well as the strategy development. →📄 Figure 3 provides an implementation example:

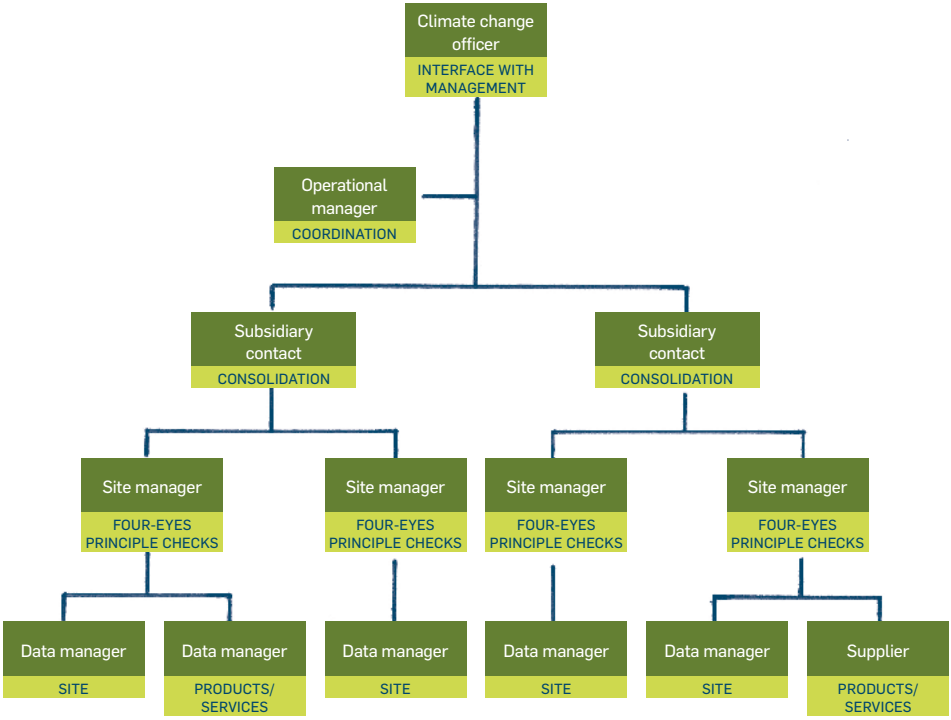


Figure 3: Exemplary organizational structure.

A variety of tasks arise in connection with GHG management. They are assigned to those overseeing the various levels:

- **Climate change officer:** Coordination of company-wide communication in collaboration with those overseeing the operational levels
- **Operational manager:** Adherence to the defined time and process schedule
- **Subsidiary representative:** Identification of climate protection measures, consolidation of site-specific data
- **Site manager:** Data aggregation and plausibility checks (four-eyes principle)
- **Data manager:** Collection and provision of basic activity data

Data managers are responsible for the collection and provision of basic data. The number of data managers can become very large, depending on the complexity of the company structure. Data managers are employees

who have access to the relevant information, such as production managers, energy managers at the different sites, fleet managers or those overseeing the company's real estate management. Data managers can also be based in different company departments, including purchase/procurement, logistics and compliance, particularly when it comes to information that is not site-related. Further information about which data must be collected for GHG management and which employees could be considered suitable data managers will be provided in → Step 2.

→ Cf page 42 ff.

Before starting GHG data collection, companies are advised to design a data collection structure and define a filing system for the GHG inventory, upon which they can then build over the years and establish a data and process management system. To create a structure which will remain both suitably transparent and clear over time, it is advisable to document all basic decisions, requirements, assumptions and other records that were used for preparing the GHG inventory.

If the introduction of a data and process management system (→ Step 2) is carried out before the preparation of the GHG inventory (→ Step 1), the implementation follows an ideal-typical procedure. Although a textbook approach would suggest setting up a data management system before calculating the company's GHG footprint, most companies actually starting their GHG management by calculating their GHG footprint as a first step.

→ Cf page 42 ff.

→ Cf page 18 ff.

STEP 1: PREPARING A GHG INVENTORY

The preparation of a GHG inventory lays the **foundation for corporate climate action**. A comprehensive GHG inventory is the prerequisite for developing **a climate strategy** and expedient climate protection measures. Only through the **continuous assessment of GHG emissions** can a company's progress be measured and managed.

Therefore, the basic inventory requirements are explained at the beginning of **Step 1**. This starts with practical tips on data collection and management, followed by a definition of the system boundaries along with considerations regarding the materiality of various emission categories. By collecting the available data and choosing suitable conversion factors, a company can be ideally prepared for compiling its GHG inventory.

1.1 GHG ACCOUNTING REQUIREMENTS

→ www.bit.ly/ISO14064-1

The following qualitative specifications for a GHG inventory should guide the respective actions whenever essential decisions regarding GHG management are made. These specifications are → ISO 14064 compliant and roughly follow the established principles of accounting systems.

The "GHG Accounting and Reporting Principles" are part of the "Corporate Standard" of the GHG Protocol and can be found at:
→ www.bit.ly/ghgprotocol

Transparency

To achieve transparent GHG accounting, the method for determining the GHG inventory must be documented in a clear and understandable manner. All information should be prepared in a factual and coherent manner to ensure understandability in any prospective independent audit. During this process, it is important to disclose the data quality, along with the calculation methods and relevant assumptions used. Furthermore, all conversion factors applied must be recorded and all subsequent changes in entered data or calculation results made transparent.

Relevance

A GHG inventory achieves relevance by providing a realistic representation of a company's overall GHG emissions, thereby enabling internal and external stakeholders to make meaningful decisions. The greatest significance is achieved when companies whose GHG emissions arise primarily from upstream and downstream value chains also weight these emissions accordingly in their reporting.

Completeness

To achieve a complete picture of a company's climate footprint, all GHG emissions must be accounted for along the value chain. In practice, it may well take significant data collection efforts to achieve a complete inventory, as data availability often varies widely. If information is disregarded, left out or missing, this must be justified and documented in a clear and understandable manner. Excluded emission categories should only ever amount to a small proportion of overall emissions. The long-

term goal, however, should be to provide a comprehensive survey of all categories based on high data quality for all sources making up significant proportions of the overall emissions.

Consistency

On the one hand, consistency must be ensured within the GHG inventory through compliance with the defined system boundaries, standards and calculation methods. On the other, time-related consistency is crucial for the GHG inventory to be useful for internal and external stakeholders, as it enables meaningful comparisons of the GHG emissions over several years.

Accuracy

The results of any data collection and calculations regarding GHG emissions come with a degree of uncertainty. However, this overall uncertainty within the GHG inventory should be kept to a minimum by aiming for high data quality, particularly concerning major emission sources. The calculation methodology should neither permit a systematic overestimation nor underestimation of GHG emissions and reduce uncertainties to a practical minimum. A sufficiently precise GHG inventory enables adequate certainty for the derivation of decisions by internal and external stakeholders.

1.2 ANALYZING THE STARTING SITUATION

Analyzing the starting situation is an important and relevant step in the preparation of the GHG inventory. It mainly serves to prevent unnecessary efforts from having to be made during the data collection process. In most companies, systems already exist for the collection of at least some of the relevant activity-related data. For many participants, the effort required to create a GHG inventory means additional work, and this should be kept to a minimum. To this end, data collected within other systems can be used. It is typically advisable to make use of existing structures and processes.

Existing structures

Existing data collection and management systems can facilitate the introduction of GHG management by enabling the immediate use of existing structures, data and processes with very few adjustments. Established contact persons will thus already be familiar with some content-related and organizational aspects of GHG management.

If a company has already established an energy management system, this provides an ideal precondition for initial data collection for a GHG inventory. The quality of data collected in such a system makes it potentially useful for a GHG inventory. Moreover, the system's existing organizational structures and processes can and should be used for GHG management. In contrast to less well-structured methods for energy data collection, an established energy management system is a central business management control instrument and should therefore not be seen as competing with GHG management. While GHG management always considers the impact of the overall corporate activities, energy management systems can be limited to individual company sites. In any case, such existing systems can be of great benefit to GHG management.

Using existing data

While the systematic collection of some data will only be established when GHG management is introduced, much other relevant data may already be recorded and available. It should generally be expected, however, that the respective data does not have the desired quality and most likely does not meet the expected transparency and clarity require-

ments. Meta-information regarding when the data was made available, by whom and from which source, is often missing. This data should still be used for GHG management, even if only as a starting point. Whether energy consumption data has been compiled to monitor the efficiency of production facilities or whether data is being collected regarding truck mileage as part of logistics optimization: All this data can be used for plausibility checks or for calculating parts of the GHG inventory.

Checking the plausibility of data collected from other data stocks is particularly important when setting up the very first GHG inventory. It is therefore advisable to collect the relevant data for at least one year preceding the initial reporting period.

Interdependencies with energy management

Most companies already use some kind of environmental or energy management system today, which can also form the starting point for GHG management. Independently of whether, or according to which standard[1], this management system has been certified (→ ISO 50001, → EMAS or → ISO 14001), the system boundaries of these systems are always focused on individual company sites.

→ www.bit.ly/ISO50001EgyMgmt

→ www.bit.ly/EU-EMAS

→ www.bit.ly/ISO14001EnvMgmt

In contrast to energy management, GHG management focuses on the effects of corporate activities on the climate. This broader scope also includes emissions that the company causes indirectly through its business activities and other processes that emit GHG emissions, e.g., through chemical reactions. Emissions of cooling agents from refrigeration equipment and air-conditioning systems are also taken into account, since refrigerants often strongly contribute to the greenhouse gas effect, even in small quantities. Apart from the actual energy demand, the type of energy production also plays a major role, since energy production from renewable sources causes much lower GHG emissions than conventional production from fossil fuels. Nevertheless, an existing energy management system can serve as a suitable starting point for GHG management by utilizing pre-existing organizational structures, processes and data management systems.

1 A compilation of relevant standards and norms can be found in → Chapter 6.

→ Cf. page 90

STEP 1

Info Box 1: **EMAS**

The → EMAS regulation (EU) no. 1221/2009, which came into effect in September 2017 and is an updated version of the previous regulation, gives companies the opportunity to address GHG management. It also enables them to have their progress confirmed by an external environmental auditor. This new updated version of the EMAS regulation focuses more strongly on the strategic management of energy consumption and environmental impacts. Risks and opportunities relating to climate and environmental protection arising from corporate activities, products and services, will be assessed in a systematic fashion and controlled by establishing a strategy, objectives, measures, operational structures and processes. As part of this approach, the GHG footprint of products and services can be assessed along the value chain. The insights gained from this approach can be used in the context of GHG management for determining and reducing emissions from scopes 1, 2 and 3. In the future, GHG reporting via the EMAS environmental statement must comply with the GHG Protocol.

→ www.bit.ly/EMAS-1221-2009

Together with other aspects of corporate sustainability, GHG management can be integrated into sustainability management, broadening the scope of consideration and enabling a holistic view of the company's activities.

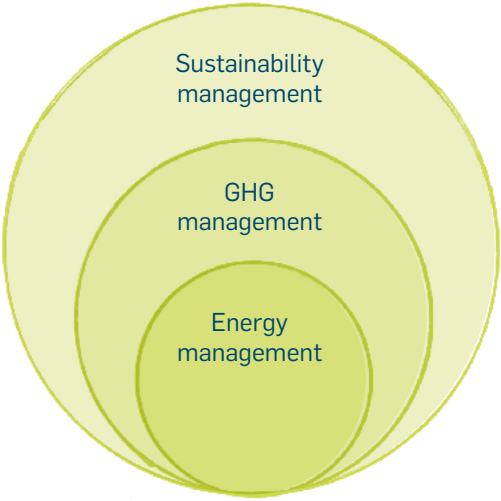


Figure 4: Delineation between GHG, energy and sustainability management.

1.3 SYSTEM BOUNDARIES FOR GHG MANAGEMENT

Climate management first considers those activities occurring in the company's direct or indirect sphere of influence that lead to the emission or reduction of GHGs. Specifically, GHG management thus also deals with all emissions along the value chain, i.e., upstream and downstream activities of service providers, suppliers as well as customers and consumers. Not only does this include emissions from raw materials production and transportation to and from the company, but also downstream processes such as the subsequent processing and use of products made by the company (→ Figure 5).

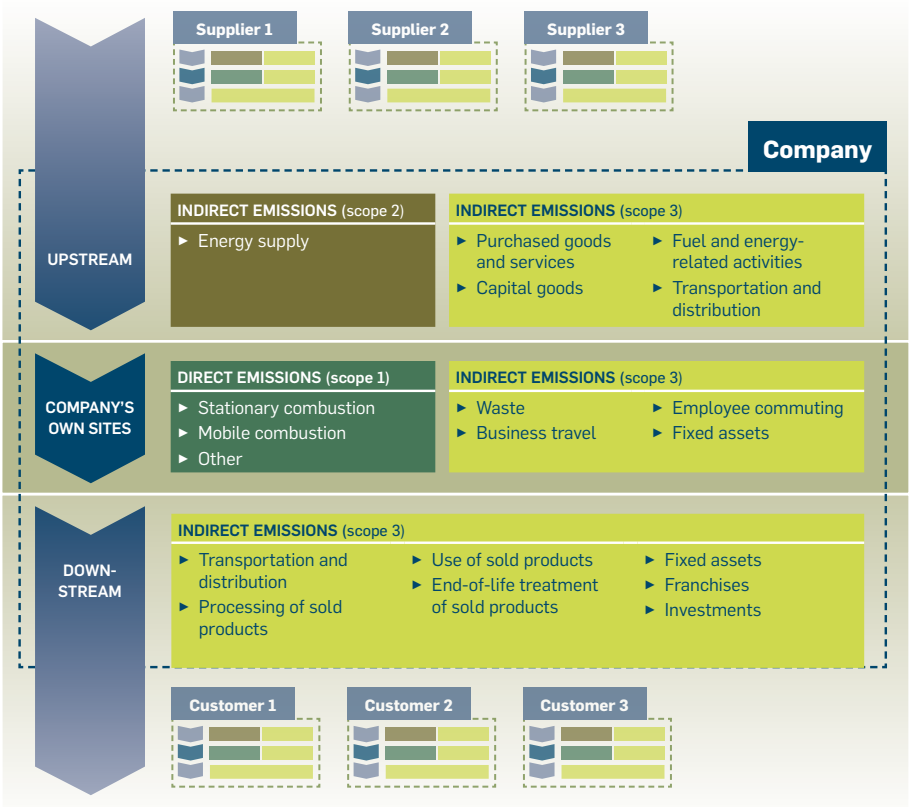


Figure 5: The system boundaries of GHG management encompass the entire value chain.

GHG emissions along the value chain are further subdivided into upstream and downstream emissions. In addition to emissions generated by suppliers of the company (for purchased goods and services, transportation and energy production), some upstream categories can be identified, over which the company has more control, such as emissions from employee commuting, business travel and waste disposal. Downstream processes also contribute to the GHG footprint: In addition to transportation and processing of sold products and services, this particularly includes emissions from their utilization phase.

→ www.bit.ly/ghgprotocol

The GHG Protocol guidelines represent the de facto standard for categorizing GHG emissions. The → Corporate Accounting and Reporting Standard, developed by the World Resources Institute in collaboration with the World Business Council for Sustainable Development, subdivides GHG emissions into different scopes. Scope 1 refers to direct emissions from company processes while scope 2 refers to indirect emissions from energy supplied by other companies (electricity, district heat, steam). These two scopes are clearly defined to prevent double counting direct emissions from different companies. Scope 3 emissions represent scope 1 and scope 2 GHG emissions by other companies and people. Some of these emissions arise within the direct sphere of action of other companies, while the emissions from the utilization phase of a passenger car can also be included in the user's personal GHG footprint.

To better distinguish between the various kinds of activities within scope 3, these emissions are further subdivided into 15 categories (→ Info Box 2). The scope 3 categories are described extensively in the → Corporate Value Chain (Scope 3) Accounting and Reporting Standard using real companies as examples. → "Technical guidance" documents about the individual categories are also provided, with a variety of examples demonstrating how to calculate emissions from all categories. The varying degree of data availability is addressed, too.

→ www.bit.ly/Scope3Calc

→ www.bit.ly/Scope3Calc

The "Corporate Value Chain (Scope 3) Accounting and Reporting Standard" can be downloaded free of charge at:
→ www.bit.ly/Scope3Standard

Info Box 2: **Emission categories for scope 1 to scope 3 emissions**

Scope 1 emissions: Direct emissions from a company's own combustion
- *Category 1:* Stationary combustion
- *Category 2:* Mobile combustion
- *Category 3:* GHG emissions from chemical processes
- *Category 4:* Direct GHG emissions (e.g., leakages)

Scope 2 emissions: Indirect emissions from the acquisition of grid-bound energy
- *Category 1:* Electricity
- *Category 2:* Steam
- *Category 3:* Heating
- *Category 4:* Cooling

Scope 3 emissions: Other indirect emissions from processes that are directly or indirectly caused by the company. These are subdivided into 15 categories:
- *Category 1:* Purchased goods and services
- *Category 2:* Capital goods
- *Category 3:* Fuel- and energy-related activities
- *Category 4:* Transportation and distribution (upstream)
- *Category 5:* Waste generated through operations
- *Category 6:* Business travel
- *Category 7:* Employee commuting
- *Category 8:* Assets the company has rented or leased
- *Category 9:* Transportation and distribution (downstream)
- *Category 10:* Processing of sold products
- *Category 11:* Use of sold products
- *Category 12:* End-of-life treatment of sold products
- *Category 13:* Assets rented out or leased by the company
- *Category 14:* Franchises
- *Category 15:* Investments

Depending on the type of industry, level of in-house production and international structure of a company, the proportion of scope 3 emissions in its GHG inventory can vary greatly. → Figure 6 shows the relative distribution of emissions from different industries between scopes 1 and 2 and the upstream share of the value chain in scope 3. A relevant proportion of overall emissions also arises from the downstream share of the value chain. In particular, GHG emissions from the utilization phase of products and services represent a relevant proportion of many

→ Cf. next page

companies' overall emissions. → Figure 7 shows the emissions distribution of 145 companies from the DACH countries (Germany, Austria, Switzerland) reporting to the → CDP—an NGO initiated by investors. The dominance of emissions from the utilization of sold products should only serve as an indication, however. Due to its unique product or service portfolio, every company has its own individual distribution of emissions in the scope 3 categories.

→ www.cdp.net/en

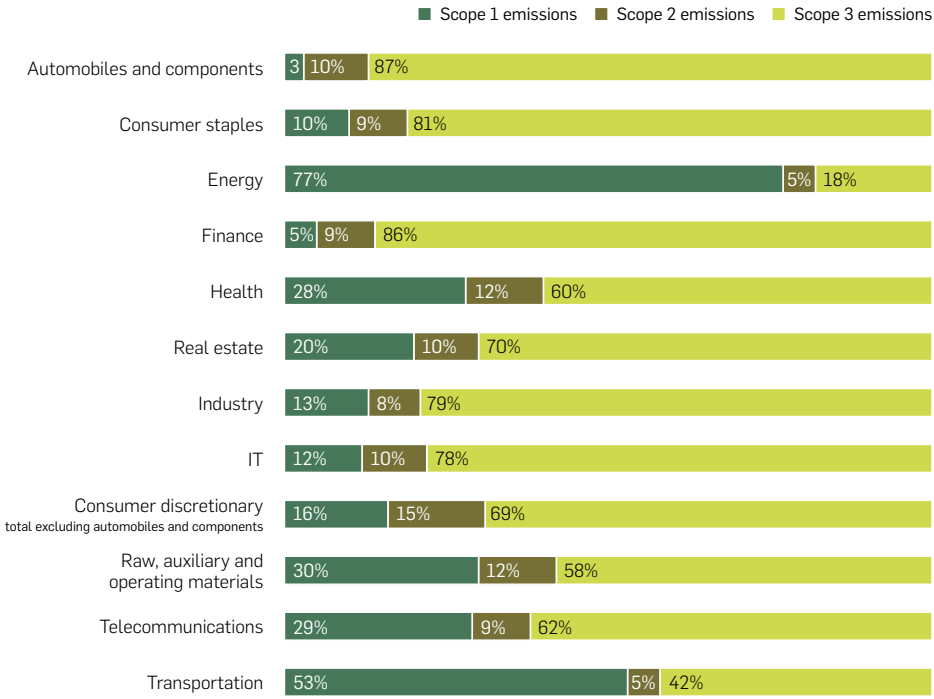


Figure 6: Proportion of scope 3 emissions in the GHG inventory of various industries.

Source: → "Die Zukunft der globalen Wertschöpfung", p. 14, CDP (German version only) Europe/Systain Consulting GmbH, 2014.

→ www.bit.ly/Scope3-study

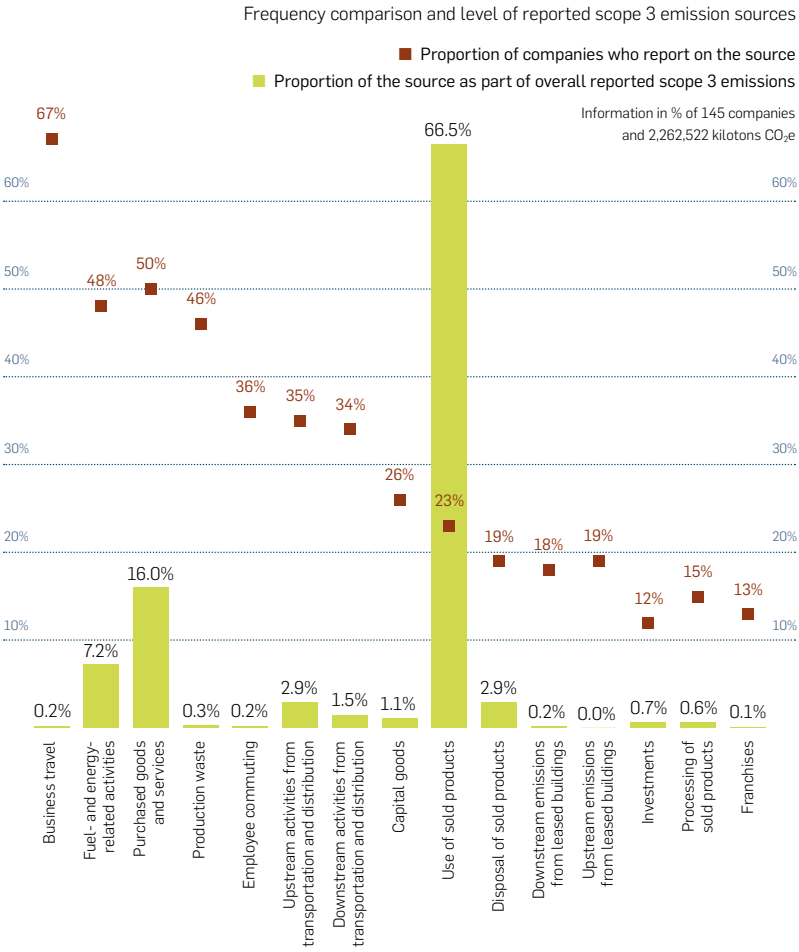


Figure 7: Total GHG emissions from scope 3 categories (CDP).

Source: → "CDP Climate Change Report 2016—DACH 350+ Edition" (German version only), p. 42, CDP Europe/The CO-Firm GmbH, 2016.

→ www.bit.ly/CDP-DACH2016

Ultimately, the specific distribution of emissions between scopes 1, 2 and the various scope 3 categories has a crucial impact on a company's GHG management targets. This distribution plays a decisive role in defining the scope 3 categories considered material to developing the strategy as well as the necessary effort for attaining sufficient data quality. → Section 1.4 provides guidance on the determination of material emission categories.

→ Cf. page 31

Consolidation approaches for defining GHG management system boundaries

To create a meaningful GHG inventory, the organization must first define the boundaries within which it plans on carrying out the accounting. This step is particularly important for large companies with a complex corporate structure, as it enables the company to disclose a conclusive assessment of the overall emissions from all the company's sites and participations. The GHG Protocol suggests various consolidation approaches for this purpose:

Under the "operational control approach", a company accounts for all its GHG emissions at all company sites over which the company has operational control in terms of business policy and strategy. All sites whose cash flow is controlled by the company are accounted for under the "financial control approach", which operates according to a principle very similar to that of the operational control principle. An alternative approach is the "equity share approach", under which a company accounts for GHG emissions from all its sites and participations according to their share of equity in the operation, even if there is no financial or operational control over them.

The choice of consolidation approach strongly depends on the actual corporate structure and quantity of different participations. To attain consistent accounting, the overall company structure must be assessed using the same method. The consolidation approaches are described in more detail in the Corporate Standard of the GHG Protocol and are illustrated with examples.

The "Corporate Standard" of the GHG Protocol serves as a standard guideline for GHG accounting and can be downloaded free of charge at: → www.bit.ly/ghgprotocol

1.4 MATERIALITY

Corporate climate action is typically the result of a materiality analysis that underlines climate protection as an essential company concern, in addition to other aspects of corporate sustainability. Which emission categories are considered material to establishing a complete overview of a company's GHG emissions differs from company to company and is, therefore, subject to each company's own materiality analysis.

In any case, scope 1 and scope 2 emission data must be assessed and form the core of the GHG inventory. It is recommended to apply the Pareto principle ("80/20 rule") when first carrying out the data collection. At least 80 percent of the company's total scope 1 and 2 emissions should be covered. An increase of this coverage should be aimed for with yearly updates of the GHG inventory. To this end, an ongoing analysis of the company-specific emission categories for scope 1, 2 and 3 emissions is recommended.

Most companies' scope 3 emissions tend to be much higher than the respective scope 1 and 2 emissions and therefore material to the validity of the GHG inventory and GHG management targets. The question of materiality is thus particularly relevant for emissions in scope 3.

Dr. Jury Witschnig, BMW Group, Corporate Planning and Product Strategy Sustainability and Environmental Protection

"For scope 3 emissions, we focus on the following two key areas: product use phase and purchased goods and services. This is where we see the greatest shifts and opportunities arising from new electromobility solutions in the future."

Whether an emission category should be considered material to the GHG inventory is largely determined by the following factors:

- Proportion of the emissions in a category as part of overall emissions
- Influenceability
- Stakeholders' interest and expectations
- Relevance for risk management
- Degree of outsourcing

The result of a materiality analysis for a GHG inventory can strongly deviate from the materiality of individual steps in the value chain regarding other aspects of corporate responsibility (e.g., social responsibility, resource conservation, etc.). →Figure 8 shows that the subjective evaluation of relevance of many emission categories is largely dominated by factors other than the actual emission level. While over 50 percent of companies (out of 350 stocklisted companies within the DACH countries) include "business travel" in their reporting and just as many believe emissions from business travel to be a relevant category, less than one percent of scope 3 emissions actually fall under this category on average.

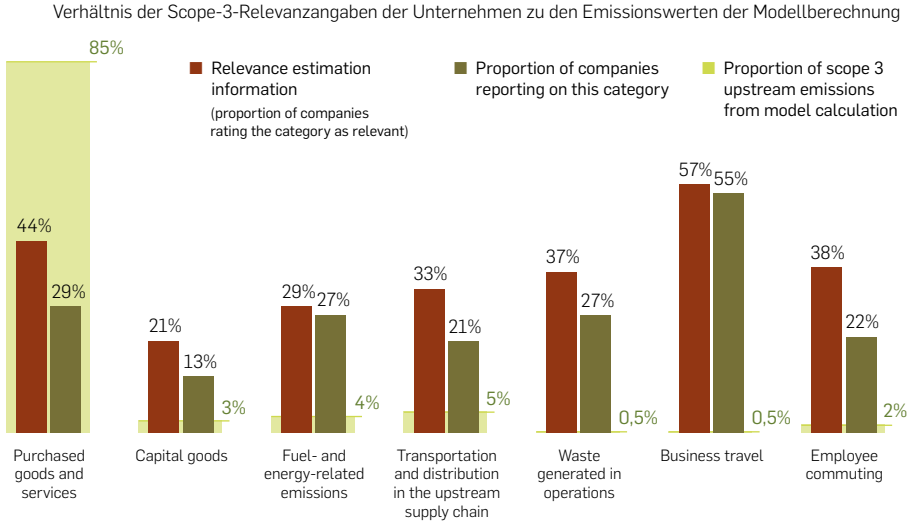


Figure 8: Estimated emission levels of scope 3 emissions from the upstream value chain and estimation of their relevance by sustain and CDP.

Source: →"Die Zukunft der globalen Wertschöpfung" (German version only), p. 17, CDP Europe/Sustain Consulting GmbH, 2014.

→ www.bit.ly/CDP-Sustain-Scope3

An examination of the materiality of individual emission categories and sources should therefore be carried out in collaboration with the contact persons from the different company sites and relevant departments who can provide information on activity data. The levels of GHG emissions in each category are among the most important inputs for determining material emission categories and sources. Calculating GHG emissions from activity data requires knowledge of the emission intensity of the processes in question. To also correctly account for the system boundaries and calculation methodologies chosen, it is recommended to call upon an internal or external expert to support the materiality analysis.

A first estimation of expected GHG emissions in scope 3 can be supplied by the "Scope 3 Evaluator", which resulted from a collaboration between the GHG Protocol and Quantis: → www.bit.ly/Scope3Evaluator

Considering the aforementioned aspects, it will therefore prove useful to carry out a workshop with the relevant stakeholders regarding the materiality analysis for the GHG inventory. The workshop should be designed to achieve the greatest possible GHG reporting relevance. It should also maximize the usefulness of the GHG inventory against the backdrop of the often considerable effort required to collect the necessary data for each emission category.

For manufacturing companies, it may therefore be helpful to exclude purely administrative company sites from considerations in a first step. This approach should, however, be adjusted over time to meet completeness and transparency requirements and comply with the Corporate Standard of the GHG Protocol.

1.5 DATA AVAILABILITY

Activity data serves as the foundation for establishing a GHG inventory. However, data availability for the various emission categories can vary widely and is not typically a simple matter of whether it is or is not available. Rather, the crucial issue is the quality of the data. Since the goal is to achieve as precise an outcome as possible, primary data such as fuel consumption or GHG emissions from a company's suppliers and customers is always preferable to secondary data from models or rough estimates. Even if a company's GHG inventory has already been assessed,

there may still be areas where improved data quality can increase the validity of the inventory. Especially for scope 3 emissions, alternative sources and calculation methods can impact data quality to a major extent.

The GHG Protocol "Corporate Accounting and Reporting Standard" provides a set of requirements and guidance for companies and other organizations preparing a corporate-level GHG emissions inventory:
→ www.bit.ly/ghgprotocol (available in 8 languages)

The GHG Protocol's "Technical Guidance for Calculating Scope 3 Emissions" gives guidance for practical data collection for each category of emissions:
→ www.bit.ly/ghgp-guidance

→ Cf. page 37

For further information regarding the published documents by the GHG Protocol, please see → Info Box 3.

The *EPA Center for Corporate Climate Leadership* has developed specific GHG guidelines to extend and build upon the GHG Protocol, to adhere more closely to EPA-specific GHG calculation methodologies and emission factors, and to support the Center's GHG management tools and its Climate Leadership Awards initiative:
→ www.bit.ly/EPAClimateLeadership

EPA *Simplified GHG Emissions Calculator*
→ www.bit.ly/EPAEmissionsCalculator

Emissions in scopes 1 and 2 can typically be assessed with good precision from primary data (e.g., meter readings, invoice documents, filling levels, etc.). Within scope 3, the availability and data quality of primary data from the various categories can vary considerably. The data collection effort becomes particularly extensive in categories with poor data availability.

→ www.bit.ly/DGCN-DiscussionPaperS3K1

In order to assess emissions from data regarding purchased goods and services (→ scope 3, category 1), the total weight of the materials purchased by the company must be known. The purchasing department can provide invoice documents from which at least part of the weight can be quite easily calculated. Depending on the nature of the purchased materials, company suppliers can also be asked to provide the respective information. Together with the relevant emission factors for product manufacturing, GHG emissions can then be calculated.

Data regarding emissions from the manufacture of capital goods, including machinery, real estate and vehicles, is typically less readily available (scope 3, category 2). If the manufacturer cannot supply the relevant

GHG information for these products, rough calculations must suffice, based on simplified assumptions about weights and materials. In this case, the production process is to be ignored.

GHG emissions arising from the transportation of materials (→ scope 3, category 4) can be assessed using detailed information supplied by logistics service providers. Ideally, access should be granted to information about all delivery trips including the mode of transportation, distance and transported weights. Alternatively, the average transportation distance can be estimated, and the same weights as those already used for category 1 can be applied. GHG emissions from customer-bound transportation that the company does not pay for must be accounted for in the company's corporate carbon footprint (CCF) under category 9. As the company itself does not commission the service provider for such trips, data availability tends to be quite poor, and the distances can only be estimated. In terms of products that are manufactured for end-consumers in particular, meaningful assumptions must be made in the context of choosing emission factors regarding the transportation of products on the final distance to their destination (e.g., passenger car instead of truck).

→ www.bit.ly/DGCN Discussion PaperS3K4a9

The discussion papers feature a compact summary of empirical values and content from workshops and webinars of the Peer Learning Group Climate of the Global Compact Network Germany:

"Scope 3.1—Practical guidelines for data collection and calculation of greenhouse gas emissions from purchased goods and services"
→ www.bit.ly/DGCNDiscussionPaperS3K1

"Scope 3.4 / 3.9—Practical guidelines for data collection and calculation of greenhouse gas emissions from upstream and downstream transportation and distribution" → www.bit.ly/DGCNDiscussionPaperS3K4a9

A large portion of emissions in a company's GHG inventory can arise from the further processing or use of a company's products (scope 3, category 11). This is true both for products whose use implies energy consumption (e.g., electrical devices) as well as for products whose processing or use leads to other GHG emissions (e.g., energy consumption for heating up plastic granulate). To assess these GHG emissions, one option is to make in-house calculations based on key consumption figures. A second option is for the company to make assumptions or attain information about its customers' activities regarding the further processing of the company's products.

In any case, it is important for a company to make a significant effort to establish scope 3 emissions to the best of its ability, even if there is no primary data available from its suppliers and customers regarding individual emission categories. Particularly during the preliminary phase, it is highly likely that a company will have to use secondary data or estimates. However, the use of primary data for the very first GHG inventory tends not to be necessary. To assess data expediently, it is crucial to have a sufficient collection of precise data within the categories that the company has identified as material, e.g., due to their influenceability. For all other categories, it is often sufficient to get an idea of their magnitude. Several support tools exist for assessing scope 3 emissions:

→ www.bit.ly/Scope3Standard

The → Corporate Value Chain Standard along with the various scope 3 → technical guidance documents often contain different calculation methods, many of which work with secondary data and estimates. All estimates and assumptions should be interpreted conservatively.

→ www.bit.ly/Scope3Calc

> The technical guidance documents for individual scope 3 categories can be downloaded free of charge at:
> → www.bit.ly/Scope3Calc

For emissions from category 1, "Purchased goods and services", a proxy estimate can also be based on financial key figures. The Economic Input-Output Life Cycle Assessment (EIO-LCA) is a tool available for such estimates. It assesses GHG emissions based on purchase volumes by industrial sector. However, a GHG inventory based on this approach should only ever be considered provisional.

> The *Economic Input-Output Life Cycle Assessment* (EIO-LCA) can be used to assess emission factors for scope 3 emissions, categories 1 and 2. Before being used, the results should be adjusted for inflation. The tool and instructions on how to use it are available online at:
> → www.bit.ly/EIO-LCA

This kind of estimate serves to assess the relevance of different scope 3 categories for a company's very first GHG inventory. A company should aim for a higher quality of data in categories where preliminary estimates indicate a significant proportion of overall emissions or those considered material for other reasons (e.g., stakeholder expectations, influenceability, relevance for risk management). It is important to use primary data to calculate scope 3 emissions when examining qualitative changes within individual categories (e.g., CO_2 reduction targets for suppliers, the development of a new product or qualitative changes in employees'

commuting behavior due to car sharing or company-subsidized public transport tickets). It is only by assessing such changes based on reliable data that a company can determine the success of the measures.

Info Box 3:
Published GHG Protocol documents to support calculation in scopes 1 to 3

The World Resources Institute and the World Business Council for Sustainable Development have collaborated to create a variety of now internationally accepted and well-known standards, guidance documents and tools to help companies and cities calculate, report and manage their GHG emissions.

1. **Relevant documents for use by companies in calculating emissions from scopes 1 to 3**
   - The *Corporate Standard* is the most widely used standard for corporate carbon footprinting, including all direct and indirect emissions →🌐 www.bit.ly/CorporateStandard
   - Additional guidance on calculating and reporting scope 2 emissions can be found in the *Scope 2 Guidance*: →🌐 www.bit.ly/Scope2Guidance
   - The *Corporate Value Chain Standard* focuses on methods and guidance for calculating and evaluating scope 3 emissions: →🌐 www.bit.ly/CorporateValueChain
   - Guidance for the agricultural sector, intended for use by companies and governmental organizations: →🌐 www.bit.ly/AgricultureGuidance
2. **Relevant reporting standard for cities:** →🌐 www.bit.ly/GHGProtocolCities
3. **Additional standards including the GHG Protocol on product life cycle emissions:** →🌐 www.bit.ly/ProductStandard

All standards are available in English and several other languages:

- The *Corporate Standard* is available in multiple languages, including Chinese, Japanese, Korean, Portuguese, Spanish and French.
- The GHG Protocol for cities is also available in Spanish.

1.6 CALCULATION AND EMISSION FACTORS

As GHG emissions tend not to be measured but calculated from other activity data, conversion factors must be used. While conversion factors are often easily and reliably available for physical properties of materials (such as density or the heating value of a fuel), selecting emission factors for GHGs tends to be more complex.

Different system boundaries for emission factors

Differences between factors typically arise from deviating assumptions in their modeling. Furthermore, emission factors with different system boundaries often exist, and can be used for different purposes. In order to apply the right factors to calculations in different areas of the GHG inventory, the aspects elaborated in the following chapters will be relevant.

Which GHGs do emission factors account for?

Many emission factors only account for carbon dioxide (CO_2). Although CO_2 is responsible for the largest share of the anthropogenic greenhouse effect, other GHGs must also be considered for the sake of completeness and precision of the GHG inventory. Taking into account the other GHGs tends to increase certain factors only by a few percentage points. Individual processes, however, can have a rather significant impact on the greenhouse effect through other GHGs. Methane and nitrogen oxides, for example, play a particularly important role in agricultural processes, while fluorinated hydrocarbons (PFCs/HFCs) can make up a considerable share of overall emissions in the area of air conditioning and refrigeration.

In addition, not all emission factors take into account the biogenic proportion of GHG emissions. The distinction becomes particularly relevant when there is significant fuel consumption, as biofuels are added to conventional fuels in many contries and regions. According to the GHG Protocol guidelines, GHG emissions from biogenic sources must be disclosed separately in the GHG inventory.

GHG emissions from combustion

In scope 1 and 2 emissions of the GHG inventory arising from combustion, only direct emissions from the combustion process must be considered. While upstream activities (such as the production and transportation of combustibles and fuels or emissions from building and maintaining power plants) do cause emissions, these should not be included in scopes 1 and 2. The scope 3 category "Fuel- and energy-related activities" includes these emissions by accounting for emissions from the production, refining and transportation of fossil fuels. In addition, the GHG emissions for the increased production of electricity and district heat due to transmission and distribution losses are included in this category. When it comes to fuels, terms such as "well-to-tank" (WTT) for emissions resulting from the production and transportation of the fuel, and "well-to-wheel" (WTW) for emission factors including both production and transportation as well as the emissions resulting from the actual combustion, are used.

GHG emissions arising from production and disposal

GHG emissions resulting from the production of materials used by the company are to be included in the scope 3 category "Purchased goods and services" (excluding emissions from the production of fuels and grid-bound energy). Most emission factors available on purchased goods cover GHG emissions from "cradle-to-gate" (CTG) of the manufacturer and are thus suited for this category. To account for the complete life cycle of such purchased goods, however, their transportation and disposal must also be accounted for based on the relevant emission factors (scope 3, transportation and distribution, and where applicable, use of sold products and end-of-life treatment of sold products).

Such lifecycle analyzes are increasingly becoming available for materials and products. In addition to emissions from the production of materials and products, emissions from their utilization phase and disposal are also taken into account. The CTG system boundary enables a more holistic view of GHG emissions arising from the use of these goods and products. Allocating them to different scope 3 categories is then, however, only possible if detailed information about the distribution between individual life cycle phases (production, utilization and end-of-life) is available.

Sources for conversion and emission factors

→ Cf. definition of terms, page 7 f.

The availability of appropriate → conversion and emission factors for relevant activities in the company's sphere of action can impact the validity of the GHG inventory. For emissions in scopes 1 and 2, the quality and availability of emission factors tends to be very good. In scope 3, however, not all necessary factors tend to be readily and reliably available. To meet the consistency requirement, a uniform source should be used for GHG emissions from the same category wherever possible.

The emission factors used by the Intergovernmental Panel on Climate Change (IPCC) are publically available in a searchable database (advanced knowledge is required for use) at: → www.bit.ly/EFDBemissionfactors

The International Energy Agency (IEA) makes emission factors available for energy generation from fossil fuels from OECD countries as well as over 100 non-OECD countries. They are updated on a regular basis and can be used for a license fee at: → www.bit.ly/IEA-Emissions

The British Department for Business, Energy and Industrial Strategy publishes updated emission factors for a very broad range of corporate processes on an annual basis, available at: → www.bit.ly/FactorsUK

Emission factors for larger-scale fuel use (e.g., coal, lignite) can be found in a publication by the German Federal Environmental Agency: → www.bit.ly/FossilFuelsEmissions

The German Association of the Automotive Industry (VDA) publishes factors representing the GHG emissions of energy generation in EU countries and other economically strong countries. A distinction is made between individual GHGs and biogenic and fossil CO_2. The factors can be obtained as an Excel sheet for under 100 euros (German only) at: → www.bit.ly/VDA-EF

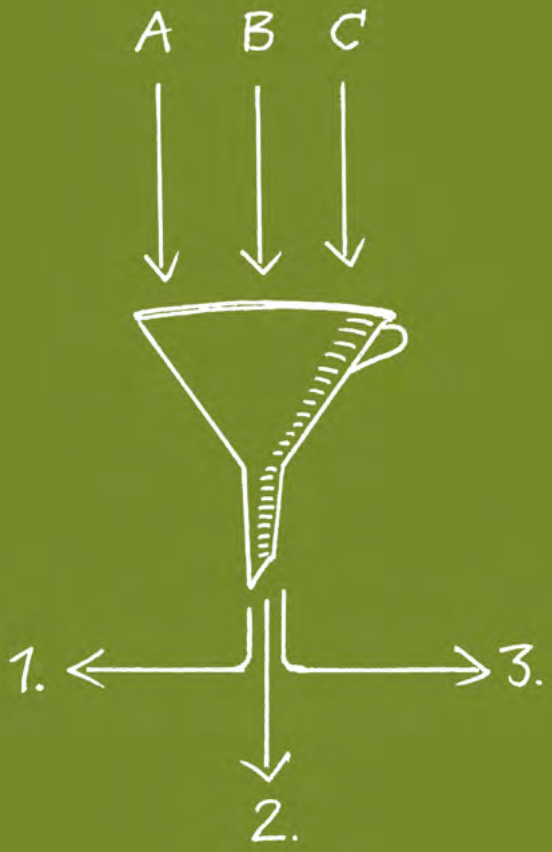
1.7 CALCULATING GHG EMISSIONS

The term "Activity data" here refers to information about activities associated with GHG emissions. This also includes, besides the consumption of fuel, electricity and other purchased energy or goods, information about purchased services. Calculation always follows the same principle, in which activity data enables the calculation of GHG emission levels.

Activity data	×	GHG emission factor	=	GHG emissions
Example for scope 1				
Amount of diesel consumed by company trucks	×	GHG emission factor for diesel combustion	=	GHG emissions from diesel combustion in company's own trucks
100,000 l	×	3.14 kg CO_2e/l	=	314 t CO_2e
Example for scope 2				
Amount of plastic purchased	×	GHG emission factor for the production of plastic	=	GHG emissions from the production of purchased plastic
10,000 kg	×	5 kg CO_2e/kg	=	50 t CO_2e

For small- and medium-sized businesses that have, for instance, one production site and one administration site, the required calculation data for creating the GHG inventory tends to be manageable for one person. However, if the company operates multiple sites in different countries, all of which provide the GHG basis for the overall company, it is advisable to introduce and integrate data and process management to establish structures and ensure that uniform and consistent GHG management data is available.

STEP 2: INTRODUCING DATA AND PROCESS MANAGEMENT



Many companies have already prepared a GHG inventory before becoming more intensively involved with GHG management. These companies tend to have an overview of the distribution of emissions along the various scopes and categories. However, it is only in the context of introducing a systematic approach to GHG management that such companies tend to begin devoting serious thought to structuring this data and its collection.

The ultimate goal of **structured data collection** is to make GHG management more efficient. Although overall, this leads to a larger quantity of collected data, a structured approach and greater transparency will greatly facilitate the process in the long run. This makes a sound data and process management system indispensable for successful GHG management.

This second step is aimed at laying the foundation for the consolidation of GHG management processes in daily operations by selecting and developing a suitable **data collection system and process**.

2.1 INTRODUCING A CORPORATE RESPONSIBILITY SOFTWARE SOLUTION

The primary goal of the data collection is to capture all activity data and calculation results in one central location to enable GHG emissions to be analyzed. A growing number of data collection software solutions suitable for GHG accounting management are available today. The use of a corporate responsibility (CR) software solution can prove particularly beneficial for companies exceeding a certain size and complexity. The software solutions listed in → Info Box 4 are all fee-based offerings, some of which are available in several languages.

For various reasons, the use of a software solution is not an option for many companies. Many providers save the data on external servers, thus raising data protection concerns. In addition, the introduction of new software, particularly for large companies, often involves extensive preconditions having to be met and checks carried out by the corporate IT department. This can prove to be a major obstacle to the company-wide introduction of a new software solution.

True added value for GHG management can be provided by integrating the necessary data collection process into existing corporate IT systems. This prevents the repeated collection of the same data. At the same time, existing systems, such as those used for collecting financial key indicators, tend to provide quite an accurate representation of the company structure and tier 1 supplier.

Whether corporate data management is conducted by means of a software solution available on the market or some other solution, certain preconditions for successful data management must be met in any case. The following section details the most essential elements involved in making data management successful for the long run.

Info Box 4: **CR software solutions for GHG emissions data management**

Provider	Tool	Link	Country
Accuvio	Energy & Carbon	→🌐 www.bit.ly/accuvio	IE
ADEC	MetricsTrac	→🌐 www.bit.ly/MetricsTrac	US
CarbonTrust	Footprint Manager	→🌐 www.bit.ly/CarbonFootprinting	UK
CarbonView	Sustainability Reporting	→🌐 www.bit.ly/CarbonView	AU
cii	Sustainability Data Management	→🌐 www.bit.ly/CGControlling	DE
Cloudapps	Energy & Carbon Management	→🌐 www.bit.ly/sustainabilitycloudapps	UK
CSRware	Environmental Sustainability Management Software	→🌐 www.bit.ly/CSRware	US
Dakota Software	Greenhouse Gas and Energy Application	→🌐 www.bit.ly/dakotasoft	US
EcoMetrica	Carbon/GHG	→🌐 www.bit.ly/ecometricaSustainability	UK
EcoPortal	Environmental Software	→🌐 www.bit.ly/ecoportalManagement	NZ
ecova	Carbon Management	→🌐 www.bit.ly/ecova	US
Enablon	GHG Software	→🌐 www.bit.ly/EnablonGHG	FR
EnergyDeck	EnergyDeck Platform	→🌐 www.bit.ly/EnergyDeckPlatform	UK
FigBytes	Carbon Module™	→🌐 www.bit.ly/FigBytes	CA
Footprint Foundation	Enterprise Carbon Accounting	→🌐 www.bit.ly/FoundationFootprint	NZ
GreenIntelli	Carbon Management & Reporting	→🌐 www.bit.ly/GreenIntelli	US
Greenstone	Environment	→🌐 www.bit.ly/GreenstonePlus	UK
Intelex	Air Emissions Management	→🌐 www.bit.ly/Intelex	CA
ISOmetrix	Environmental & Social Sustainability	→🌐 www.bit.ly/IsoMetrix	AU
Isystain	Energy & Carbon	→🌐 www.bit.ly/iSystain-carbon-and-energy	AU
SAP	Sustainability Performance Management	→🌐 www.bit.ly/SAPsustainabilitysoftware	DE
SupplyShift		→🌐 www.bit.ly/SupplyShift	US
ThinkStep	SoFi	→🌐 www.bit.ly/SOFIsustainability	DE
Turnkey Solutions		→🌐 www.bit.ly/TurnkeySolution	HK
UL (former CR360)	PURE sustainability	→🌐 www.bit.ly/UL-EHS	US
WeSustain	WeCarbon	→🌐 www.bit.ly/wesustain	DE

2.2 DATA COLLECTION AND MANAGEMENT

Activity data

Corporate emissions are assessed on the basis of activity data in combination with previously determined emission factors. To attain information that is as consistent as possible from all data managers, a definition and description of each key figure and queried indicator must be developed, and must be as precise as possible. In many cases, terms such as "energy consumption" are no longer precise enough, for instance when a distinction must be made between external energy purchasing and internal energy consumption through in-house generation. When defining the key indicators, therefore, special cases should be taken into account in order to ensure a uniform understanding of them. In any case, these descriptions should be clearly displayed during the data entry. Detailed descriptions that need to be looked up from other sources tend to be ignored.

Time period

Most data are typically collected on a per-year basis. In such cases, the time period for the data being entered has been pre-defined. In the context of integrated accounting, however, monthly or quarterly data entry can be considered as well. A higher time resolution can serve to reveal, for example, seasonal or weather-related developments. Some CR software solutions enable the user to easily switch between different entry options. Some of them can even project activity data for the rest of the year.

Information regarding the data entry person and data manager

If questions about the information arise or corrections need to be made at a later date, it is important that they can be managed efficiently. Therefore, the name of the person who entered the data as well as the time of the data entry should be recorded. This approach provides better transparency and has the potential to save a great deal of time and unnecessary research in the case of a data audit. Most CR software solutions automatically capture the relevant information through integrated user management.

During the data collection process, retrospective activity data changes, carried out by a person exterior to the usual data collection logic (e.g., an external auditor) may occur. Many CR software solutions therefore

also register changes made to an entry. This enables the best possible traceability both for the auditor and the company employees.

Data quality indicator

The data quality of all information should be recorded during the data collection process to enable the validity of the results to be evaluated. In particular, estimates and preliminary data must always be marked as such. Special CR software solutions also enable information to be provided as a range of values and indicate the resulting uncertainty as part of the analysis.

Data sources

Much of the relevant activity data is obtained from supporting documents (e.g., invoices, delivery notes, measurement reports) or taken over from existing systems (e.g., SAP systems or plant control system software). Specific information about data sources significantly increases transparency and ensures traceability of the data (→ Chapter 6) for data sources of scope 3 categories). In the case of invoice documents, this also includes the invoice number and date, for example. When data is taken over from existing systems, evaluation parameters, such as the chosen time period and other settings, should also be provided. The majority of CR software solutions allow for original documents to be attached as files. Some solutions also enable automated data collection from an SAP or other system through an IT interface.

→ Cf. page 92

Free text

It is important to ensure the possibility of leaving a free text comment on all information. This free text comment can, for example, be used to explain deviations from the previous year, thus facilitating the subsequent plausibility check and reporting.

Care must be taken to ensure that all data and meta-information is captured together. Information concerning the data entry person and the quality and sources of the data should be retrieved in direct connection with the activity data. If CR software is not being used for the data collection, questionnaires must be relied upon for the data collection. These can be generated, for instance, using a spreadsheet application and should be designed to enable automated and meaningful feedback during data entry if additional information is missing.

Automatic consolidation

During a data collection process based on a spreadsheet application in particular, the process of regularly consolidating substantial amounts of data can become very complex. In such a process, manual consolidation is a typical source of error. The goal is to use a suitable data structure to minimize this. Ideally, an automatic consolidation function ought to be planned to be included as early as in the respective system development phase.

Recalculation guidelines

A company's GHG inventory can be subject to irregular changes, e.g., through the acquisition of company sites or divestment of subsidiaries. If, for instance, a site is divested from a company, the respective data and emissions will also need to be retroactively removed from the GHG inventories. Equally, the acquisition of a new subsidiary leads to emissions partly becoming integrated into the company's GHG inventory.

→ Cf. page 40

Updating → conversion and emission factors can also require updating the GHG inventory. Due to continuous change in the electricity mix, many organizations update their information on emission factors annually. As these updates typically only occur some months or years later, the GHG inventory can only be adjusted retrospectively.

It is advisable in any case that internal corporate guidelines be created to describe when a recalculation becomes necessary. It is important to establish a significance threshold as part of this process, below which a recalculation can be foregone.

The "Tracking Emissions Over Time" chapter of the "Corporate Standard" describes necessary adjustments to the GHG inventory in the case of structural changes in the company: → www.bit.ly/ghgprotocol

2.3 PROCESS MANAGEMENT

Four-eyes principle checks

To prevent simple errors from being overlooked and becoming part of the GHG inventory, at least one other person should always double-check all information. Such a review can be conducted on various levels. A four-eyes principle check should definitely take place with regard to company sites, i.e., a second person should check the entered information for validity and plausibility. Further checks include plausibility on the level of business areas and the overall company. Data concerning company-wide activities should be reviewed by employees from the same department.

CR software solutions can support this review process by informing data managers when a four-eyes principle check reveals negative results, and that the data entry must be repeated. After a successful review of all information, an automatic notification can also be sent to the climate change officer to enable subsequent analyzes and the compilation of reports.

Project schedule with multiple participants

To ensure smooth data management, a project schedule should be developed beforehand, including all participants and deadlines. In this schedule, the reporting period is often identical to the calendar year, i.e., the consolidation of most information occurs at the beginning of the following year. → Figure 9 shows an example of a project schedule which can be used to create a company's detailed and adjusted version. Some CR software solutions integrate deadlines into the project schedule via input masks and, for example, enable automatic e-mail reminders and status reports to be sent to the respective persons.

→ Cf. next page

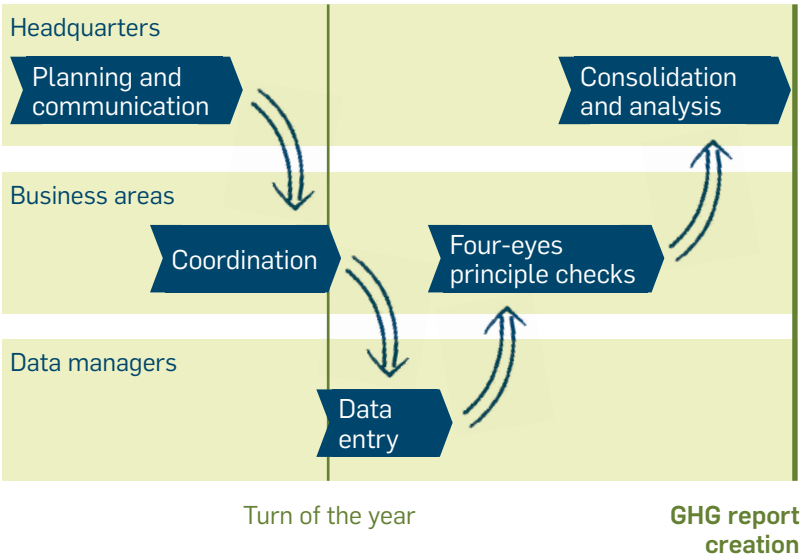
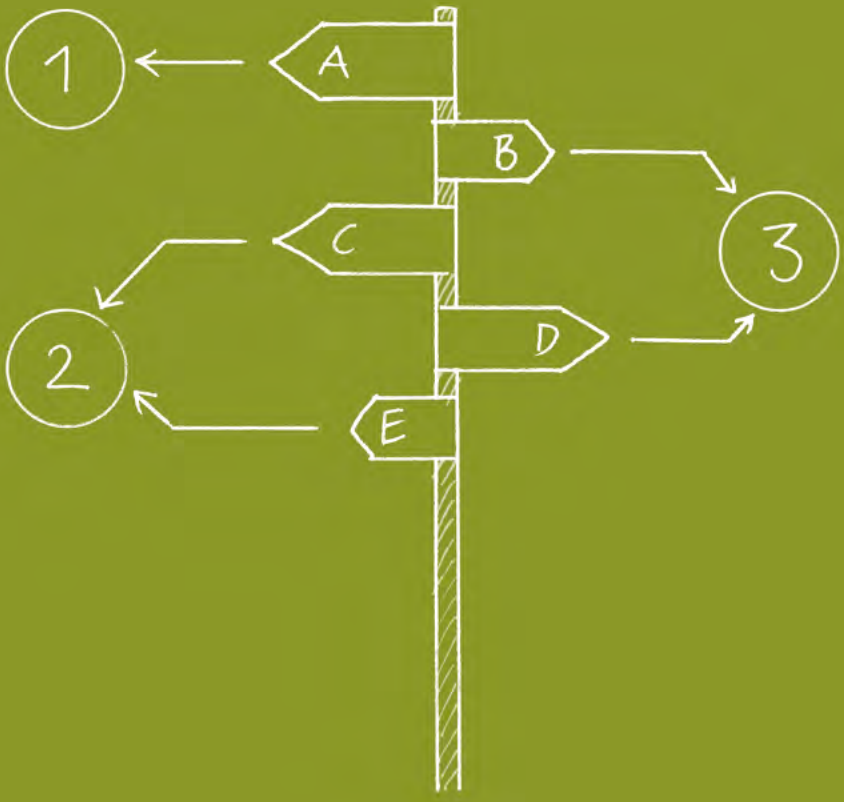


Figure 9: Exemplary project schedule.

Whether or not a software solution is being used, it is advisable to define clear procedural instructions for all steps and processes for the sake of transparency and traceability. The roles of all involved persons should be compiled in a central document with a description of their responsibilities within the various GHG management processes. The instructions should not be limited to the various sites of the company but also take into account the data collected from the scope 3 categories. This documentation will help create transparent instructions for all participants, ensuring a clear and consistent process for subsequent years as well.

STEP 3: DEVELOPING A CORPORATE CLIMATE STRATEGY



The development and laying down of a corporate climate strategy is the **central element** of introducing corporate climate action, as it creates a context in which the ambitions of a company can become measurable and comparable.

A climate strategy necessarily builds upon a GHG inventory that brings together all relevant emission sources of a company. Setting a **long-term GHG emission target** that will extend 10 or more years into the future is a suitable next step.

The development of a climate strategy is concluded when the strategy is **formulated and published**. Each company sets its own individual climate target and is subject to the particular circumstances of its respective sector. Therefore, a climate strategy naturally differs from company to company.

3.1 ANALYSIS OF EMISSION CATEGORIES AND SOURCES

→ Cf. page 18 ff.

During the preparation of the GHG inventory (→ Step 1), the following items have typically already been dealt with: the materiality of GHG emissions, the proportion of scope 1 and 2 emissions as part of the overall emissions, and some relevant scope 3 emissions. The company-specific system boundaries have therefore already been defined. In order to enable the adoption of a climate target, which should be as ambitious as possible while also realistically achievable for the company, it is strongly recommended to first analyze, evaluate, and prioritize emission categories and sources.

The evaluation and prioritization should be based on emission sources allocated to one of the emission categories from scopes 1, 2 or 3. The terms "emission category" and "emission source" are often used interchangeably. In the following, individual emitters whose emissions can be assessed, e.g., based on meter readings or other activity data, will be called "emission sources." Individual emission sources are then, in turn, grouped into emission categories. → Figure 10 shows an example of the hierarchy of emission sources, categories and scopes.

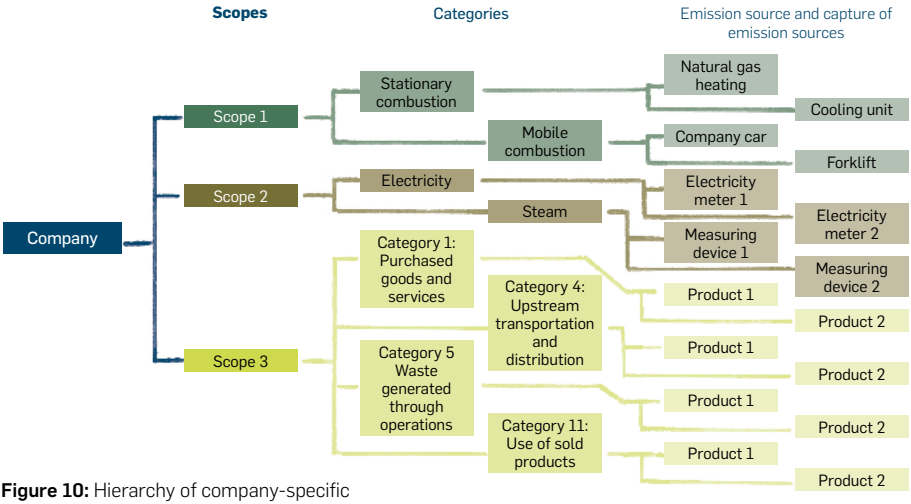


Figure 10: Hierarchy of company-specific emission categories and sources.

A decisive step for deriving a climate target is the evaluation and prioritization of all relevant emission categories and sources based on the following criteria:

1. **Emission level:** Relative emission proportion of total company emissions, dependent on the relevant scope or relevant categories included in the boundary
2. **Abatement potential:** Opportunities for reducing emission level
3. **Influenceability** of emission source and category
4. **Interests** of internal and external **stakeholders**
5. **Interdependencies** and **displacement effects of GHG emissions**

Emission sources should also be evaluated by taking into account the time period that is relevant for the company's climate target. On the one hand, emissions from individual categories may increase or decrease due to economic factors (e.g., growth, consolidation). On the other hand, influenceability, reduction potentials and the interests of stakeholders in individual emission categories can vary greatly over the course of just a few years due to the dissemination of new technologies, such as vehicle electrification.

In addition, the following questions should guide the action necessary for the prioritization of categories: Can the company-specific system boundary, which so far only entails scopes 1 and 2 emissions, also entail scope 3 categories in order to progressively include emissions from the value chain? Can the coverage of scopes 1 and 2, or even scope 3 emissions considered so far be increased by taking into account additional emission sources and categories for GHG accounting in the future?

1) Emission level

First of all, the level of individual emission sources (t CO_2e or kg CO_2e, → Chapter 1.7 for the calculation method) should be assessed. Emission sources should then be arranged within the emission categories according to their levels. The following examples show the potential results of evaluating and prioritizing emission hotspots (→ Definition of terms):

→ Cf. page 41

→ Cf. page 7

- Example 1: For a company in the machine construction and civil engineering industry, the emission hotspot lies in scope 2 as well as in upstream and downstream scope 3 emissions (particularly during the use phase). Scope 1 emissions play a subordinate role.

- Example 2: For a logistics service provider with its own vehicle fleet, the hotspot can be found in scope 1 emissions as well as in upstream scope 3 emissions, such as emissions generated during the production of the fleet.

- Example 3: For a company from the printing sector, emission hotspots are found in scopes 1 and 2 as well as in upstream scope 3 emissions, with downstream scope 3 emissions being less relevant.

- Example 4: For a trading company, department store or travel agents, the emission hotspot lies in upstream scope 3 emissions, particularly on the "Purchased goods and services" category. Scope 2 emissions play a subordinate role, yet should always be included as an emission hotspot (→ Definition of terms).

→ Cf. page 7 ff.

- Example 5: For a company from the textile industry, the emission hotspot is found in scope 3 emissions, in particular from category 1, "Purchased goods and services", and specifically regarding the production and processing of goods. In comparison, emissions from scopes 1 and 2 play a subordinate role, yet should be taken into account as a fixed component when defining the target, as textile production is publicly perceived as an energy-intensive sector.

2) Reduction potentials

Reduction potentials arise from, among other things, reduction opportunities through efficiency measures, changed production and logistics processes, the use of low-emission or emission-free energy carriers, changed packaging, etc. Reduction potentials will be explored in greater detail in → Chapter 3.4, "Identifying measures."

→ Cf. page 69

3) Influenceability

The influenceability of scopes 1 to 3 emissions (also in terms of time) depends on the sector, product range and business activities of the company along the value chain (vertical integration or position within the value chain) and is determined by a wide range of criteria, including company-specific conditions. Transparently calculated (or at least estimated) GHG emissions are the precondition for determining influenceability, as the possible lever of measures can be identified through reduction potentials. However, it should be kept in mind that the level of

influenceability does not determine how much GHG emissions can actually be reduced (example 3). The following examples illustrate potential differences in the influenceability of emissions:

- Example 1: A company from the machinery and civil engineering industry has identified scope 2 emissions as their emission hotspot. These can be directly influenced by energy procurement, which is typically carried out by the purchasing department. The company can also exert direct influence over the emissions from sold products (downstream scope 3 emissions in the use phase), although potential measures may only take effect in the medium turn, i.e., with a time delay. In any case, both areas for potential influence should be taken into account when setting the target.

- Example 2: A logistics service provider can directly influence its emission hotspots in the medium and long term by purchasing lower-emission vehicles, thereby reducing its scope 1 emissions. In addition to scope 1 emissions, scope 2 emissions from administrative functions, which are comparitively low, should be taken into account when setting the target. Due to their position along the value chain, upstream scope 3 emissions, particularly those from the "Purchased Goods and Services" category, can be influenced by the choice of vehicle manufacturer. Due to the long-term nature of such a decision, a critical discussion should be conducted within the company upon which to base the company's choice of manufacturer in the context of developing a corporate climate target.

- Example 3: A company from the printing sector can benefit from a high level of influenceability of its GHG emissions in the area of its purchased paper production. However, the abatement potential for upstream scope 3 emissions is low if recycled and certified paper is already being used or if the resulting GHG emissions are being compensated for. The target setting should therefore focus on emissions from scopes 1 and 2. The influenceability of less relevant upstream scope 3 emissions is enabled by information being provided, e.g., in the form of a dialog or training session.

- Example 4: A trading company, department store or travel agency can influence GHG emissions via their product or service range. This, however, is typically dictated by their business model. Controllability is possible if, for example, established processes with suppliers are used to reduce GHG emissions in the context of quality management.

- Example 5: A company from the textile retail business can only indirectly influence their emission hotspot and, in a first step, give qualitative specifications to their suppliers. If this is impossible due to the size of the company, participation in an initiative such as the Better Cotton Initiative is a recommended starting point. Emissions from scopes 1 and 2 can be influenced by a textile retail company's choice of energy provider.

4) Stakeholder interests

In addition to the described criteria—emission levels, reduction potentials and influenceability—the interests of internal and external stakeholders must be included in the evaluation and prioritization of emission categories and sources. The majority of these stakeholders demand at least the disclosure of site-specific emissions (scopes 1 and 2). However, the call for more transparency continues to grow, particularly from B2B customers. This demonstrates the increasing significance of the CDP Supply Chain Program (→ Definition of terms) and will be strengthened by legal provisions regarding non-financial reporting in the future. Companies are thus obliged to become more transparent and will inevitably pass on this obligation by demanding transparency from their suppliers.

→ Cf. page 7

From a corporate point of view, not every emission category that makes up a substantial proportion of overall emissions is highly relevant. Vice versa, an emission category with a low emission contribution can be highly relevant if, for example, it is considered essential by stakeholders.

The GHG Protocol "Supplier Engagement Guidance" for scope 3 emissions is available for download at:
→ www.bit.ly/GHGSupplierEngagement

The "AA1000 Stakeholder Engagement Standard (AA1000SES) 2015" supports organizations in assessing the design, implementation and communication of an integrated approach for stakeholder engagement. It can be downloaded free of charge (personal data must be provided) at:
→ www.bit.ly/AccountAbility

"Kellogg commits to reduce absolute value chain emissions (...). Kellogg also has a long-term target (...). We convened our NGO advisors—including the Science Based Targets Initiative partners—and we looked with them at where the company was at in its journey, and the commitments it had made so far. We asked them: what do we need to do to make this more long term, more ambitious? They introduced us to the methods—the Sectoral Decarbonisation Approach and the 3% Solution—that helped us shape and validate our initial thinking. It was really critical that we worked with others—the NGOs, but also government, suppliers, other stakeholders—to understand how we could make meaningful impacts."

Case Study Kellogg, Science Based Targets Initiative

→ www.bit.ly/SBT-Kellogg-CaseStudy

5) Interdependencies and displacement effects

In addition to the above criteria for evaluating and prioritizing emission sources and categories, it is advisable to take into account interdependencies and displacement effects between different emission sources and categories.

- Example 1: When a company's own power generation is replaced with purchased energy, the emissions are displaced from scope 1 to scope 2.

- Example 2: Reducing scope 3 emissions from the "Use phase" can lead to an increase in the emissions from scope 3 category "Purchased goods and services." In general, the question arises as to whether the insourcing or outsourcing of individual activities can have a positive impact on a company's GHG footprint. This type of displacement should be made transparent and can be used when communicating with the public, particularly if the manufactured or distributed product helps the customer (B2B) achieve their GHG emission targets.

Starting point for setting a GHG emission target

To clearly identify company-specific emission hotspots, the results obtained from the prior evaluation and prioritization should be summarized in line with the following categories:

- Scope 1 emissions
- Scope 2 emissions
- Upstream scope 3 emissions
- Downstream scope 3 emissions

→ Figure 11 shows an example of a materiality matrix for identifying the emission hotspots of a company. It can be used as a starting point for a corporate climate target setting.

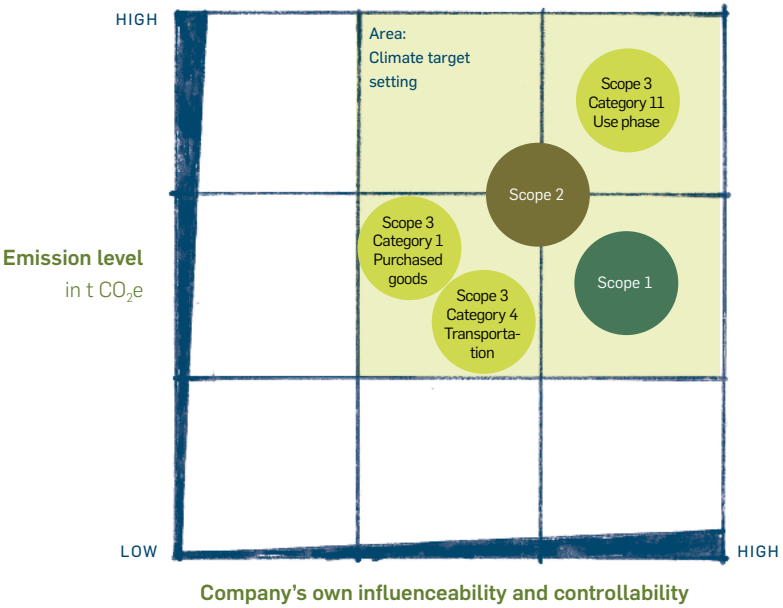


Figure 11: Example of a materiality matrix for a company after the evaluation of scopes and GHG emission categories.

3.2 FORMULATING A CLIMATE STRATEGY

Formulating a climate strategy based on a profound understanding of GHG emission sources, their significance for the business model and their related opportunities and risks is an essential step of corporate climate action: It outlines the action framework and provides orientation for the development of corporate activities. A climate strategy should contain the following basic components:

- Acknowledgement of challenges
- Explanation of how climate change relates to the company
- Ambition level for dealing with climate change
- Target definition and setting
- Transparent plan for reaching the climate target

The action framework for GHG management and the company's desired positioning around climate change are determined by the company's ambition level and target setting.

In addition to site-specific emissions, GHG emission reduction goals should also include scope 3 emissions from upstream and downstream activities, if these prove to be material to the company (→ Chapter 1.4). Beyond this, it is advisable to establish a connection with the corporate strategy, as this tends to increase both the binding character of the strategy as well as awareness of it.

→ Cf. page 31 ff.

The decision to adopt a climate strategy generally lies with the executive board or company management. The implementation of a climate strategy will require significant internal resources and must therefore be executed when the necessary commitment is present. The formulation of the strategy itself should focus on the definition of the climate target and account for the following aspects:

Scope of the climate target

The climate target must be clearly connected to emissions from scopes 1, 2 and 3. If the coverage (i.e., the relative proportion of overall emissions) has not yet reached 100 percent, it makes sense to define a target year for reaching it. For selected scope 3 emission categories, it is advisable to ensure in a first step that a database is available.

Choosing a base year

The base year serves as a reference point for climate targets which will be reached at a later date. A year should be selected as the base year for which a solid database exists and which is considered a typical business year. The GHG Protocol recommends that companies formulate a →🌐 base year recalculation methodology. The agreed upon methodology should specify the general framework for adjusting base year emissions. It should also ensure that when emissions from different years are compared (e.g., base year and current reporting year), consistent inventory boundaries are maintained. It is advisable to develop the methodology separately, yet to reach a joint agreement with the company management about the decision, as it can have a significant impact on how the climate target will be achieved.

→🌐 www.bit.ly/ghgp-base-year

Selecting a target year

The target year for the climate strategy can be identical to the target year of the company strategy or a target year from the political sphere in which regulatory provisions must be met, for instance the years 2020, 2030 or 2050.

Determining the type of climate target (→ Chapter 4)

→ Cf. page 76

Relative targets: Intensity-based targets compare the amount of emissions with a specific unit of economic output or correlate them to other company-specific values, such as employees. Relative targets are often easily reconcilable with the desire for corporate growth and are thus easier to adopt. Compared to absolute figures, however, they are considered less ambitious and tend to be more difficult to integrate into the organization, particularly when it comes to heterogenous product segments.

Absolute targets: Absolute reduction refers to the total quantity of GHG emissions being emitted within a scope or a category. Absolute mitigation targets are rated more positively as they represent a measurable contribution to climate protection. In addition, an absolute target is easier to integrate into different company segments by specific key performance indicators (KPIs).

Level of ambition

The level of ambition is represented by the target emission level (t CO_2e) to be reduced, e.g., in percentage points or tonnage. The reduction refers to energy, activity rate or, ideally, GHG emissions.

Timescale

- Short-term timescale: < 5 years
- Medium timescale: 5 to 10 years
- Timescales for science based targets (SBT) 5 to 15 years.
- To determine the SBT timescale, one must distinguish between base, submission and target year. When selecting a 5-year SBT, the submission month in relation to the half-year period is also decisive.
- Timescales derived from political or scientific deadlines:
  - EU emission trading system phase 3: 2013 to 2020
  - EU emission trading system phase 4: 2021 to 2030
  - →🌐 Paris Agreement: 2020 to 2050

→🌐 www.bit.ly/Paris-Agrmt

When formulating and communicating the climate strategy, it is important for the company to take into account the necessary content-related requirements of climate target setting as well as the basic components described above. These content-related requirements can also be used for the actual description of companies' climate targets. In this context, carrying out comparisons with companies that have already adopted climate targets is recommended.

The following examples show different approaches to climate target setting in the context of formulating a climate strategy:

Example 1—Marks and Spencer: British multinational retailer Marks and Spencer has committed to reducing absolute GHG emissions from scopes 1 and 2 by 80 percent below 2007 levels by 2030. The company also has a longer-term vision of achieving 90 percent absolute GHG emissions below 2007 levels by 2035. Marks and Spencer also commits to reducing scope 3 GHG emissions by 13.3 Mt CO_2e between 2017 and 2030.

Example 2—Kering: Luxury goods holding company Kering has committed to reducing emissions from scopes 1, 2 and 3 from upstream transportation and distribution, business air travel and fuel- and energy-related emissions by 50 percent per unit of value added by 2025, as compared to 2015 as a base year. In addition, the company has committed to reducing scope 3 emissions from purchased goods and services by 40 percent per unit of value added within the same timeframe. This is part of their overall goal to reduce upstream environmental impacts, such as air-polluting emissions, water use, water pollution, land-use change and waste.

Example 3—General Mills: The climate targets of the US corporate group encompass its complete value chain from agriculture cultivation to consumption and all the way to waste disposal (emissions from scopes 1 to 3). The emission hotspot for scope 3 categories lies in purchased raw materials, dairy products and packaging. General Mills has committed to reducing its absolute GHG emissions by 28 percent by 2025 as compared to 2010.

Example 4—Olam: As one of the world's largest agri-businesses, with agriculture, processing and distribution operations, Olam has committed to SBT. With its 4.3 million farmer suppliers, the vast majority of whom are smallholders in emerging markets, the company will implement GHG reduction and adaptation measures to achieve a 2°C goal, which is integral to the climate strategy.

Example 5—Unilever: Unilever's climate target entails reducing emissions from scopes 1 and 2 by 100 percent by 2030 and reducing scope 3 emissions by 50 percent by 2030. Unilever has disclosed its target achievement path as well as the influenceability of its CCF in a transparent fashion.

Example 6—SAP: German multinational software corporation SAP has committed to reducing total scope 1, 2 and 3 GHG emissions by 40 percent by 2025, as compared to 2016 as a base year. This target is an important milestone in reducing emissions by 85 percent by 2050, as compared to 2016 as a base year.

Example 7—Sony: Sony's climate target is both transparent and clear and refers to target year 2050, when Sony aims to achieve climate neutrality. This target was developed in collaboration with the WWF in the context of WWF's Climate Savers Programme. Sony includes all its emissions from scopes 1, 2 and 3 in its climate strategy and discloses its emissions in all 15 scope 3 categories.

The transition to a low-carbon economy is already underway and accelerating around the world. In a 2017 CDP sample, 89 percent of companies reported having emissions reduction targets. Science based climate action is being taken by 321 companies and 82 companies have approved SBT (effective November 20, 2017).

3.3 SETTING A CLIMATE TARGET

When developing a climate strategy, setting a climate target is the core element. Since the UN climate summit in Paris (COP21), the number of internationally active companies engaged in setting an ambitious climate target has risen. The summit marked a watershed moment for climate policy in 2015: With the → Paris Agreement, industrialized, developing and emerging countries are now, for the very first time, obliged to combat global warming under international law. The agreement, which took effect in 2016, requires 195 countries to limit average global warming to well below 2°C (if possible, to no more than 1.5°C) by the end of the 21st century as compared to the pre-industrial age. Beyond this, the international community has also agreed to aim for net zero GHG emissions in the second half of the century. According to the highest-quality scientific research currently available, this means that climate neutrality will be reached between 2060 and 2080.

→ www.bit.ly/Paris-Agrmt

By producing and supplying goods and services, companies can make a significant contribution to climate protection, particularly by reducing emissions from the upstream and downstream value chain. Beyond this, companies can further contribute to reaching the target of the Paris Agreement through the development and commercialization of innovative product solutions and implementation of new business models. In this context, a paradigm shift is required from many companies. They must move away from what is currently, at best, a short- to medium-term perspective dominated by fiscal aspects and embrace a long-term view with ambitious climate targets.

Therefore, setting a company-specific climate target should be oriented towards the 2°C limit (→ Info Box 5) to ensure the long-term competitiveness of the company.

→ Cf. page 66

Setting a target: reference points and approaches

When setting a climate target, the development of the company's business activities over the upcoming five years should generally be taken into account. This helps to shape a target in a manner that is as ambitious as possible (→ Definition of terms) while remaining feasible for the company. The target can be redefined or updated on an annual basis or can be set for the target year. In the past, companies that have already

→ Cf. page 7

decided on climate targets in the context of their climate strategy, have used the following reference points when setting their targets:

→ www.bit.ly/NDC-Registry

- Mitigation potential of GHG reduction measures within the company
- Regulatory environment, e.g., → nationally determined contributions (NDCs) of countries participating in the Paris Agreement, → EU 2020 or → EU 2030 climate package
- Competitors or market/technology leaders

→ www.bit.ly/ClimatePkg2020

→ www.bit.ly/ClimatePkg2030

The → Paris Agreement has introduced the goal of limiting global warming to somewhere between 1.5°C and 2°C. These two new temperature-related reference points have already been used by over 300 companies up until 2017 for setting a science based target. Companies are using the well below 2°C target as a point of orientation for the desired and necessary long-term emission reduction path and are committing themselves to long-term climate targets.

→ www.bit.ly/Paris-Agrmt

STEP 3

Info Box 5: **Science Based Targets**

The SBT approach was jointly developed by the CDP, the UN Global Compact, the World Resources Institute and the WWF as part of the Science Based Targets Initiative (SBTi). It provides companies with a clearly defined path towards future-proof growth. By setting SBT, companies define the extent and timeframe within which they aim to reduce their GHG emissions. The website of the SBTi provides several methodological calculation approaches for developing a corporate climate target in line with the 2°C limit of the Paris Agreement.

Further information is available at: → www.bit.ly/ScienceBasedTargets

"For us as a company, it's a clear business case because we play a key role in helping other sectors to decarbonize. We are at the base of the pyramid."

Sara Goulartt,
Deputy Director of Climate & Environment from the Corporate Sustainability Office, EDP

"This is about how we want to be seen as a company, about running an efficient, responsible business; it is also what our customers expect from us."

John Pflueger,
Principal Environmental Strategist, Dell

Generally, a distinction should be made between two different approaches to setting a climate target:

Bottom-up-approach

Almost all climate strategies with climate targets follow this principle. They are typically based on a short- to long-term timescale and actual reduction potentials within the company. These reduction potentials tend to be exclusively site-related and tend to only include measures that reach the break-even point quickly.

Characteristics of the bottom-up approach:

Advantage: The basis for setting the target is easy to understand.

Disadvantage: Further developing the business model is impossible as scope 3 emissions are frequently not taken into account.

Challenge: A GHG inventory must be created and analyzed as the basis for the bottom-up approach.

Example: A company from the chemical sector sets the climate target of reducing GHG emissions by 10 percent within five years.

Top-down-approach

This refers to setting long-term climate targets serving as guardrails for reducing site-specific impacts as well as the overall climate impact of the company. Top-down climate targets can be defined, for instance, through science based approaches without having first identified all reduction potentials. The most important challenge lies in closing the gap between the top-down and the bottom-up targets.

Characteristics of the top-down approach:

Advantages: Further developing the business model is possible and sometimes even necessary to achieve the targets. In addition, differentiation from the competitors can be achieved through this type of target.

Disadvantage: Considerable resistance must be expected from relevant stakeholders, e.g., from executives (influence, responsibility) or suppliers (data provision, costs) who are not yet convinced of the ability to reach an absolute climate target.

Challenges: The basis for setting the target must be determined, and the process of acquiring data for this purpose is complex.

Example: A company from the chemical sector sets a climate target for reducing scope 1 and 2 emissions by 100 percent within 15 years. In addition, scope 3 emissions are expected to be aligned with the UN target of limiting global warming to below 2°C.

"In the run-up to the 2015 Climate Change Conference in Paris, we decided that METRO would contribute to limiting global warming to a maximum of 2 degrees. We analyzed the necessary and feasible abatement measures together with all stakeholders in the company using a bottom-up approach. As a result, we agreed on a target to reduce our GHG emissions by 50 percent per meter square sales floor by 2030."

Dr. Silvio Schmidt,
Corporate Responsibility,
METRO AG

An ambitious climate strategy requires a mix between a bottom-up and top-down approach. On the one hand, this necessitates continued efficiency increases at company sites (bottom-up). On the other hand, the long-term alignment of all GHG-relevant measures involving the following departments must be made: purchasing, research and development for new product innovations, sales and controlling.

→ www.cdp.net/en

In the context of → CDP reporting for 2014, around 80 percent of the 500 highest-revenue companies in the world (Fortune Global 500) disclosed that they had mostly based their GHG goals on a bottom-up approach. However, these targets vary greatly in terms of ambition level and duration.

Climate target types

Climate targets can be formulated in relative or absolute terms. Relative goals aim to reduce emission intensity, e.g., per value added unit, product unit or employee. They are often set arbitrarily and have the advantage of being easier to control, while comparisons with competitors tend to be more difficult.

Absolute GHG goals are more relevant when it comes to making a meaningful contribution to climate protection, as the climate target is connected to the actual reduction of the company's overall emissions. In addition, a comparison of absolute targets is easier for external stakeholders. Yet companies are faced with major challenges in the context of

absolute targets, as corporate growth expectations, acquisition of companies and sites, divestment of subsidiaries and outsourcing must be taken into account.

Empirically speaking, among companies from Germany, Austria and Switzerland (DACH region) having participated in the CDP reporting for the 2014–2015 reporting period, some 30 percent formulated absolute targets and an additional 30 percent formulated relative-absolute targets.

Durations of climate targets and ambition levels

In 2017, over two-thirds (68 percent) of →🌐 CDP high-impact companies have set carbon emission reduction targets for 2020 or beyond, while 20 percent have set targets for 2030 or beyond (→ Figure 12).

→🌐 www.bit.ly/CDP-TrkProgress

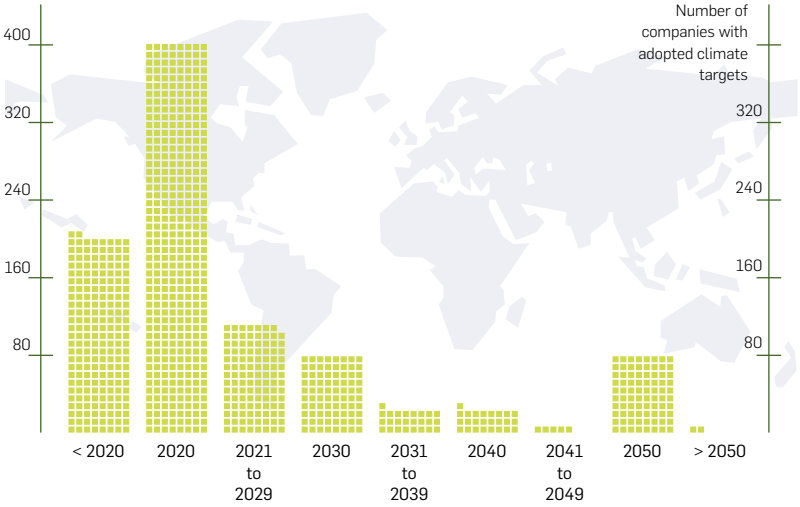


Figure 12: Distribution of targets of high-impact companies by target year.

Source: CDP's second annual analysis in the →🌐 *Tracking corporate action on climate change series*, slide 9 out of 11.

→🌐 www.bit.ly/CDPclimateprogress

For the most part, companies from the DACH region have tended to choose climate targets for up to the year 2020. This was proposed by the political environment of the 2020 EU climate package regarding the 2010 to 2012 period, during which most targets were adopted. The choice of a base year often fell between 2008 and 2012. The situation regarding ambition levels turned out to be similar. Companies formu-

lated reduction goals of 20 percent or slightly higher and this leaned on the 2020 EU climate package which proposes a GHG reduction goal of 20 percent. It is to be expected that numerous companies will continue to align their climate target setting with the regulatory provisions of the EU, e.g., the 2030 climate package with target year 2030 and a climate target of 40 percent compared to 1990 as the base year.

→ www.bit.ly/ClimatePkg2020

→ www.bit.ly/ClimatePkg2030

Science Based Targets

The SBTi (→ Info Box 5) is pursuing the goal of improving, and making more comparable, the ambition level of corporate climate targets. The initiative has developed a new method for this purpose, enabling companies to define climate targets which are aligned with the below 2°C limit for a timescale of up to no later than 2050. This approach explicitly includes various technological possibilities for emission reduction as well as growth expectations for various sectors and companies.

→ Cf. page 66

→ www.bit.ly/Paris-Agrmt

In the context of the Paris Agreement, companies are advised to embrace the logic of the SBTi and to align their climate targets with the below 2°C limit.

SBT setting tool:
→ www.bit.ly/ToolSBT

DGCN discusssion paper for SBT
→ www.bit.ly/DGCNDiscussionPaper-SBT

3.4 IDENTIFYING MEASURES

Identifying reduction potentials is crucial when it comes to developing a climate strategy, as the targets cannot actually be reached if this is not done. The first thing to clarify is whether reduction measures should be identified both before and after setting the climate target, to demonstrate its achievability to the company management, for example.

When defining a climate target, a company must estimate expected emission reductions in order to determine future emission levels. These can be influenced by exogenous effects, organizational changes or proactively through emission reduction measures.

- Examples of exogenous effects:
  - Change in emission factors (e.g., energy mix)
  - Change in production utilization through market developments
- Examples of organizational changes:
  - Acquisition of companies and sites and divestment of subsidiaries
  - Adjustment of the calculation method for creating the GHG inventory (consistency requirement → Section 1.1)
- Examples of site-specific emission reduction measures for reducing upstream and downstream scope 3 emissions are summarized in → Figure 13.

→ Cf. page 20

Upstream scope 3 emissions	Site-specific emissions	Downstream scope 3 emissions
▸ Purchasing guidelines/code of conduct ▸ Travel guidelines ▸ Emissions reduction projects with suppliers ▸ Use of alternative packaging materials	▸ Increasing transparency, control and coordination ▸ Energy efficiency ▸ Vehicle fleet strategy ▸ Site's own renewable energy generation ▸ Purchase of renewable energies ▸ Biogas ▸ Compensation of GHG emissions	▸ R&D for continuous increase of product efficiency ▸ Development of products/ business models ▸ Measures with reduction potential ▸ Cooperation with (B2B) customers around product innovations and for product returns

VALUE CHAIN

Figure 13: Measures with reduction potentials for GHG emissions target setting.

Influencing site-specific emissions through energy efficiency measures

The analysis of the existing energy situation often leads to the recognition of savings potentials in administration and/or production during the basic GHG data collection process. Reduction potentials can be identified if an energy consumption analysis is integrated into internal processes.

The ISO 50001 Energy Management System (EnMS) implementation guide (free of charge, provision of personal data required):

1. TÜV → www.bit.ly/ISO50001Guide
2. GUTcert → www.bit.ly/ISO50001certification

Influencing site-specific emissions through renewable power procurement

The procurement of renewable power is an essential instrument for reducing a company's GHG inventory. While the conventional power generation can create GHG emissions of over 1,000 g CO_2e/kWh, the generation of power from renewable energy sources only causes GHG emissions in the upstream chain (e.g., through the construction and maintenance of generating plants and infrastructure). These large savings potentials are particularly relevant since power procurement makes up a considerable proportion of many companies' site-specific GHG emissions. As a rule, companies should aim to use as much renewable power as possible.

In the process, companies must be aware that the origin of power cannot be changed simply by changing their contract: The power procured by the company site still originates, physically speaking, from the same plants as before. However, by opting for renewable power, companies are paying their utility company explicitly for the generation of renewable power.

In early 2015, new guidelines for the calculation and reporting of power procurement were presented by the GHG Protocol, and have since become the new standard for other organizations as well (CDP, GRI). Companies must aim to align the calculation and disclosure of their GHG emissions from power procurement with these guidelines, so as to ensure transparency and comparability with other companies' GHG inventories.

If a company procures renewable energy, this does not mean that its power consumption changes or that it is tapping financial or energy-related savings potentials. In other words, although switching to renewable power is a very effective measure, it should not replace other saving measures.

GHG Protocol guidelines for scope 2 emissions for the procurement of renewable power available at:
GHG Protocol: → www.bit.ly/GHGScope2
CDP → www.bit.ly/CDPTech

Influencing site-specific emissions through compensation measures

Voluntary GHG compensation measures as a climate protection instrument can significantly contribute to efficient emission reduction. However, this instrument should only be used to compensate for unavoidable emissions. This requires GHG emissions to be reduced through specific reduction measures beforehand.

For years now, the number of compensation services on the market has been growing. There is no central certification procedure for voluntary compensation measures and no uniform or binding standards, unlike for UN climate protection projects, e.g., through the use of the Clean Development Mechanism (CDM). This leads to quality fluctuations in a market that is complex and often confusing for consumers. The annual Ecosystem Marketplace study *State of the Voluntary Carbon Markets* analyzes the market for voluntary GHG compensation measures. It is based on a survey of international carbon service providers and project developers, and can be used for orientation.

Global market analysis of voluntary compensation of GHG emissions:
→ www.bit.ly/ForestTrendsPublications

Influencing upstream and downstream scope 3 emissions

For companies with ambitious climate targets, it is not sufficient to merely limit themselves to site-specific measures that reach the break-even point quickly and thus deliver immediate results. Stakeholders, investors, customers, legislators and society at large are increasingly demanding that companies accept responsibility along the value chain, too. Companies should therefore also seek to identify and implement reduction measures for upstream and downstream scope 3 emissions.

A reference point for suitable measures is provided by the publication *Unternehmerisches Klimamanagement entlang der Wertschöpfungskette – eine Sammlung guter Praxis* (German version only). It lists practical examples for almost all scope 3 categories:

"The need to hit the target has driven innovation. For example, we have been gradually reforming our catering operations to reduce the associated emissions. This means sourcing more local, seasonal produce, more organic, less red meat. These small changes have had a huge impact: we halved the emissions from our on-board catering between 2008 and 2016, with no extra cost. At the same time, customer satisfaction has gone up, so it's a win-win."

Dorothée Bernier, Corporate Social Responsibility, Thalys:

STEP 3

- **Category 1—Purchased goods and services:** Together with suppliers, PUMA AG carried out a potentials analysis in emerging and developing countries and subsequently implemented energy savings measures amounting to 62,000 MWh or 44,500 t CO_2e.

- **Category 4—Transportation and distribution (upstream):** DB Schenker was able to save 2.5 Mt CO_2e through various measures (e.g., using sulfur-reduced fuel, ballast water treatment, cold ironing and slow steaming) from 2006 to 2015.

- **Category 5—Waste:** Telefónica and AfB designed a concept for recycling used notebooks, PCs and monitors. This enabled them to achieve savings of some 250 t CO_2e from 2013 to 2015.

- **Category 7—Employee commuting:** VAUDE Sport GmbH & Co. KG was able to reduce 38 percent of its GHG emissions in 2015 as compared to the base year 2011. It accomplished this through a bike support program, carpooling with company and private cars and by connecting its company headquarters to the public transportation network.

- **Category 12—End-of-life treatment of sold products:** From 2010 to 2015, Tetra Pak GmbH & Co. KG prevented emissions amounting to some 270,000 t CO_2e by increasing its recycling rate.

- **Category 15—Investments:** The ASN Bank was able to reduce the relative emissions from its managed assets by over 15 percent from 2011 to 2015.

→ www.cdp.net/en

As an alternative to using this publication, potential scope 3 measures can also be looked up in the CDP questionnaires of the respective companies, if the questionnaires are published on the → CDP website. The questionnaires can be found in chapter 14 of each CDP Climate Change Investor Request.

A collection of scope 3 practical examples can be found at (German version only):
→ www.bit.ly/Scope3Beispiele

Public corporate questionnaire for climate change, water and forestry:
→ www.cdp.net/en

Presenting emission changes

After a company has identified mitigation measures, exogenous effects and organizational changes, an overview of emission changes should be created, e.g., using a waterfall diagram. The purpose of such a diagram is to present the contribution of individual emission-related measures throughout the base year or the year to be used for the assessment. Emission reductions result from the difference between the base and the target year and serve as a reference point for setting a climate target based on a bottom-up approach (→ Figure 14).

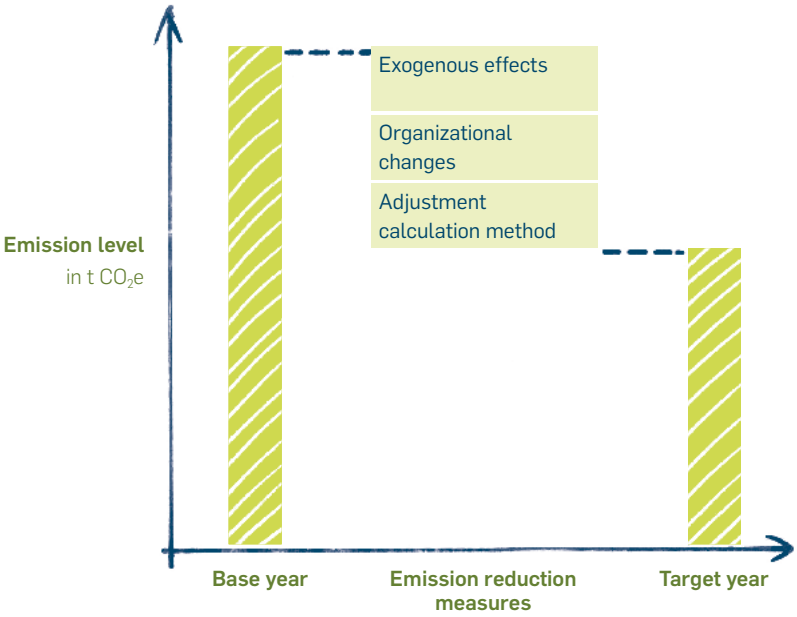
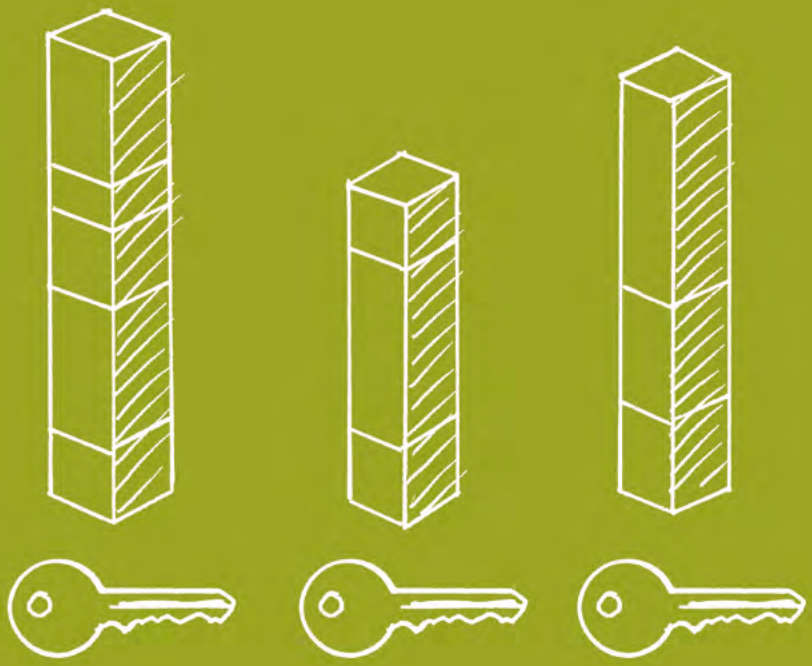


Figure 14: Example of a company's waterfall diagram.

Source: Based on → *Vom Emissionsbericht zur Klimastrategie* (German version only), p. 71, CDP/WWF, 2016

→ www.bit.ly/KlimaReporting

STEP 4: KEY PERFORMANCE INDICATORS AND TARGET ACHIEVEMENT



Key performance indicators (KPIs) are not objectives in themselves but **instruments for measuring and controlling the achievement of climate targets**. They are most effective when companies possess a clear and binding organizational structure and incentive scheme.

The challenge lies in **selecting and defining** KPIs: Their significance, aggregation capabilities, comparability and steering effect should be taken into account.

4.1 ORGANIZATIONAL STRUCTURE WITHIN THE COMPANY

When a climate strategy or climate target is laid down, the framework for corporate climate actions is defined. By the time the management adopts a climate strategy or climate target, all the necessary activities for achieving them should be legitimized and anchored in the organization of the company. This is described in both the → Preparatory deliberations Chapter as well as in → Chapter 1. Tasks, responsibilities and objectives must be defined in order to be anchored in the organization, especially in large companies. Examples are shown in → Figure 15.

→ Cf. page 10 ff.

→ Cf. page 18 ff.

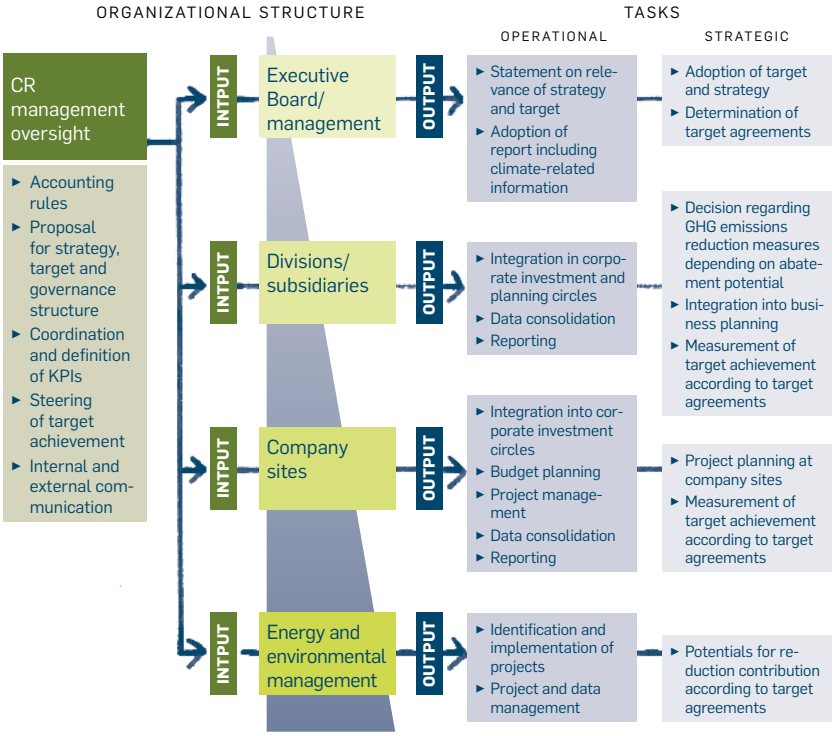


Figure 15: Organizational structure for corporate climate action.

Corporate climate action is generally overseen by those responsible for sustainability and environmental protection within the company. This

is where rules for emissions accounting are determined, proposals for the climate strategy and climate targets are developed and KPIs for controlling the target achievement are defined (→ Chapter 4.2). The person responsible for corporate climate action organizes and coordinates all communication around these topics (→ Chapter 5).

→ Cf. next page

→ Cf. page 84 ff.

Different business units have different strategic and operational tasks regarding the implementation of the climate strategy. While the employees responsible for climate and energy management should identify, plan and potentially implement reduction and prevention measures, site and business unit representatives are to oversee the implementation of the proposed measures into their site-specific planning, processes and investment circles. At the business management level, the action framework is determined in the form of goals, target agreements and budgets.

Depending on the size of the company, the following internal processes and instruments can be used for achieving the climate target:

- Department-level discussions and production forums
- Regular controlling and investment meetings
- Regular reporting to the executive board and management (biannual)
- Monetary incentive schemes for the company-wide and departmental management

→ Table 1 shows a list of monetary target agreements and their related incentive schemes of typical companies that offer variable compensation at the company management level with target agreements for reaching sustainability and climate targets.

Company	Country	Employee group	Performance indicator	Proportion of compensation
Deutsche Lufthansa	Germany	Board/Executive Board	Sustainability figures	25% of bonus linked to sustainability goals
Johnson & Johnson	USA	Executive Committee, CEO, CPO	Emission reduction for 2020	Bonus payments if targets are achieved
Kering	France	Chairman, CEO	Targets for talent management organization, CSR and sustainability	30% of variable compensation based on sustainability goals, among others (e.g., authorized SBT)

Company	Country	Employee group	Performance indicator	Proportion of compensation
LG Uplus	South Korea	Board/Executive Board	Climate target and annual progress	5% of KPI results and direct connection to annual salary
Mahindra & Mahindra	India	CEO, Unit Heads, Energy Managers	GHG emissions, energy and water reduction	Performance-based remuneration*
Tetra Pak	Switzerland	Board/ Executive Board, Management Group Environment	Efficiency and recycling target	Achieving climate targets (scopes 1, 2 and 3)*
Westpac Banking	Australia	CEO, Group Executives	Reaction to climate change and target achievement	10% of short-term incentives in CEO's score card

* Payment dependent on the degree of annual target achievement

Table 1:
Corporate incentive schemes.

The achievement of targets requires more than simply the necessary organizational structure. Company-specific KPIs are just as important. In order for the achievement of the target to be controlled, the requirement should be broken down into precisely measurable and assignable individual requirements. The selection of meaningful KPIs is important (fewer is better than more). Moreover, it is advisable to define intermediate targets which contribute to reaching the target and have been previously agreed upon with all relevant production units.

4.2 DETERMINING AND CONTROLLING KPIs

KPIs are either aggregated key indicators or individual indicators and represent a controlling and target achievement instrument. There are various courses of action for meeting adopted climate targets. Depending on the company structure, these include technical, structural or economic key indicators. In this sense, it is not necessary for a target to refer to absolute GHG emissions. A measurable and controllable climate target can, for example, refer to average efficiency rather than an absolute KPI. If an absolute KPI is communicated externally, it can be broken down into different sub-categories and relative parameters. The specific contribution per site or business unit is thus assessed according

to its actual potential, and not according to a scattergun approach. This correlation is shown in →🖹 Figure 16. It is important for the set targets to enable aggregation, comparability, validity and/or a control effect.

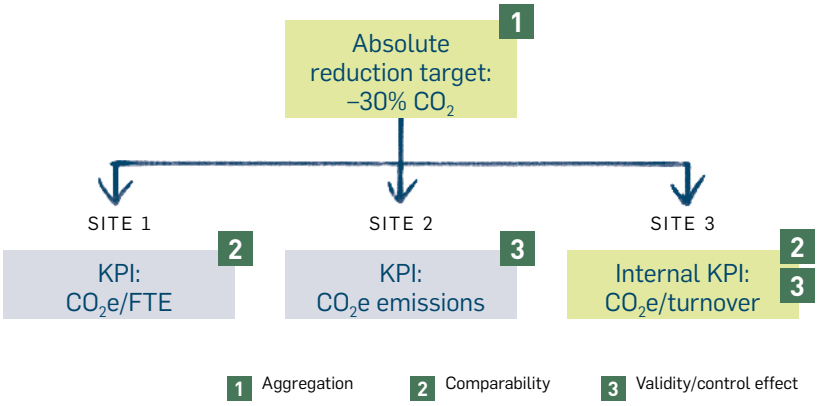


Figure 16: The challenge of defining KPIs.

The following characteristics are relevant for the selection of KPIs:

1. **KPI characteristics for internal impact**
   - Acceptance and connectivity with existing instruments and KPIs in the company
   - Control effect for reaching the set target

2. **KPI characteristics for external impact**
   - Connection to core business with provision of a reduction target (scopes 1 and 2 or scope 3)
   - Reference to either the highest or the highest expected emissions, i.e., Influencability of emission categories and sources due to stakeholder expectations
   - Connectivity to political framework conditions

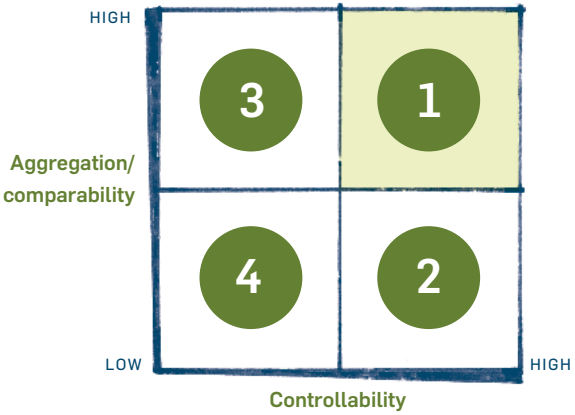


Figure 17: Example of KPI evaluation.

To control an absolute climate target, the following KPIs, for example, are suitable: CO_2 emissions (quadrant 1), energy consumption (quadrant 1), energy need (quadrant 1). To control a relative climate target, the following KPIs, for example, are suitable: CO_2e/product unit (quadrant 2), CO_2e/m^2 or CO_2/turnover in euros (quadrant 3), CO_2e/FTE or MWh/FTE (quadrant 3), CO_2e/profit in euros (quadrant 4). An evaluation of these KPIs, which are often used for external communication, is shown in → Figure 17.

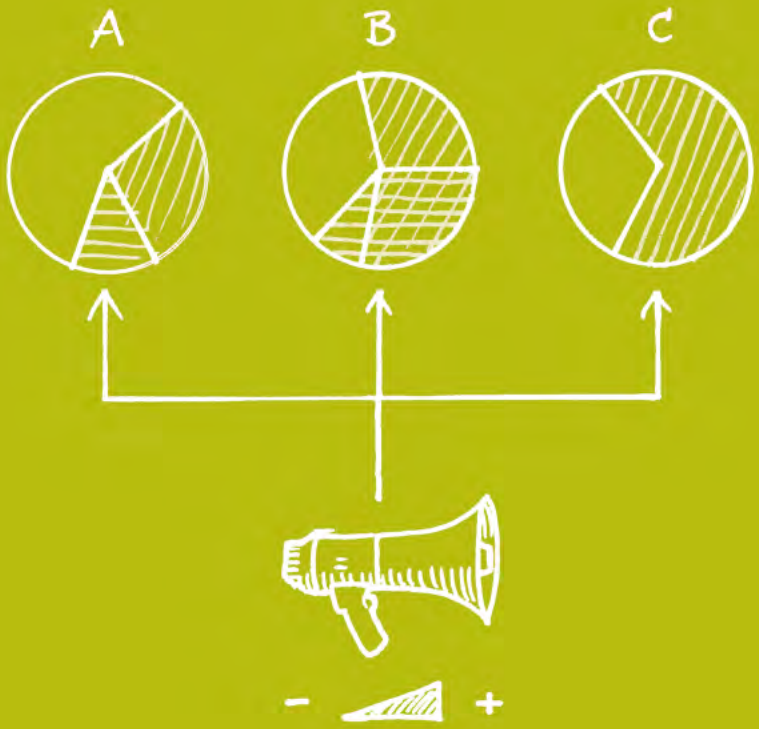
KPIs for measuring and controlling scope 1 and 2 emissions are typically easier to assess than KPIs for emission sources in the scope 3 area. → Table 2 provides an overview of possible KPIs for scope 3 categories and shows their connection with other categories.

Scope 3 categories	Potential KPIs
3.1 Purchased goods and services	▸ Product carbon footprint (PCF)-related: emission intensity per product unit ▸ Material-related: e.g., proportion of recycled materials/BCI-certified cotton ▸ Material efficiency: x% less material used per unit ▸ Suppliers: x% have a GHG inventory and/or a climate target and/or have achieved emission reductions
3.2 Capital goods	▸ PCF-related: emission intensity per capital good
3.3 Fuel- and energy- related emissions	▸ (Cradle-to-gate) emission intensity of energy mix ▸ Energy mix: proportion of energy obtained from certain energy sources or countries of origin

Scope 3 categories	Potential KPIs
3.4 Transportation and distribution	▸ Transportation: emission intensity in CO_2e/tkm ▸ Storage: energy efficiency in kWh/(m^2 × a) of the building ▸ Proportion of transportation modes: e.g., at least 50% transportation by railway or waterway
3.5 Waste	▸ Emission intensity of waste (based on scope 1 and 2 emissions of disposal company) ▸ Proportion of disposal type (in quantity/weight) ▸ Recycling rate
3.6 Business travel	▸ Total distance ▸ Emission intensity in CO_2/pkm ▸ Proportion of eco-mobility as part of overall pkm ▸ Non-motorized modes of transportation ▸ Public transportation (train and bus) ▸ Car sharing ▸ Proportion of teleconferences from total number of meetings
3.7 Employee commuting	▸ Emission intensity in CO_2/pkm ▸ Non-motorized modes of transportation ▸ Public transportation (train and bus) ▸ Car sharing and car sharing agencies
3.8 Assets the company has rented or leased	▸ Vehicles: emission intensity in CO_2/tkm; proportion of alternative motors ▸ Buildings: energy efficiency class in kWh/(m^2 × a) ▸ Machines: energy consumption
3.9 Transportation and distribution	▸ Transportation: emission intensity in CO_2/tkm ▸ Storage: energy efficiency in kWh/(m^2 × a) ▸ Proportion of modes of transportation: e.g., at least 50% of transportation by railway or waterway ▸ Return rate (for mail order trade)
3.10 Processing of sold products	▸ Emission intensity of subsequent processing (based on scope 1 and scope 2 emissions of the processing company)
3.11 Use of sold products	▸ Fuel and energy consumption (in l, kWh or g CO_2/km, etc.) during the utilization phase ▸ Share of new product line in sold products
3.12 End-of-life treatment of sold products	▸ Emission intensity of waste (based on scope 1 and scope 2 emissions of disposal company) ▸ Proportion of disposal type (in quantity/weight) ▸ Recycling rate
3.13 Assets leased or rented out by the company	▸ Fuel and energy consumption (in l, kWh or g CO_2 pro km, etc.) of leased-out assets ▸ Vehicles: proportion of alternative motors ▸ Buildings: energy efficiency class in kWh/(m^2 × a)
3.14 Franchises	▸ Scope 1 and scope 2 emissions of franchise holders ▸ Energy mix ▸ Share of franchise holders with energy management, etc.
3.15 Investments	▸ Portfolio composition: e.g., share of investments from “clean” sectors

Table 2: Typical KPIs for scope 3 categories and connection to other categories.

STEP 5: COMMUNICATION



Internal and external communication should be used in **parallel to the preceding steps**, both to win over the company's employees and executives as disseminators and to regularly and purposefully inform external stakeholders about any corporate climate action progress being made.

5.1 INTERNAL COMMUNICATION

Compared to external communication, internal communication should be unembellished, i.e., inconvenient truths and target conflicts should not be kept secret and insecurities and assumptions should be clearly communicated. →Figure 18 illustrates the typical content of internal and external climate action communication.

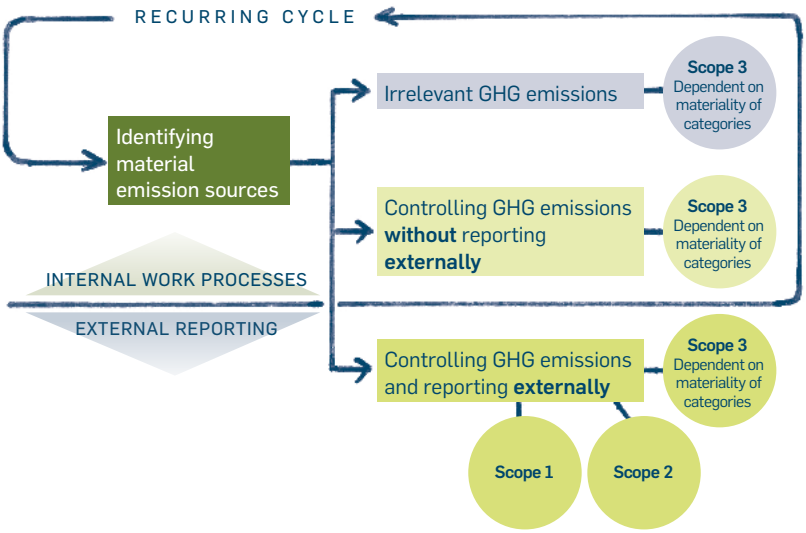


Figure 18: Determining the content of internal and external reporting.

Source: →*Vom Emissionsbericht zur Klimastrategie* (German version only), p. 38, CDP/WWF, 2016.

→ http://bit.ly/KlimaReporting

Management reporting

The performance of a company should be communicated to stakeholders in a regular and transparent manner. Reporting and management tools can enable the representation of large quantities of data in the form of clear charts (→ Info Box 3). Dashboards allow climate change officer, subdivision managers or site managers in the company to compare set targets with actual performance.

→ Cf. page 37

The corporate management, especially the top management executives, require additional criteria for their decision making. This is prepared by the climate change officer. Potential controlling errors can be prevented through clear options for remediation and an evaluation of cause-effect relationships.

Employee involvement

To enable targets to be achieved and measures to be initiated, employee and executive training should be carried out with the objective of raising awareness and improving internal communication. Such training sessions can take place in person or online. These sessions typically help to increase acceptance within the company and enable dialog to take place. Training can also help to anticipate and prevent potential obstacles at an early stage in the process.

The goal of such training is to convey to employees and executives the strategic relevance of climate change action for the corporate competitiveness and future viability. Training can also show how global changes (e.g., climate change, demographic change, urbanization, globalization, etc.) and the UN Sustainable Development Goals (SDGs) can affect the company's business model, what expectations stakeholders might have in this context, how the competition is addressing those challenges and how the significance of climate protection and sustainability can be measured, controlled and adjusted for the business's success.

Practical experience has demonstrated that such training tends to sharpen executives' awareness of the strategic relevance of these topics. They in turn serve as disseminators within their areas of oversight and, together with their team members, contribute to achieving both the climate strategy and the overarching targets of the company.

The results of such training sessions can then be deepened in follow-up workshops, translated into partial targets and KPIs, and carried over into the concrete planning of milestones (e.g., in such specialist areas as work safety, environmental protection, waste management and energy).

5.2 EXTERNAL COMMUNICATION

Practical examples of external climate reporting currently show a high level of freedom regarding form and content. This is true both for voluntary reporting in company- or customer-specific GHG brochures and in online reporting.

Climate reporting

Companies use a wide variety of formats for reporting their GHG emission and climate strategy, e.g., they include it into their sustainability report or integrated business report. In addition, the goal of many initiatives within the area of energy and GHG emissions is to communicate companies' dedication in these areas. The → RE100 (100% renewable power) and → EP100 (double energy productivity) initiatives can be found in the energy area. The → Science Based Targets Initiative (SBTi), the → Low Carbon Technology Partnerships Initiative (LCTPi) and the → UNFCCC initiative, NAZCA (Non-State Actor Zone for Climate Action), are within the climate area. These initiatives, along with others for the field of local authorities and cities, can be accessed via the → We Mean Business website.

→ www.re100.org

→ www.bit.ly/EP100initiative

→ www.bit.ly/SBT-CompaniesTakingAction

→ www.lctpi.wbcsd.org

→ www.bit.ly/UNFCCC-NAZCA

→ www.bit.ly/WMB-Coalition

The following recommendations and specifications form the basis for disclosures regarding corporate climate action. They follow both non-financial reporting requirements for capital market-oriented companies and voluntary standards such as the GRI Standards, the GHG Protocol and ISO 14064. The following procedure is recommended for external communication:

1. Definition of target group and communication objective
2. Planning of data and information disclosure for external GHG emission reporting
3. Preparation of data taking into account methodological and formal requirements
4. Evaluation of external communication through various stakeholder groups to monitor target achievement and obtain indicators regarding adjustments

Corporate climate and strategy reporting should include the following:

- The description of the connection between a company's own business activities and climate change and resulting risks and opportunities for the business model
- The description of the selected focus for action as well as limitations, formulation of a climate strategy including a climate target
- The delineation of the effects of corporate activities on achieving the set targets.

The reporting must ensure that quantitative information on emissions from scopes 1 to 3, calculation logic, data sources and quality, methodologies as well as reasons for the development of emissions and changes as compared to the previous year be clearly disclosed and (ideally) cover a period of several years. In addition, the following methodological requirements should be met: data rounding, handling of power from renewable sources, no offsetting or GHG compensations, but separate disclosure.

The following initiatives and standards can provide companies with support for their climate reporting:

- In June 2017, the Task Force on Climate Related Financial Disclosure (TCFD) published its finalized recommendations for reporting climate-relevant risks of companies. The goal of the initiative is to bring about a more transparent disclosure of the financial impact of climate change for companies. TCFD has developed four recommendations on climate-related financial information that can be applied by companies. These recommendations refer to information about governance, strategy, risk management, measures and targets. In addition, the TCFD recommends that companies disclose climate-related financial

information in their publicly available annual reporting. Moreover, the TCFD recommends that explanatory notes be provided regarding the potential effects of climate-related risks and opportunities based on various scenarios. This should include a scenario in which global warming remains at under 2°C.

- The Global Reporting Initiative (GRI) develops guidelines for sustainability reporting aimed at providing standards for defining KPIs for the voluntary reporting of corporate sustainability aspects. The GRI Standards provide seven GRI indicators for assessing GHG emissions.
- The Climate Disclosure Standards Board (CDSB) provides companies with a framework for reporting environmental information which is comparable to the requirements of financial reporting.

The most relevant long-term stimuli for corporate climate reporting might well be expected to come from the TCFD.

GRI → www.bit.ly/GlobalReportingInitiative

Task Force on Climate-related Financial Disclosure (TCFD)
→ www.bit.ly/ClimateDisclosures

Climate Disclosure Standards Board
→ www.bit.ly/ClimateDisclosureStandards

Rating and ranking

The capital market is showing growing interest in sustainability topics since pure financial reporting only delivers condensed results from past management action. To achieve a more comprehensive assessment of the future viability of a business model, non-financial indicators, such as a company's GHG inventory and climate target, prove helpful for evaluating the future costs of adjusting to stricter legislation.

Rating and ranking agencies specialized in sustainability and GHG data collection evaluate the non-financial information of both listed and non-listed companies. This information is then prepared and, for example, sold to investors that use the data in their investment and loan decisions.

FURTHER RESOURCES AND TOOLS

Databases for emission factors

Emission factors provided by VDA
www.bit.ly/VDA-EF

Emission factors for generating energy from fossil fuels
www.bit.ly/IEA-Emissions

Emission factors for company-relevant processes
www.bit.ly/FactorsUK

Emission factors for larger-scale fuel use
www.bit.ly/FossilFuelsEmissions

Emission Factors used by the Intergovernmental Panel on Climate Change (IPCC)
www.bit.ly/EFDBemissionfactors

Guidance documents and frameworks

AA1000 AccountAbility Stakeholder Engagement Standard
www.bit.ly/AccountAbility

CDP Scope 2 Guidelines
www.bit.ly/CDPTech

Climate Disclosure Standards Board
www.bit.ly/ClimateDisclosureStandards

EPA Center for Corporate Climate Leadership
www.bit.ly/EPAClimateLeadership

EPA Simplified GHG Emissions Calculator
www.bit.ly/EPAEmissionsCalculator

GHG Protocol: Scope 2 Guidance
www.bit.ly/Scope2Guidance

GHG Protocol: Technical Guidance for Calculating Scope 3 Emissions
www.bit.ly/Scope3Calc

GHG Protocol Supplier Engagement Guidance for Scope 3 Emissions
www.bit.ly/GHGSupplierEngagement

GHG Protocol's "Technical Guidance for Calculating Scope 3 Emissions"
www.bit.ly/ghgp-guidance

Global Reporting Initiative
www.bit.ly/GlobalReportingInitiative

Guidance for agricultural sector
www.bit.ly/AgricultureGuidance

ISO 50001 GUTcert
www.bit.ly/ISO50001certification

ISO 50001 TÜV
www.bit.ly/ISO50001Guide

NDC Registry for Nationally Determined Contributions
www.bit.ly/NDC-Registry

Science Based Targets
www.bit.ly/ScienceBasedTargets

Task Force on Climate Related Financial Disclosure (TFCD)
www.bit.ly/ClimateDisclosures

WBCSD reporting exchange
www.bit.ly/SustainabilityReportingExchange

Software providers

(Unless otherwise marked, all offers are fee-based)

Accuvio (Energy & Carbon)
www.bit.ly/accuvio

ADEC (MetricsTrac)
www.bit.ly/MetricsTrac

CarbonTrust (Footprint Manager)
www.bit.ly/CarbonFootprinting

CarbonView (Sustainability Reporting)
www.bit.ly/CarbonView

cii (Sustainability Data Management)
www.bit.ly/CGControlling

Cloudapps (Energy & Carbon Management)
www.bit.ly/sustainabilitycloudapps

CSRware (Environmental Sustainability Management Software)
www.bit.ly/CSRware

Dakota Software (Greenhouse Gas and Energy Application)
www.bit.ly/dakotasoft

EcoMetrica (Carbon/GHG)
www.bit.ly/ecometricaSustainability

EcoPortal (Environmental Software)
www.bit.ly/ecoportalManagement

ecova (Carbon Management)
www.bit.ly/ecova

Enablon (Greenhouse Gas Emissions Software)
www.bit.ly/EnablonGHG

EnergyDeck (EnergyDeck Platform)
www.bit.ly/EnergyDeckPlatform

FigBytes (Carbon Module™)
www.bit.ly/FigBytes

Footprint Foundation (Enterprise Carbon Accounting)
www.bit.ly/FoundationFootprint

GreenIntelli (Carbon Management & Reporting)
www.bit.ly/GreenIntelli

Greenstone (Environment)
www.bit.ly/GreenstonePlus

Intelex (Air Emissions Management)
www.bit.ly/Intelex

ISOmetrix (Environmental & Social Sustainability)
www.bit.ly/IsoMetrix

Isystain (Energy & Carbon)
www.bit.ly/iSystain-carbon-and-energy

SAP (Sustainability Performance Management)
www.bit.ly/SAPsustainabilitysoftware

SBT setting tool
www.bit.ly/ToolSBT

SupplyShift
www.bit.ly/SupplyShift

thinkstep (SoFi)
www.bit.ly/SOFIsustainability

Turnkey Solutions
www.bit.ly/TurnkeySolution

UL (former CR360) (PURE sustainability)
www.bit.ly/UL-EHS

WeSustain (WeCarbon)
www.bit.ly/wesustain

Standards

Corporate Value Chain Standard (Scope 3)
www.bit.ly/Scope3Standard

GHG Protocol
www.bit.ly/ghgprotocol

Corporate Standard
www.bit.ly/CorporateStandard

Product Life Cycle Emissions
www.bit.ly/ProductStandard

Reporting Standard for Cities
www.bit.ly/GHGProtocolCities

Studies and Reports

Die Zukunft der globalen Wertschöpfung
www.bit.ly/Scope3-study

CDP Climate Change Report 2016—DACH 350+ Edition
www.bit.ly/CDP-DACH2016

Discussion Paper for 3.1 of the Global Compact Network Germany
www.bit.ly/DGCNDiscussionPaperS3K1

Discussion Paper for 3.4/3.9 of the Global Compact Network Germany
www.bit.ly/DGCN-DiscussionPaperS3K4a9

Discussion Paper SBT of the Global Compact Network Germany
www.bit.ly/DGCNDiscussionPaper-SBT

A collection of scope 3 practical examples (in German only) can be found at:
www.bit.ly/Scope3Beispiele

Global market analysis of voluntary compensation of GHG emissions
www.bit.ly/ForestTrendsPublications

Tools/templates

Economic Input-Output Life Cycle Assessment (EIO-LCA)
www.bit.ly/EIO-LCA

Scope-3 Evaluator from GHG Protocol and Quantis
www.bit.ly/Scope3Evaluator

Data sources for scope 3 categories

Scope 3 category	Data collection methodology	Precision of GHG emission data collection
3.1 Purchased goods and services	▸ Supplier-specific method based on supplier emission data	High
	▸ Average-data method based on purchasing volumes, emission factors from free or fee-based databases	Medium
	▸ Spend-based emission factors (DEFRA) → www.bit.ly/DEFRA-Guidelines	Low
	▸ Spend-based EEIO method: EIO-LCA (Carnegie Mellon University) → www.bit.ly/EIOLCA	Low
3.4 Transportation and distribution (upstream)	▸ Collection of primary fuel-intensity and location-specific data from logistics service providers	High
	▸ Distance-based with EcoTransIT online tool → www.bit.ly/EcotransIT-Tool	Medium
	▸ Distance-based method (transport) and average-data method based on storage volumes and days stored (warehousing), default emission factors	Low
3.9 Transportation and logistics (downstream)	▸ Collection of primary fuel-intensity and location-specific data from logistics service providers	High
	▸ Distance-based with EcoTransIT online tool → www.bit.ly/EcotransIT-Tool	Medium
	▸ Distance-based method (transport) and average-data method based on storage volumes and days stored (warehousing), default emission factors	Low
3.11 Use of sold products	▸ Direct emissions = sold products in the reporting year × overall use during complete service life × energy or fuel consumption × life cycle emission factor/GWP	High
	▸ Direct emissions (fuels and renewable energy) = sold quantity in the reporting year × combustion emission factor	High
3.1—3.15	▸ Quantis online → www.bit.ly/Quantis-Tool	Low

Table 3: Typical data sources for selected scope 3 categories.

Thank you for your interest.
We invite you to register for our upcoming events:
→ http://bit.ly/DGCN-calendar

This publication aims to support companies in improving their climate performance and addressing corporate climate action. It offers companies concrete information, approaches and tools for the step-by-step introduction of effective and holistic GHG management.

Companies wishing to address the topic in more detail are invited to visit our website where they will find further information, tools and implementation examples.

→ www.globalcompact.de/en/

Furthermore, companies are encouraged to participate in the dialog and learning formats. This offers an opportunity for companies to further develop their corporate climate action, interact and exchange ideas with other companies. It is the hope of the Global Compact Network Germany that engaging in the topic of climate action will prove an enriching experience for companies of all sizes.

→ http://bit.ly/DGCN-activities

www.globalcompact.de/en
www.unglobalcompact.org