Climate Management in Companies

A Practical Guide

German Environment Agency

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Guidance

Climate management in companies

Practical guide

by

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Abstract:

This guide provides practical guidance on how companies can establish and operate a systematic, transparent and credible climate management system. It is aimed at organisations that wish to systematically integrate climate protection, climate adaptation and the management of climate-related risks into their corporate governance, thereby meeting legal requirements as well as the expectations of customers, investors and other stakeholders. It is based on current legal and political frameworks (e.g. the European Green Deal, the German Climate Protection and Climate Adaptation Act, the EU ETS, the CSRD) as well as established standards such as the GHG Protocol and relevant ISO standards.

The guide is structured in nine stages and covers key thematic chapters: governance (senior management responsibility, delegation to climate teams, employee engagement), defining organisational and operational accounting boundaries, data management and GHG accounting (Scope 1–3, emission factors, biogenic CO_2), integration of climate-related risks (physical and transition risks), target setting (GHG reduction targets, adaptation targets), planning and prioritisation of measures (avoidance, reduction, adaptation, offsetting), and internal and external communication. The guide concludes with guidance on monitoring, audit procedures and measures for continual improvement.

With practical guidance and best-practice examples, the guide offers numerous practical tools and aims to provide organisations with verifiable, transparent and actionable guidance for effective climate management.

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List of abbreviations

Abbreviation	Meaning
AMS	Work Management System
BEHG	Fuel Emissions Trading Act
BMU	Federal Ministry for the Environment
BMWK	Federal Ministry for Economic Affairs and Climate Action
BMWSB	Federal Ministry for Housing, Urban Development and Construction
BVL	German Logistics Association
CH_4	Methane
CIP	Continual Improvement Process
CO_2	Carbon dioxide
CO_2 eq.	Carbon dioxide equivalents
CSRD	Corporate Sustainability Reporting Directive
DAkkS	German Accreditation Body
DAU	German Accreditation and Licensing Association for Environmental Verifiers Ltd
DEFRA	Department for Environment, Food & Rural Affairs (UK)
DNK	German Sustainability Code
EMAS	EU Environmental Management and Audit Scheme
EmpCo Directive	EU Directive “Empowering Consumers for the Green Transition”
EMS	Environmental Management System
EnEfG	Energy Efficiency Act
EnMS	Energy Management System
EPD	Environmental Product Declaration
ESG	Environmental, Social, Governance
ESRS	European Sustainability Reporting Standards

Abbreviation	Meaning
EU ETS	European Emissions Trading Scheme
F-gases	Fluorinated greenhouse gases
PFCs	Perfluorocarbons
GHG	Greenhouse Gas
GWP	Global Warming Potential
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
KAnG	Climate Adaptation Act
kg	kilogram
KSG	Climate Protection Act
kWh	kilowatt-hour
LCA	Life Cycle Assessment
N_2O	Nitrous oxide
NF_3	Nitrogen trifluoride
PCF	Product Carbon Footprint
PDCA	Plan, Do, Check, Act
PREXT	Production Excellence Training
RCPs	Representative Concentration Pathways
SBTi	Science Based Targets Initiative
SFDR	Sustainable Finance Disclosure Regulation
SF_6	Sulphur hexafluoride
SSPs	Shared Socioeconomic Pathways
TCFD	Task Force on Climate-related Financial Disclosures
TEHG	Greenhouse Gas Emissions Trading Act
UBA	German Environment Agency (Umweltbundesamt)
VALERI	Assessment of energy efficiency measures using the net present value method (DIN EN 17463)
VCS	Verified Carbon Standard
VSME	Voluntary Sustainability Reporting Standard for SMEs
WBCSD	World Business Council for Sustainable Development

1 Why climate management is essential

1.1 The climate policy significance of climate management 2

The year 2024 marks an alarming wake-up call: it was the warmest year since weather records began – with a global average temperature already 1.5 °C above pre-industrial levels. Europe is particularly affected: the continent is warming twice as fast as the global average. As **temperatures rise**, **climate risks** are also increasing dramatically – extreme weather events such as heatwaves, floods and storms are becoming more frequent and are causing increasing economic damage (see Copernicus Climate Change Service (C3S), 2025)

For **businesses**, this means it is high time to act. Not only do they contribute significantly to greenhouse gas emissions (GHG**{**xe "THG" \t "*Treibhausgas*"**}** -**{** XE "THG" \t "*Treibhausgas*" **}** emissions) in Germany (see Harthan et al., 2024), but they are also among those affected by the consequences of climate change (the next info box explains that climate management is more than just climate protection). Production losses, disrupted supply chains and rising energy and raw material prices are just some of the economic risks that companies are increasingly facing (see Bundesvereinigung Logistik (BVL) e.V. & KPMG AG Wirtschaftsprüfungsgesellschaft, 2024; World Economic Forum, 2024)

The World Economic Forum now also ranks climate risks among the greatest global threats – both economically and socially. In its latest risk assessment, climate-related hazards such as extreme weather events, biodiversity loss, the overshooting of planetary boundaries and resource scarcity feature at the top of the list of the greatest global risks over the next ten years (, see World Economic Forum, 2025)

A wide range of legal requirements obliges companies to take responsibility and systematically integrate climate protection – and, increasingly, climate adaptation – into their strategies. These include, amongst others:.

- The **European Green Deal**, with its central target of climate neutrality by 2050, and the Climate Protection Act (KSG**{**xe "KSG" \t "Klimaschutzgesetz"**}**)**{** XE "KSG" \t "Klimaschutzgesetz" **}** in Germany.
- The Climate Adaptation Act (KAnG), which for the first time prescribes a nationwide climate adaptation strategy with concrete implementation measures and thus also places a greater obligation on companies to take climate resilience into account in their planning and operations,
- as well as the **European Emissions Trading Scheme (EU ETS{**xe "**EU-ETS**" \t "europäische Emissionshandel"**}**)**{** XE "**EU-ETS**" \t "europäische Emissionshandel" **}** as a market-based instrument for reducing greenhouse gases,
- the EU Taxonomy for assessing economic activities in relation to sustainability,
- the **Corporate Sustainability Reporting Directive (CSRD**;**{**xe "**CSRD**" \t "Corporate Sustainability Reporting Directive"**}**)**{** XE "**CSRD**" \t "Corporate Sustainability Reporting Directive" **}** with uniform disclosure standards for large companies,
- the Industrial Emissions Directive for regulating emissions from industrial installations,
- the Energy Efficiency Directive and the German **Energy Efficiency Act** (**EnEfG{**xe "**EnEfG**" \t "Energieeffizienzgesetz"**}**) derived from it,**{** XE "**EnEfG**" \t "Energieeffizienzgesetz" **}**

Climate management is therefore no longer just an option, but an obligation – it is becoming a strategic necessity for every forward-looking company.

Info box: Climate management is more than just climate protection

Climate management encompasses **climate protection**, but also the **management of climate risks** and **climate adaptation**. In addition **to avoiding GHG emissions** and other negative impacts on the climate, a climate management system has the following functions:

- to mitigate **transition risks** for the organisation or to capitalise on corresponding **opportunities**,
- to mitigate **the physical risks of climate change** for the organisation and to capitalise on corresponding opportunities,
- achieve **climate targets**,
- to reduce **energy consumption** and increase energy efficiency,
- to avoid the displacement of GHG emissions to other actors, as well as negative impacts of climate management on other environmental media, human rights and social issues

1.2 What you can expect from this guide

This guide is designed to support companies on their path to a systematic and effective climate management. The focus is on embedding climate-related targets and measures at management level – as a central component of sustainable, i.e. forward-looking, corporate governance.

In addition to reducing greenhouse gas emissions, there is an increasing focus on adapting to the consequences of climate change and to changing legal and market conditions. The guide helps companies to continually and systematically identify and assess climate risks, and to derive appropriate adaptation measures from them.

The guide offers practical assistance to enable organisations to meet growing legal requirements and the expectations of customers, investors and other stakeholders regarding climate protection and climate adaptation. It supports companies in introducing effective climate management – from organisational structure and GHG emissions accounting to internal and external communication and independent verification. In addition to specific recommendations for action, the guide also contains practical examples, checklists and other helpful materials that facilitate implementation in day-to-day business operations.

The guide takes into account established national and international standards for environmental and energy management as well as greenhouse gas neutrality (GHG neutrality) and brings these together into an integrated climate management framework. The frameworks considered include, amongst others:

- the **Greenhouse Gas (GHG) Protocol**[1] as the world's most widely used standard for accounting for GHG emissions,
- **ISO 14064-1:2018** on the quantification and reporting of GHG emissions at organisational level,

[1] The GHGP is a collection of various standards for GHG accounting. The most relevant for this guide are the Corporate Standard and the Corporate Value Chain (Scope 3) Standard, as well as the Scope 2 Guidelines for the accounting of electricity and district heating. These standards are currently being revised and updated (until 2027). The GHGP and ISO have announced that they will harmonise their greenhouse gas accounting standards by 2027.

- **ISO 50001:2018**, which defines the requirements for a systematic energy management system,
- **ISO 14001:2015** for a comprehensive environmental management system,
- further ISO standards on carbon neutrality (ISO 14068-1:2018) and net zero (ISO 14060 under development),
- **ISO 14090:2019** on support for climate adaptation,
- **ISO 14091:2021**, which provides guidelines for assessing risks associated with climate change,
- as well as the **Eco-Management and Audit Scheme (EMAS)** as a voluntary EU environmental management tool.

Annex A.2 provides an overview of legislation, standards and norms that are essential for climate management within a company.

By taking the requirements of these standards into account, the guide provides reliable guidance for companies wishing to address climate protection and climate adaptation strategically and integrate them permanently into their business processes.

Info box: Definitions of terms: Climate neutrality vs. greenhouse gas neutrality

Climate neutrality is a condition in which human activities have no net impact on the climate system. These activities include climate-relevant emissions, measures aimed at removing greenhouse gases from the atmospheric cycle, and human-induced activities that have regional or local biogeophysical effects (e.g. changes in surface albedo). GHG neutrality, by contrast, means 'only' offsetting GHG emissions through GHG removals of equal magnitude. Accordingly, the goal of climate neutrality requires a different and more ambitious policy than the goal of GHG neutrality, as, in addition to GHG emissions, all other effects of human activity on the climate must be taken into account, e.g. changes in land use or land sealing. Outside scientific discourse, e.g. in political debates, 'climate-neutral' and 'greenhouse gas-neutral' are often treated as synonymous. This publication uses the term 'greenhouse gas-neutral' unless the specific name of an initiative or campaign is used or legal formulations are quoted.[2]

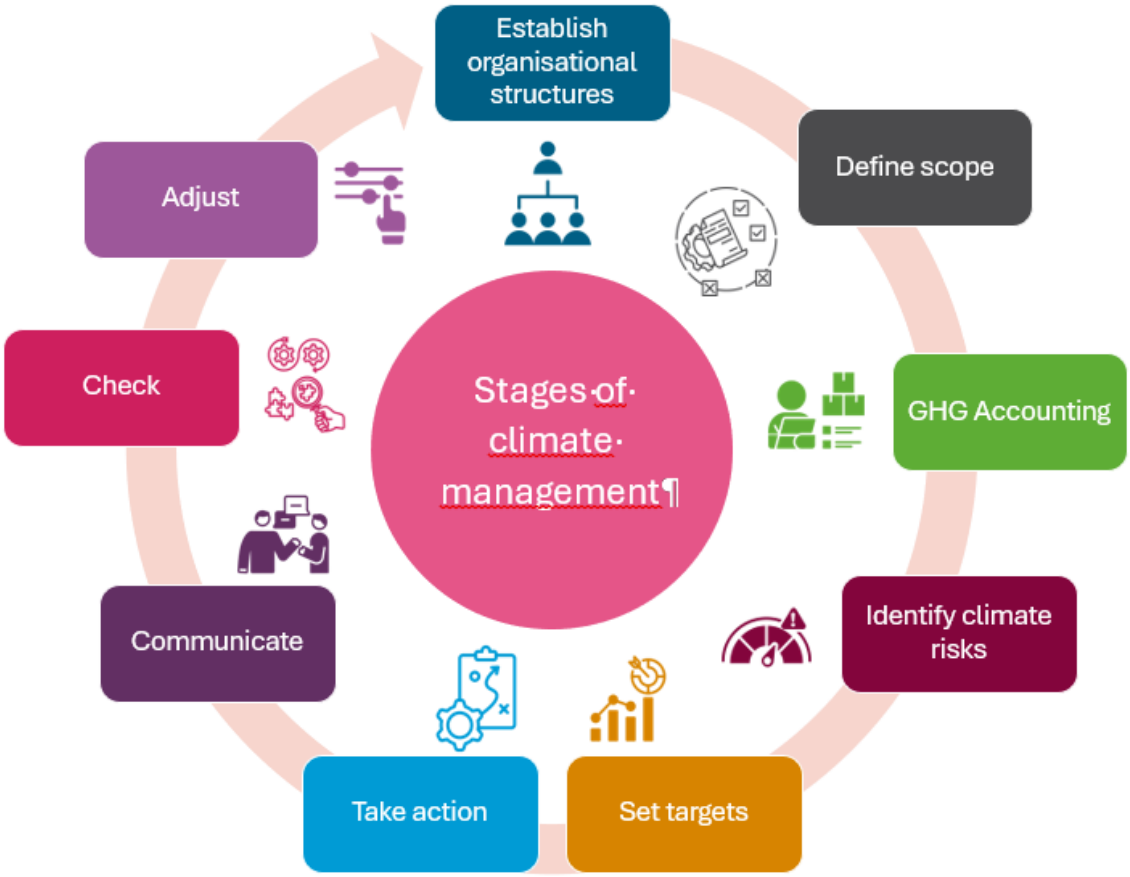
2 Definition according to Huckestein (2021)

1.3 The nine stages of climate management

Background: Definition of climate management and underlying catalogue of requirements

- In this guide, climate management refers to the **entirety of structures, processes and measures** by which an organisation manages its **climate impacts** and **climate risks** in order to implement its strategies and achieve its objectives. It is based on a **catalogue** of requirements for transparent and verifiable climate management based on EMAS, developed by the Federal Environment Agency. This catalogue of requirements divides climate management into a total of eight stages, which – supplemented by a stage on climate risk analysis – this guide also follows. The requirements for each stage are set out at the beginning of each chapter of this guide. The complete catalogue of requirements can be found in **Annex A.3** .

Figure 1 : Structure of the guide



Source: Own illustration

In the first stage **– establish organisational structures within** the company – responsibilities are established at management level and roles for the various aspects are defined. In addition, processes, participation and decision-making rules are defined to lay the foundations for all subsequent stages of climate management. The second stage – **define scope** – involves setting the system and accounting boundaries. The system boundary specifies the areas, sites and buildings to which climate management applies. The accounting boundary determines which GHG emissions and climate risks are included. In the third stage – **GHG accounting** – the relevant data is collected and GHG emissions and climate risks are determined. The fourth stage involves the early identification and addressing of **risks and opportunities**.

The fifth stage – **set targets** – involves establishing company-specific, verifiable targets. In the sixth stage, concrete **measures** are then planned, decided upon and implemented to achieve the set targets. The seventh stage also covers internal and external **communication** regarding all aspects and processes of climate management.

The **check** or review, as the eighth stage, outlines how compliance with the requirements of all stages is verified and ensured. Finally, in the last stage, the previous stages are **adjusted** and adapted on the basis of the insights gained and changes in the operating environment.

2 Establish organisational structures – defining responsibilities, procedures and decision-making rules

Establish the organisational structures: How do I use this chapter?

- This chapter explains how **roles and responsibilities** are defined and how tasks are assigned within the organisation, and provides practical guidance on putting together a **climate team**.
- It highlights the importance of a corporate climate policy and provides guidance on procedures and rules for relevant decisions.
- It describes how the context of the organisation can be assessed and how the stakeholder and environment analysis can be carried out. In doing so, relevant topics, individuals (or groups) and requirements are identified and evaluated.

Underlying elements in the requirements catalogue (see Annex A.3)

- roles and responsibilities (see requirement 2.3)
- Responsibility of top management (see requirement 2.1)
- Top management's commitment to climate action and climate adaptation (see requirement 2.2)
- Involvement of employees (see requirement 2.4)
- Context analysis (see requirement 1.1)
- Management system (see requirement 1.3)

2.1 Roles, responsibilities and authorities within the organisation

The structure of the organisation forms the basis for successful climate management. To this end, the responsibilities and authorities between top management, the climate team and the entire workforce must be defined.

2.1.1 Top management

Top management plays an essential role, as it allocates financial and human resources based on the information available to it and makes strategic and organisational decisions. Top management serves as a role model and should significantly influence the development of climate management through its own guidelines or binding decisions. Senior management is therefore responsible for ensuring that climate protection and climate adaptation are incorporated into the organisation's general strategies, objectives, risk management, financial planning and capital investments. It also ensures that results are achieved with regard to the management system, including the continual improvement of climate-related performance.

Practical tip: Management plan

When introducing a climate management system, it is advisable to draw up a management plan and set out the tasks, responsibilities and authorities with clear powers within it. A climate management officer should be appointed to take on the role of coordination.

2.1.2 Delegation: Climate Team

However, senior management does not need to be concerned with the entire implementation and execution of a climate management system. Instead, it can be helpful to delegate tasks and duties to other people. Depending on the size of the organisation, it may be beneficial to set up a **'climate team'**, in reference to the energy team specified in ISO 50001:2018. The organisation and coordination of such a team should be carried out by a **climate coordinator**. This role should be officially appointed and adequately communicated within the organisation; it can be fulfilled by a position created specifically for this purpose, but may also be delegated to existing roles, such as the energy, environmental or sustainability officer or coordinator. Tasks and responsibilities should be clearly defined in a job description and established independently of the individual's other responsibilities and tasks. It is important, however, that sufficient expertise and time are available to fulfil the tasks associated with the role, or that these are made available by senior management.

As aspects of climate management affect various departments and organisational units within the company, it makes sense to involve the most relevant departments in the climate team. These relevant areas of responsibility should be identified and documented in advance and incorporated into the planning process. Within the team, for example, the areas of energy management, facility management, and environmental or sustainability management can be represented by appropriate individuals or specialists. If existing management systems are already in place (e.g. energy management system, environmental management system, etc.), synergies can be exploited by involving the persons responsible for these systems, who generally have similar tasks.

When putting together the climate team, the following criteria should be taken into account:

- Interdisciplinarity and diversity (different departments and hierarchical levels)
- Expertise: depending on the specific requirements
- Commitment and awareness: active support for climate management
- Communication: good communication skills to ensure effective communication and information flow

If the company does not have sufficient resources or expertise, external parties, such as consultants, may be brought in in exceptional cases. However, it is recommended that the climate team be staffed with internal personnel.

Subsequently, **the roles, responsibilities and authorities,** as well as the **nature of the collaboration**, must be defined. These should be **recorded** formally. In accordance with ISO 50001:2018, the responsible persons must be defined for the following areas:

- Ensuring the implementation, realisation, maintenance and continual improvement of the climate management system
- Ensuring that all requirements, such as climate targets, are met
- Implementation of planned measures

- Reporting to top management
- Establishing criteria and procedures for the effective operation of the climate management system

Accordingly, the necessary competencies must be in place and the relevant authority must be granted by top management. If not all the necessary competencies are available, top management is required to provide appropriate training and further education. This applies not only to the climate team itself, but also to individuals with a significant influence on environmental aspects within the organisation (see Chapter 6).

Good practice example: EMAS-integrated climate management at Stadtwerke Karlsruhe

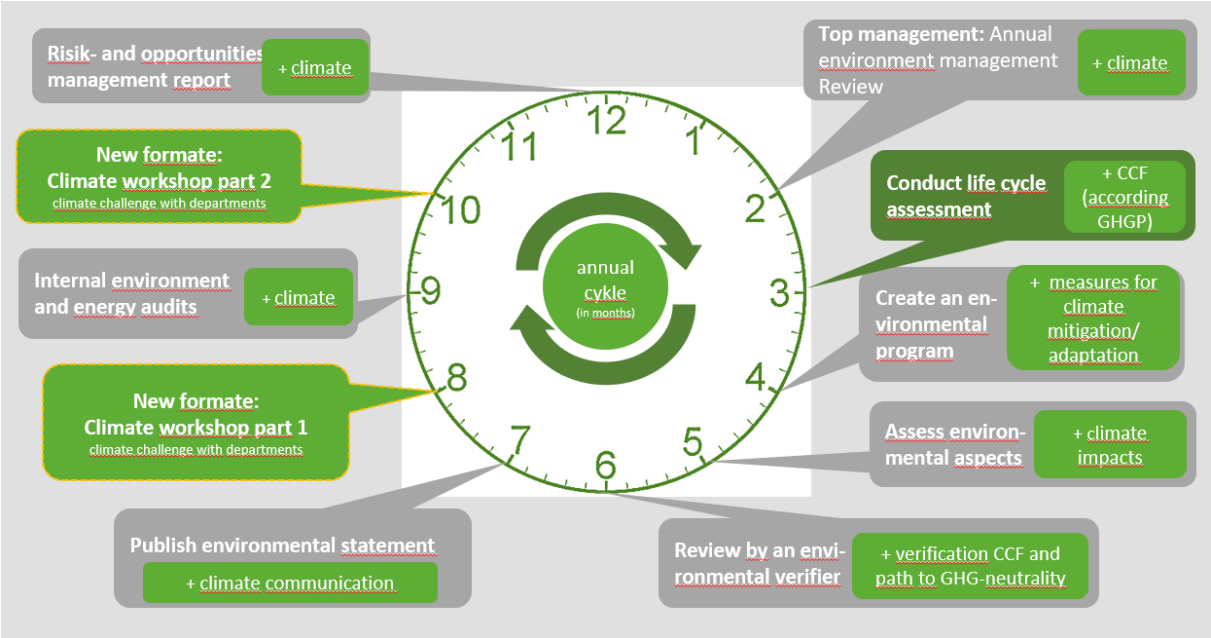
Karlsruhe Municipal Utilities has been EMAS-certified since 1996 and is thus an early pioneer in environmental management: it was the first energy supplier in Baden-Württemberg to achieve this certification. Since 2007, it has reported on topics ranging from global climate change to local climate protection in its annual environmental statement – the so-called Climate Report. In 2021, Stadtwerke Karlsruhe set itself ambitious climate targets: it aims to operate in a greenhouse gas-neutral manner by 2040. This target was defined as one of four 'key targets'.

To implement this, the integration of climate management into the existing, established and actively practised EMAS system began in 2023. The pragmatic, integrative approach chosen for this allows climate management to be made tangible, thereby promoting acceptance and strengthening participation. In line with the motto "keep it simple", the classic EMAS modules are supplemented with climate components and structured using a "monthly clock", as shown in Figure 2.

At the start of each year, the environmental management review takes place with senior management, conducted in accordance with the EMAS Regulation. During this review, developments from the previous year are analysed, climate-related issues are discussed and, where necessary, corrective actions are decided upon. As part of the life cycle assessment data collection process, GHG inventories are compiled in accordance with Scope 1–3, an environmental and climate programme is adopted and validated by environmental verifiers. GHG inventories and the roadmap to climate neutrality are regularly reviewed. Following a successful review, the environmental statement is published, in which climate issues are communicated transparently. In addition to the annual internal environmental audits in late autumn, climate issues have been integrated and a new format introduced: the 'climate workshops'. In these workshops, departments with high emissions discuss their climate protection measures, identify gaps and determine the next steps. At the end of the year, opportunities and risks, including climate risks, are assessed and compiled in a report. This closes the annual cycle and enables targeted management of climate and environmental initiatives.

Further information can be found at: www.stadtwerke-karlsruhe.de/de/unternehmen/umwelt-und-klima/umweltschutz.php

Image2 : "monthly clock" climate management scheme at Stadtwerke Karlsruhe



Source: Own illustration

2.1.3 Involvement of employees

Employees with a **relevant influence** on binding requirements relating to climate aspects must be actively involved in the climate team and the corresponding processes of the management system. The same applies to external service providers and contractors, insofar as they carry out climate-related activities or contribute to the management of climate impacts, risks and opportunities.

Employees relevant to climate management can be identified on the basis of their specific tasks and responsibilities. To enable employees to fulfil their tasks and activities within the framework of climate management, they must have or be given the necessary responsibilities and competencies. This applies both to the potential individuals or roles within the climate team (see chapter 2.1.2) and to all other identified individuals with relevant influence. These tasks and required competencies should be clearly documented and communicated.

Building on this, it must be assessed to what extent the necessary competencies are already in place or still need to be developed or built up through training. The classification of staff in terms of existing competencies may change, e.g. due to training or experience; therefore, competencies should be reviewed regularly and updated where necessary.

Practical tip: Competency matrix and training plan

In practice, the creation of a competency matrix has become established, in which the relevant activities and the competencies required for them are listed, and the relevant individuals are classified on this basis (e.g. various levels ranging from 'training commenced' to 'can train others'). A training plan can then be derived from this classification.

There are various ways to involve other **staff members** who have **only a minor influence on climate aspects**. Firstly, an employee representative for the climate management system (e.g. an environmental officer with a staff role, works council member or employee spokesperson) must be appointed, and this person should be involved in relevant decisions. To this end, a specific process must be developed that allows for employee input and participation. It is also

important that all employees are informed about the company's climate policy (see chapter 2.2) and also the objectives and benefits of the climate management system (see chapter 8.2). A company-wide suggestion scheme also offers employees the opportunity to submit suggestions, which are reviewed and – where appropriate – implemented. Furthermore, such processes can be encouraged through incentive schemes.

Practical tip: Process for employee involvement and participation

Employee involvement can be achieved through various options. Some practical examples are listed below:

- Company suggestion scheme (including review of suggestions and, where appropriate, implementation)
- Incentive schemes for positive behaviour (e.g. financial rewards, team events)
- Project-based group work
- Establishment of a climate committee

2.1.4 Management review

To ensure that senior management can fulfil its obligations and is kept up to date on climate management, a **management review** is conducted regularly.

Practical note: Agenda and content of a management review

The content of the management review could be based on the guidelines set out in Chapter 9 of the ISO standards (ISO 50001:2018 or ISO 14001:2015) and should also include the specific requirements of climate management:

1. Status of actions and decisions from previous management reviews
2. Changes in external and internal issues (context of the organisation) and associated risks and opportunities affecting climate management
3. Information on the performance of the climate management system, including developments regarding
   a.) non-conformities and corrective actions
   b.) Results of monitoring and measurement
   c.) audit results
   d.) Results of the assessment of compliance with legal and other requirements
4. Opportunities for continual improvement, including with regard to competence
5. Climate policy

Practical note: Risk management measures

Even prior to the management review, existing risk management measures and the handling of opportunities and risks should be systematically compiled and made available to senior management as a basis for decision-making, in order to enable well-informed and accelerated decision-making.

2.1.5 Transition plan

The organisation must draw up, implement and regularly update a transformation plan. In doing so, the organisation ensures that its strategy and business model are compatible with climate policy objectives and the transition to a sustainable economy.

The transformation plan covers both climate mitigation and climate adaptation:

- a 1.5°C-compatible GHG emissions reduction pathway for the organisation, against which the organisation's climate targets are aligned;
- measures leading to the decarbonisation of the organisation
- dealing with 'locked-in' emissions
- an investment strategy for implementing the transformation plan
- a strategy for addressing potential negative impacts on the company's employees and those in the value chain.
- a systematic analysis of climate-related physical risks and adaptation needs (e.g. due to extreme weather, heat, water scarcity or supply chain disruptions);
- Measures to strengthen the climate resilience of sites, processes, infrastructure and supply chains, and to capitalise on potential adaptation opportunities
- taking climate adaptation aspects into account in investment decisions and long-term site and infrastructure planning.

Furthermore, the transformation plan must be embedded in the business strategy and include a commitment that the organisation will offset unavoided GHG emissions in the target year through carbon removal measures. **However, the priority is the reduction of GHG emissions.** At the same time, adaptation measures must be designed in such a way that they do not undermine climate protection measures (avoidance of maladaptation).

The transformation plan should:

- be kept constantly up to date and be detailed enough to allow progress to be tracked
- outline the pathway from the current status to the long-term targets
- clearly identify and prioritise responsibilities and financial resources for the measures
- regularly assess **the** effectiveness of the measures in relation to the long-term goals
- regularly review the development of climate-related risks, vulnerabilities and resilience, and update adaptation measures accordingly.

Transition plans should be based on recognised standards and guidelines to ensure credibility and comparability. Important references and guidance can be found here:

- ESRS E1-1: Climate Action Transition Plan
- Climate management requirements catalogue (see Appendix A.3)
- ISO 14068-1: Climate change management – Transition to net zero – Carbon neutrality

- ISO 14002-3: Environmental management systems – Guidelines for the use of ISO 14001 to address environmental aspects and conditions within an environmental subject area – Part 3: Climate
- Climate neutrality plans in the EU Emissions Trading Scheme: Templates from the DEHSt
- Information sheet "Module 5 – Transformation Plan" from the Federal Funding Programme for Energy and Resource Efficiency in the Economy

The importance of transformation plans will increase significantly in the coming years, and they will become a key component in achieving climate neutrality and complying with international standards.

2.2 The company's climate policy

As with energy policy (ISO 50001) and environmental policy (ISO 14001 / EMAS), the framework of the climate management system is formed by a climate policy and thus embedded within the company. For climate management, the climate policy should, in addition to general statements, place particular emphasis on as specific as possible guidelines regarding the timing and targets for the transition and, where possible, already include concrete guidelines and overarching levers. Linking and coordination with other policies is possible in order to exploit synergy effects.

Practical example from MVV Energie AG

"MVV Energie AG pursues a comprehensive hydrogen strategy that serves as an integral part of its environmental and climate protection policy. The aim is to drive decarbonisation in various sectors through the use of green hydrogen and to achieve a climate-positive balance by 2035" or "MVV aims to supply 100 per cent green district heating across the group by 2035"

Senior management is committed to the following points:

- Working towards compatibility with the **1.5-degree target** as an overarching climate goal and alignment with the climate policy objectives of Germany and the EU derived from it
- Collecting climate-relevant **corporate data**
- **Fulfilment of binding obligations** with reference to compliance with the legal framework regarding climate, energy and the environment
- **Appropriateness** in relation to the organisation's purpose and context
- **Continual improvement** through **the reduction** of its own **climate impacts**
- Provision of **financial and human resources**
- Improving the company's **resilience** to the potential impacts of climate change
- Management of the **organisation's** climate-related **risks and opportunities**
- Availability as documented information that is communicated within the organisation and made available to interested parties
- In addition, a transformation plan may be drawn up (see Chapter 2.1.5 and Requirements 2.2 of Annex A.3), which should be implemented and regularly updated.

2.3 Context of the organisation: Environmental analysis

To gain a good understanding of one's own organisation and to determine the context of the organisation, relevant topics, individuals (or groups) and requirements are identified as part of an environmental and stakeholder analysis. If a corresponding analysis already exists as part of another management system, it need only be expanded to include the topic of climate. For organisations without an established management system, this aspect is usually found in the corporate strategy and should be supplemented here with climate aspects. (DENEFF, GUTcert, ÖKOTEC, 2021)

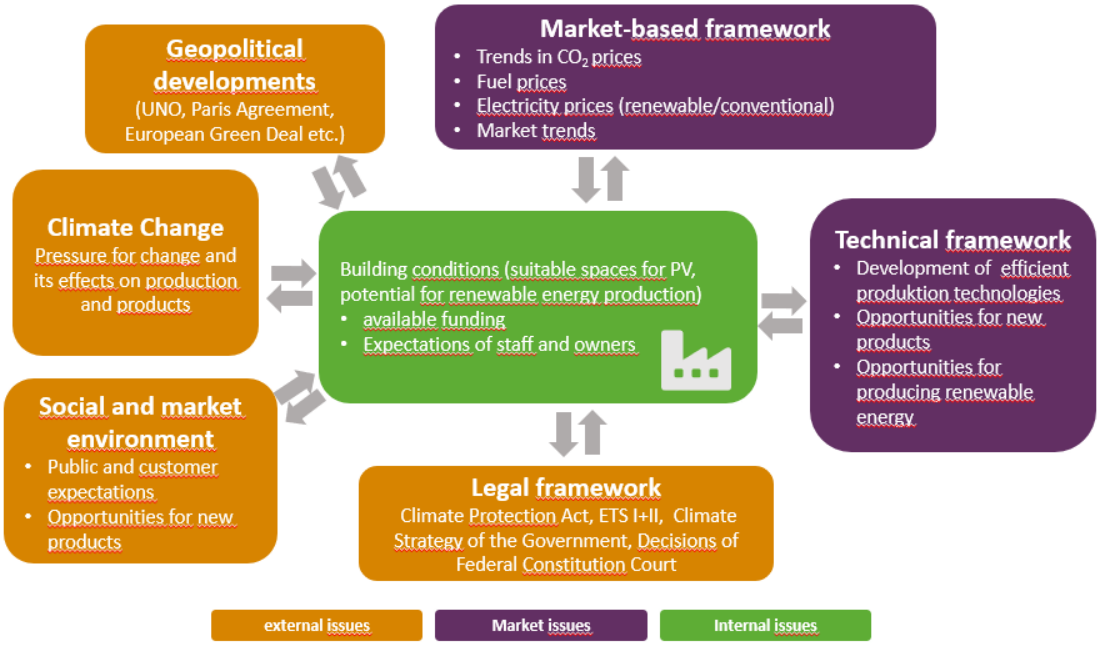
Context analysis: Understanding the organisation and its context

Within the framework of environmental management systems according to ISO 14001 or EMAS, the context analysis is understood as the systematic identification and evaluation of the organisational context, i.e. those internal and external factors that may influence the intended outcome of the environmental management system. These factors may affect the organisation from the outside, such as the market and competitive situation, societal expectations or customer and supplier relationships, or they may be relevant within the organisation, such as structures, capabilities, knowledge and competencies.

In the context of climate management, the context analysis therefore involves understanding the climate impacts the organisation has, and how the transition to a greenhouse gas-neutral, 1.5°C-compatible society and the consequences of climate change may affect its activities, products and services, including its business model and business relationships. This may result in significant changes to energy supply, supply and logistics structures, and the product portfolio in the future. Such changes do not occur exclusively directly – for example, through the transition from fossil fuels to renewable energy sources – but also indirectly, e.g. through increasing electrification, new circular economy models, impacts on production processes or raw material requirements.

Consequently, the following internal and external climate-related issues, among others, should be assessed; these may vary depending on the organisation's activities:

Figure3 : Overview of potential internal and external issues that may influence climate management



Source: Own illustration

Practical tip: PESTEL analysis for identifying external issues

A method frequently used in this context is the PESTEL[3] analysis, which categorises external influencing factors into six different areas: political, economic, socio-cultural, technological, environmental and legal. It is advisable to distinguish between influencing factors **within the value chain**, such as changes in logistics structures, resource scarcity or recycling concepts, and factors **outside the value chain that have an indirect impact**, e.g. changes in consumer behaviour and industrial, energy or environmental policy frameworks.

The insights gained from this can be used to define the relevant legal framework and, furthermore, to incorporate additional context-relevant information on the organisation's climate impact, such as a review of media reports, industry benchmarks, sustainability trends and scientific articles on GHG accounting and its effects. Among other things, the findings on the impact of black carbon (soot) in aviation would need to be taken into account (Manders et al. (2024)).

As a complementary approach, an assessment of the company's various impacts on climate change should be carried out. A distinction must be made between the climate impacts emanating from the company on **external processes and actors** ('inside-out') and the climate impacts affecting **the company** from **the outside** ('outside-in'). In the former case, climate conditions influenced by the organisation must also be included. In the latter case, the focus is on which external factors can influence the company. For both perspectives, the aim is to identify the (potential) impacts of these issues on climate management and to analyse the resulting opportunities and risks regarding climate impact.[4] The *Corporate Sustainability Reporting Directive (CSRD)*

[3] PESTEL – political, economic, social, technological, environmental, legal

[4] According to climate management, climate impacts are defined as "negative contributions of an organisation's activities, products and services to climate change through the emission of greenhouse gases or other activities that may have a warming effect on the Earth's climate system, e.g. the emission of water vapour".

requires the conduct of a **dual materiality analysis**. Two perspectives must be taken into account:

- **financial materiality** (the influence of sustainability-related issues on the company), such as rising CO_2 prices, stricter environmental regulations or extreme weather events affecting the company's finances, and
- **impact materiality** (the company's impact on the environment, society and climate), such as a company's GHG emissions, water consumption or waste production.

Both dimensions should be systematically analysed and documented. For a climate management system, financial materiality must take into account not only direct financial effects, such as CO_2 prices, but also indirect influences of climate-related changes on the company, e.g. temperature changes or extreme weather events, or the company's dependencies, e.g. on fossil fuels, infrastructure or vulnerable supply chains, must be taken into account as climate risks and opportunities. In the context of reporting in accordance with the European Sustainability Reporting Standards (ESRS) under the CSRD, various guidelines have been published for conducting the materiality analysis.[5]

Environmental analysis: Understanding the requirements and expectations of stakeholders

The organisation's ability to take the best possible account of and reconcile the interests and needs of all stakeholder groups is regarded as a prerequisite for the sustainable success of climate management. To this end, the relevant stakeholders, as they are referred to in common management system standards, must first be systematically identified and analysed in terms of their influence on the identified climate impacts. For a climate management system, climate impacts can be classified according to the emission categories Scope 1 to 3 (further information on this in Chapter 4), so that the classification can be incorporated into the materiality assessment of indirect emissions from Scope 3.

This means that the requirements and expectations of relevant parties regarding climate protection and climate adaptation must be recognised and assessed. The aim is to determine the relevance of individual stakeholders and to identify the influences, impacts, opportunities and risks they present for climate management. Binding obligations arising from legal requirements or contractual agreements should be given particular attention.

Overall, not only current expectations but also future expectations regarding ongoing transformation and the associated decarbonisation should be taken into account. For example, the question of whether 'greenhouse gas-free' production must be achieved exclusively through internal emission avoidance or whether the use of Carbon credits is also permissible could have a significant influence on the strategic design of the climate management system.

The materiality of stakeholders for climate impact can vary greatly depending on the organisation's activities and sector; however, the internal and external stakeholder groups listed in Table 1 can generally be classified as particularly relevant for a climate management system.

[5] Quick guide to conducting a materiality analysis in accordance with the ESRS of the German Sustainability Code (DNK) Link

Table 1 : Stakeholder groups for a climate management system

	Stakeholder	Impact on direct or indirect emissions (Scopes)	Requirements and expectations regarding climate protection and climate adaptation (among others)
Internal stakeholders	Employees, works council / staff representatives	Scope 1, and to some extent Scope 3, through their own behaviour (commuting, business travel, material consumption) and the implementation of climate policy in procurement	Concrete measures, e.g. CO_2 reduction, sustainable procurement, green transport, energy efficiency, transparent implementation of action, climate and climate protection programmes, opportunities for participation and creating a sense of purpose
	Executive Board / Management	Scope 1–3 through climate policy and strategic decisions (e.g. energy procurement, purchasing guidelines, implementation of measures)	Integration into corporate strategy, competitiveness, long-term perspective and innovation (results and key performance indicators), employee motivation and employer attractiveness
	Persons responsible for the climate management system	Scope 1–3 through the determination of climate impact and the development of the action, climate and climate protection programme	Clear climate policy as a basis for decision-making, competencies, qualifications and powers, efficient procedures through integration into management systems, reliable data and measurable targets, cooperation and awareness among staff
External stakeholders	Public / society (local residents, environmental groups, NGOs)	Indirect Scope 2–3 through transparency and reporting requirements as well as legal provisions	Credibility and transparency (complete determination of GHG emissions, transparent climate targets and key performance indicators, implementation of measures), external verification, dialogue and participation, climate-friendly products and services
	Customers / consumers (B2B/end customers, clients)	Scope 1–3 through environmental requirements for products and services	Climate-friendly products and services, transparent and credible information (e.g. labels, verified GHG accounting or participation in initiatives), dialogue, participation and customer focus, reasonable pricing, compliance with standards and laws
	Suppliers & service providers (raw material suppliers, contractual partners, subcontractors)	Scope 3 through the implementation of procurement guidelines based on environmental requirements	Uniform and implementable procurement guidelines on climate protection, uniform standards, cooperation and knowledge transfer in the development of action programmes, communication and transparency, contractual agreements

Following the initial analysis of stakeholder requirements, regular updates at defined intervals are necessary to adequately account for changed conditions and current developments. In doing so, not only the current situation at the company's sites but also planned operational developments and the use of environmental resources by third parties in the immediate vicinity should be systematically included in the assessment.

Furthermore, the intended use of climate management should always be taken into account when assessing stakeholder expectations. This is because the decision as to which direct and indirect emissions are to be classified as particularly relevant depends on this. For example, the emissions contribution from lithium mining may, as a volume-based criterion, represent only a small proportion of total GHG emissions overall, whilst the stakeholder group 'public/society' may nevertheless attach high relevance to it due to the ecological consequences of lithium mining.

Info box: Have all stakeholder groups been identified and updated?

In the modern debate on sustainability and ESG, nature is increasingly regarded as a legitimate stakeholder group, even though it cannot speak or negotiate for itself. Companies, particularly in the context of standards such as the ESRS, the Global Reporting Initiative (GRI**{** XE "GRI:Global Reporting Initiative" **}**), the German Sustainability Code (DNK)**{** XE "DNK:Deutscher Nachhaltigkeitskodex" **}** or when developing ESG strategies, are increasingly being called upon to incorporate the interests of the natural environment into their decision-making processes.

This could, for example, be done by introducing an internal, notional CO_2 price for direct and indirect climate impacts, which the organisation sets itself independently of existing emissions trading schemes. Alternatively, area- or species-based indicators can be developed to form a biodiversity index that reflects the changes caused by the organisation. Similarly, action-based targets can be defined – such as supporting projects to improve water quality or increase recycling rates.

Other external stakeholders:

Further illustrative overviews can be found in the organisations' published EMAS environmental statements or sustainability reports. Customers/end-users and legislators/authorities often represent the most influential stakeholder group with regard to climate impacts.[6]

[6] p. 144 of the Volkswagen Group Annual Report (Link) or Bauck GmbH's EMAS Environmental Statement 2022/2023 (Link)

3 Defining the scope – setting organisational and operational boundaries

Scopes: How do I use this chapter?

- This chapter explains how the scope for climate management is defined,
- which organisational boundaries apply to greenhouse gas accounting and climate risk analysis,
- to which aspects, business areas, sites and organisational units climate management applies,
- and which climate risks are considered.

Underlying elements in the requirements catalogue (see Annex A.3)

- Defining the scope (see requirement1.2)

The scope of climate management is defined on the basis of the context analysis. The scope should include all activities, products and services relevant to climate protection and climate adaptation, taking into account supply and value chains.

To do this, the **organisational boundary** must first be determined, followed by the **operational boundary**. With the organisational boundary, the company decides which sites, divisions and organisational units to include in its climate management. The operational boundary specifies which climate aspects and areas of action are included in climate management, i.e. which are the subject of the subsequent stages (from the determination of greenhouse gas emissions and climate risks, through targets and measures, to communication, review and adaptation).

3.1 Determining the organisational boundary

The organisational boundary determines which divisions, operations, subsidiaries and associated companies are included in climate management. This applies, for example, to the sites and emissions included in the GHG inventory (see chapter 4) and the areas included in the climate risk assessment (see chapter 5).

The basis for these definitions is provided by the GHG Protocol and the ISO 14064-1:2018 standard. These distinguish between three fundamental approaches:

- *Equity Share Approach*: The company determines the scope of climate management in accordance with its share of the equity in the relevant business activity. This means: what rights and obligations does the company have with regard to the opportunities and risks of a particular area? Normally, this share corresponds to the company's ownership stake in the activity. If, for example, a company owns 40%, it also bears 40% of the risks and receives 40% of the profits. If this is not the case, economic reality always takes precedence over the purely legal form of ownership. This means that the equity share must reflect the actual economic influence. This principle is also laid down in international accounting standards. In cases of doubt, the accounting or legal department can assist in applying the correct percentage for joint activities.
- *Control Approach*: The company includes in its climate management those areas and business activities that it controls. Activities in which the company merely participates, without being able to control or manage them, are not taken into account. Under this approach,

100% of the emissions from the controlled entities are taken into account. A distinction is made between:

- financial control: the ability to determine an entity's financial and business policies. Financial control usually exists where the company bears the majority of the benefits and risks – even if its ownership share is below 50%. The decisive factor is the economic reality, not merely the legal form of ownership. If an entity is fully consolidated in the financial statements, it is considered to be under financial control.
- operational control: the authority to introduce and implement operational guidelines and management practices. In practice, this means that whoever operates the facility (e.g. the licence holder) has operational control. The company then accounts for 100% of the emissions from that facility. Operational control does not mean that the company makes all decisions – major investments often require the consent of all partners. The decisive factor is the ability to set and implement day-to-day operational guidelines.

Choosing between the two approaches is challenging for many companies. The intended use, as well as the requirements of relevant stakeholders or regulators, should always be the decisive factors. In the ESRS, the financial control approach forms the basis and must be extended to include operationally controlled activities. In any case, the choice of system boundary should be transparently documented, justified in a comprehensible manner and maintained in the long term.

3.2 Determining the operational scope

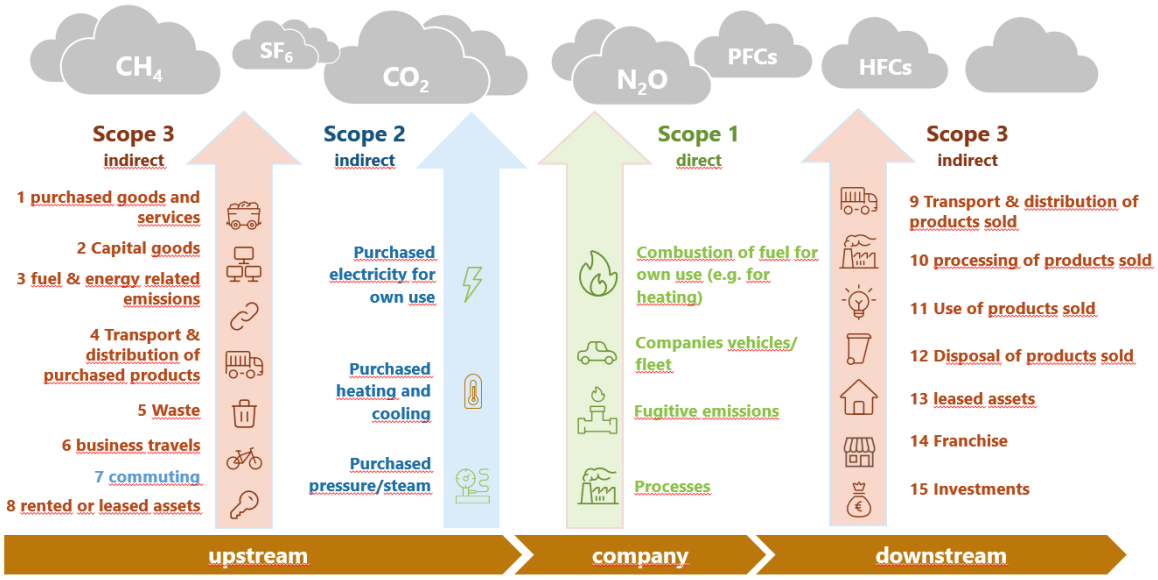
The operational boundary must be defined on the basis of the established organisational boundary. The operational boundary defines which emission categories and climate risks are accounted for, managed, reported and reviewed within the framework of climate management. The steps and methods for determining GHG emissions and climate risks are described in Chapters 4 and 5.

Emissions included in the emissions inventory

The determination of the operational boundary for emissions accounting is based on the guidelines of the GHG Protocol, in line with the accounting process itself, which is described in Chapter 4 . The GHG Protocol generally distinguishes between three so-called scopes. Scope 1 covers direct emissions from sources owned or controlled by the company, e.g. through production processes. Scope 2 includes indirect GHG emissions that arise when companies use purchased energy such as electricity, heat or cooling in their own or controlled facilities or operations. Scope 3 refers to indirect GHG emissions from upstream and downstream processes in the value chain. These emissions originate from sources that are not owned or controlled by the company. Figure 4 shows the classification of company-related GHG emissions into scopes.

The definition of the operational boundary is crucial for the completeness and comparability of the GHG emissions and climate risks included in climate management. Here too, the chosen boundaries must be transparently documented and aligned with the scope of climate management.

Figure 4 : Scopes according to the GHG Protocol



Source: Own illustration based on GHG Protocol: A Corporate Accounting and Reporting Standard

Breakdown of emissions into categories

The GHG Protocol divides emissions reporting into three scopes. ISO 14064-1:2018 distinguishes between direct and indirect emissions across five categories, as shown in Table 2 at .

Whilst direct GHG emissions and indirect GHG emissions from externally procured energy are classified under Scopes 1 and 2 in the GHG Protocol and ISO 14064-1:2018, there are different classifications for other indirect GHG emissions. In the GHG Protocol, other indirect GHG emissions are grouped under Scope 3 and divided into upstream and downstream; in ISO 14064-1:2018, they are divided into categories 3, 4 and 5:

- Category 3: covers indirect GHG emissions from transport,
- Category 4: indirect emissions from products in use, and
- Category 5: indirect emissions from the use of the organisation's products.

The GHG Protocol further subdivides the additional indirect Scope 3 GHG emissions into a total of 15 upstream and downstream emission categories, which are in turn subdivided into even finer categories. Both standards are to be harmonised by the end of 2027.

Table 2 : Comparison of the categorisation of greenhouse gas emissions in the GHG Protocol and ISO 14064-1:2018

GHG Protocol	ISO 14064-1:2018
Direct GHG emissions (Scope 1)	Category 1: Direct GHG emissions and direct GHG removals
Indirect GHG emissions from purchased grid-connected energy (Scope 2)	Category 2: Indirect GHG emissions from imported energy
Scope 3.1: Purchased goods and services	Category 4.1: Emissions from procured goods Category 4.5: Emissions from the use of services
Scope 3.2: Capital goods	Category 4.2: Emissions from capital goods
Scope 3.3: Energy and fuel-related activities	Category 4.1: Emissions from procured goods
Scope 3.4: Upstream transport and distribution	Category 3.1: Emissions from upstream transport and distribution of goods
Scope 3.5: Waste	Category 4.3 Emissions from the disposal of solid and liquid waste
Scope 3.6: Business travel	Category 3.5: Emissions from business travel
Scope 3.7: Commuting	Category 3.3: Emissions from commuter traffic Category 3.4: Emissions from the transport of customers and visitors
Scope 3.8: Rented or leased property, plant and equipment	Category 4.4: Emissions from the use of facilities
Scope 3.9: Downstream transport and distribution	Category 3.2: Emissions from downstream and distribution of goods
Scope 3.10: Processing of sold products	
Scope 3.11: Use of sold products	Category 5.1: Emissions from the product's use phase
Scope 3.12: End-of-life treatment of sold products	Category 5.3: Emissions from the end-of-life phase of the product
Scope 3.13: Rented or leased property, plant and equipment	Category 5.2: Emissions from downstream leased assets
Scope 3.14: Franchising	
Scope 3.15: Investments	Category 5.4: Emissions from investments
Scope 3.15: Investments	Category 5.4: Emissions from investments

Source: GHG Protocol (own translation) and DIN EN ISO 14064-1:2019 (own translation)

Scope of the climate risk analysis

Defining the operational boundary is a key step in identifying the scope of climate management – including the GHG emissions and climate risks to be managed – in a transparent and traceable manner. In particular, the following aspects must be defined:

1. Risks taken into account

Firstly, it must be clarified which types of climate risks are included in the analysis. A distinction is usually made between physical risks (e.g. extreme weather events, rising temperatures, water scarcity) and transitional risks (e.g. regulatory changes, market changes, technological developments in the context of decarbonisation). Depending on the context, the latter may also encompass further risk dimensions such as reputational risks or legal risks.

2. Time periods considered

Climate risks unfold over different time horizons. It is therefore necessary to define the time periods covered by the analysis – e.g. short term (< 5 years), medium term (5 to 10 years) and long term (> 10 years). The choice of time periods should be guided by the organisation's strategic planning and available climate scenarios.

3. Underlying scenarios

Plausible future scenarios must be used to assess climate risks. Internationally recognised climate scenarios such as the IPCC's RCPs (Representative Concentration Pathways) or SSPs (Shared Socioeconomic Pathways) are suitable for this purpose. The choice of scenarios significantly influences the results of the analysis and should be well-founded – for example, by considering a best-case, business-as-usual and worst-case scenario.

4 Accounting – Calculating greenhouse gas emissions

Accounting for GHG emissions and removals[7]: How do I use this chapter?

- This chapter provides an overview of the necessary steps and methods for **accounting for GHG emissions** for companies.
- The approach **is based on the GHG Protocol**. The description does not cover all aspects and detailed questions. Sources for further reference are therefore always provided in the explanations.
- Following the introduction, the chapter provides an insight into **data management** and **data collection** for the calculation of Scope 1, 2 and 3 emissions and the **emission factors** required for this. Examples of **how to present the results** are shown and the assessment of **data quality** is described.

Underlying elements in the requirements catalogue (see Annex A.3)

- Climate impacts (determination of GHG emissions and their sources, GHG emissions accounting, recording of other climate impacts) (see requirement3.1)

4.1 Purpose and scope of GHG accounting

By conducting a comprehensive accounting of its GHG emissions, a company can assess the extent of its dependence on fossil, carbon-based resources and processes. The aim of GHG accounting is to quantify all GHG emissions caused by a company in a given year. The systematic analysis of emissions identifies hotspots and thus also potential opportunities for reducing emissions. The trend in GHG emissions over time can be tracked by accounting for successive years and compared with the reduction targets set.

The GHG inventory is therefore calculated **annually**. **All greenhouse gases** must be taken into account. The results are presented both as **a total figure in CO_2 equivalents** and **broken down by the individual Kyoto greenhouse gases**. In addition to the total result, it should be clearly shown to which **scopes the emissions** are **allocated** and, where possible, a **more detailed breakdown** (for example, by business units, sites or areas of activity) should be provided.

The procedure for accounting for GHG emissions is based on the approach of the GHG Protocol and DIN EN 14064-01:2018. This guide focuses on the requirements of the GHG Protocol, which, for example, is to be used as the preferred method for accounting in ESRS E1 'Climate Change'. The details of the methodology are documented in various standards and guidelines; an overview of these is provided in Table 3. The relevant standards, some of which are more than 20 years old, are currently being revised and are expected to be republished in 2027.

[7] The GHG inventory generally refers to both emissions and removals, even though for most companies only emissions are likely to be relevant.

Infobox: What exactly are GHG emissions? What is behind CO_2 equivalents?

- The Kyoto Protocol lists the following greenhouse gases: carbon dioxide ($_{CO_2}${xe "CO2" \t "Kohlendioxid"}), methane ($_{CH_4}${ XE "CH4" \t "Methan" }), and nitrous oxide (N_2 O{xe "N2O" \t "Lachgas"})) as well as fluorinated greenhouse gases (F-gases{xe "F-Gase" \t "fluorierten Treibhausgase"}): hydrofluorocarbons (HFCs{xe "HFKW" \t "wasserstoffhaltige Fluorkohlenwasserstoffe"}), perfluorocarbons (PFCs{xe "FKW" \t "perfluorierte Kohlenwasserstoffe"}), and sulphur hexafluoride (SF_6{xe "SF6" \t "Schwefelhexafluorid"}). Since 2015, nitrogen trifluoride (NF_3{xe "NF3" \t "Stickstofftrifluorid"}) has also been included.
- The various gases do not contribute to the greenhouse effect to the same extent and remain in the atmosphere for varying lengths of time. To make their effects comparable, greenhouse gases are converted into $_{CO_2}$equivalents ($_{CO_2}$eq.{xe "Äq." \t "Äquivalente"}) according to their global warming potential (GWP{ XE "GWP" \t "Global Warming Potential" }).
- Example: Fossil methane has a GWP of 29.8 kg CO_2-eq. per kg of methane over a 100-year period.
- The GWPs are published in the assessment reports of the Intergovernmental Panel on Climate Change (IPCC) (2023).

Table 3 : GHG Protocol standards relevant to companies' GHG inventories

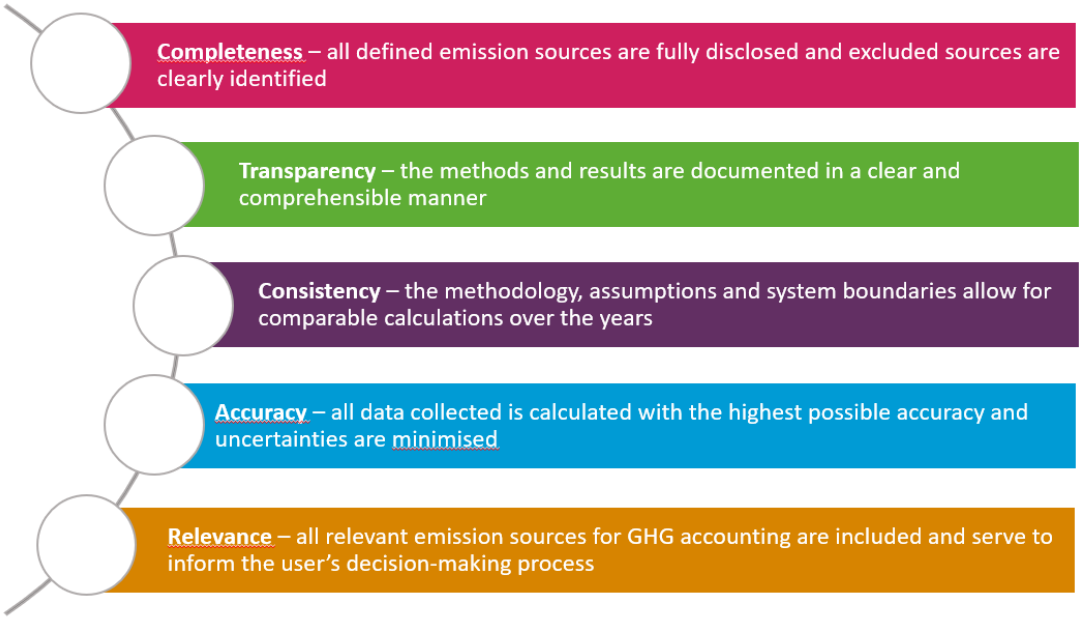
Standard	Explanation
GHG Protocol (2004): A Corporate Accounting and Reporting Standard	Overarching standard for calculating companies' GHG inventories
GHG Protocol (2015): Scope 2 Guidance	Guidance on the calculation of upstream, energy-related emissions
GHG Protocol (2011): Corporate Value Chain (Scope 3) Accounting and Reporting Standard	Standard for all upstream and downstream emissions
GHG Protocol (2013): Scope 3 Calculation Guidance	Detailed calculation guidance for accounting for Scope 3 categories

The collection of emissions is based on the definition of organisational and operational boundaries; see chapter 3. All emissions falling within these boundaries should be recorded.

The following section first explains the **general requirements for accounting**, then outlines the **data** required for accounting and how this is collected. The **presentation of the results** is illustrated using an example. Finally, the analysis and **assessment of data quality** are discussed, as well as the **accounting** for **other climate impacts** (through CO_2 removal or CO_2 sinks) and **biogenic CO_2.**

The inventory is intended to comply with the fundamental principles of GHG accounting (see Figure 5).

Figure 5 : Principles of greenhouse gas accounting



Source: Own illustration based on GHG Protocol (2004): A Corporate Accounting and Reporting Standard

4.2 Data management, data collection and calculation of GHG emissions

In this step, the data for the emissions inventory is collected. This always requires two types of data: consumption or company data (e.g. natural gas consumption in kWh, electricity consumption in kWh, material purchases in kg, etc.) and emission factors (e.g. emission intensity of electricity consumption in kg CO_2eq./kWh).

Practical note: Data types and data gaps

Data can be determined in various ways:

Measurement

- Direct recording of physical values using measuring instruments
- Example: CH_4 measurement in the exhaust gas stream of a plant

Calculation

- Mathematical calculation based on known activity data and emission factors
- Example: Multiplication of gas consumption (kWh) by the specific CO_2 emission factor

Estimation

- Use of assumptions, average values or extrapolations
- Example: Average refrigerant losses from a system

When collecting data, it generally makes sense to utilise **existing structures** in order to minimise the risk of errors and the workload. **Existing management systems** should ideally be utilised or expanded to capture the data. The processes are documented and clear responsibilities

and authorities are defined. For the person responsible for climate management, this means, on the one hand, that existing operational data collection systems must be utilised and, where necessary, expanded, and, on the other hand, that new data sets such as emission factors or supplementary activity data must be integrated.

For the calculation itself, in addition to using spreadsheet programmes, professional software solutions and web tools are available. Emission factors are often pre-programmed into these tools, so that only the company's activity data needs to be entered or transferred automatically. There are freely available, relatively simple tools, as well as commercial software solutions that can be customised for specific companies or purchased alongside consultancy services. Table 4 shows examples of requirements for a GHG accounting tool. These can be used to select a tool.

Table 4 : Example requirements for a tool for greenhouse gas accounting

Category	Requirement
Economic	Set-up costs, e.g. investment in installation, adaptation to business needs
	Monthly/annual fees: Recurring costs
	Other costs, e.g. user-dependent costs, training, upgrades, support
Methodological	Consideration of the GHG Protocol methodology
	Separate presentation of GHG emissions for each Kyoto gas and in tonnes of CO_2 equivalent
	Scope 2: Distinction between location-based and market-based emissions possible
	Determination of Scope 3 possible
	Documentation of data sources possible
	The software's methodology is certified by an independent testing institute
	Reliable, generally recognised sources for emission factors are stored in the tool.
	The underlying emission factors and calculation methods should be stated transparently.
	It is possible to store your own emission factors, e.g. those specific to suppliers.
Technical	Interfaces/data import: Compatibility with existing systems, e.g. energy management software, Enterprise Resource Planning (ERP) systems
	Ability to map company structure, e.g. different sites, departments, processes
	Role and rights management: Important for data entry: Can different rights be assigned to the relevant responsible persons within the company?
	Result visualisation: Is visual presentation of results in the corporate design possible?
Other	Data protection guidelines are adhered to
	User-friendliness and intuitive operation
	Termination rights
	Support from customer service or technical support

The procedure for data collection and calculation for each individual scope is outlined below. As emission factors are required for the calculation of all scopes, the data sources for these are described below.

Practical tip: Finding tools and software for accounting

The EMAS software database offers various resources to assist in selecting a suitable software solution for greenhouse gas emissions accounting. The requirements for the software can be determined using the **checklist** provided. Furthermore, **searching the database** provides an overview of available software providers and their solutions.

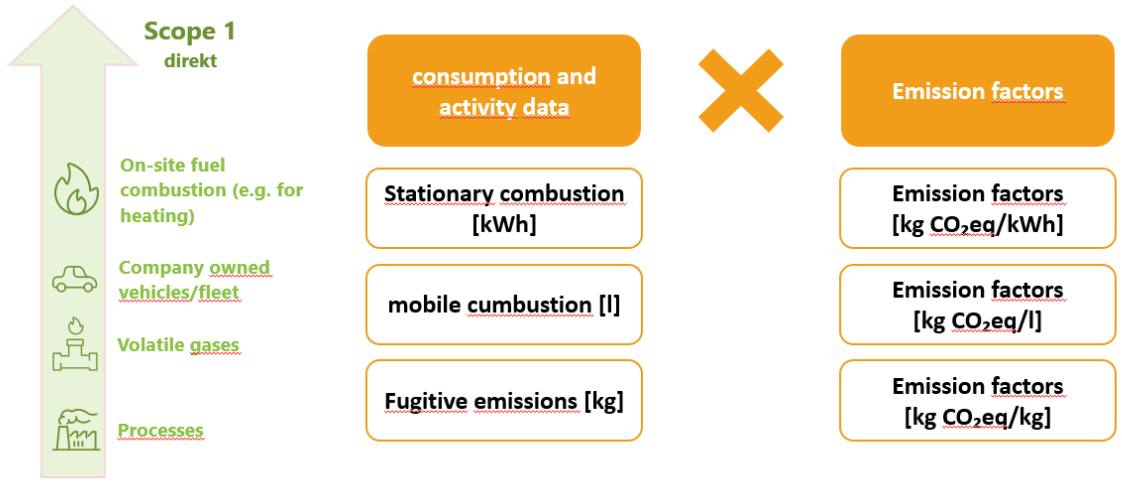
4.2.1 Scope 1

Scope 1 emissions are direct GHG emissions from sources owned or controlled by a company. They arise, for example, from:

- The combustion of fossil fuels such as natural gas, oil and coal, e.g. in boilers or furnaces for the generation of space and process heat
- Vehicle fleets (e.g. diesel, petrol)
- Emissions from technical, physical or chemical processes (e.g. in the production of lime)
- Volatile gases (e.g. refrigerant leaks in air conditioning systems)

The first step is to select a **calculation method for determining these emissions**. Emissions can be recorded either through **direct measurements** (e.g. measurements required under the Federal Immission Control Act (BImSchV)), by **derivation via mass balance or stoichiometry**, or by **taking** data from available sources such as invoices or supply contracts. If direct measurements cannot be carried out, assumptions are often made to determine the emissions. Figure 6 shows which activity data from the company are multiplied by appropriate emission factors to determine Scope 1 emissions.

Figure 6 : Calculation of Scope 1 emissions



Source: Own illustration based on GHG Protocol: A Corporate Accounting and Reporting Standard

Practical tip: Heating value or calorific value of fuels? Which conversion factors can I use?

In practice, accounting is often complicated by details:

- Case 1: Whilst invoices from fuel suppliers usually state the **calorific value** of the energy source, emission factors are generally **based on the heating value**. Therefore, conversion to the heating value is required before multiplying by the emission factor.
- Case 2: Fuel consumption figures are given in a different unit (e.g. litres or m^3) and must first be converted to kWh.
- The conversion factors for common energy sources are published by the UBA and can be found here.

Practical note: Coolants in accounting

The GHG potential of refrigerants can be found, for example, here. The amount of refrigerant released into the air in a year can be determined from the quantities of refrigerant topped up. This information is usually available from the **maintenance log of the refrigeration systems**. Important: Only the amount of refrigerant topped up in the year being accounted for is relevant. If top-ups are carried out at intervals of more than one year, the amount is distributed across all years.

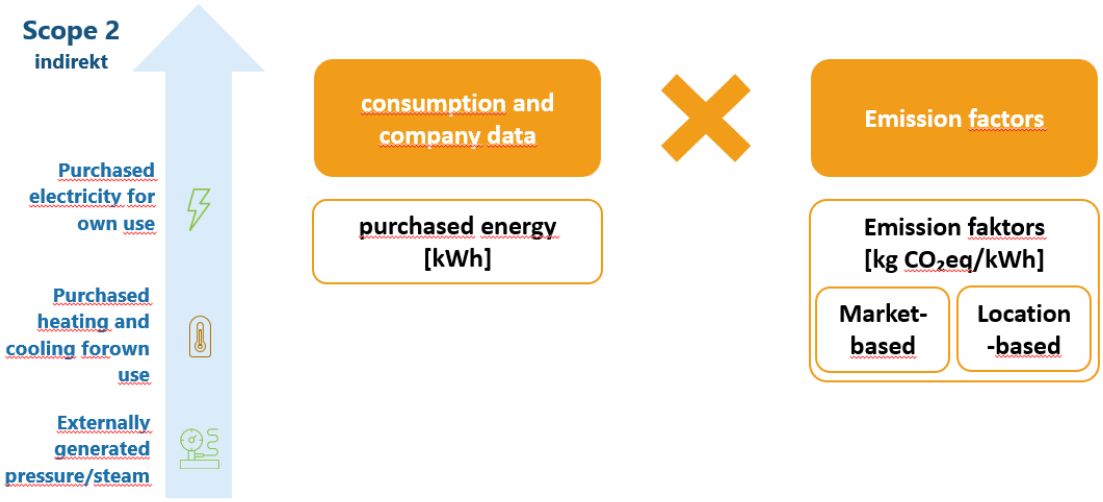
4.2.2 Scope 2

Scope 2 accounts for operational emissions resulting from the consumption of purchased energy. These include emissions from the purchase of:

- electricity
- (District) heating and cooling
- Externally generated compressed air (in practice, particularly relevant in larger industrial estates)
- Externally generated steam (in practice, this is particularly relevant in larger industrial estates)

For Scope 2, as shown in Figure 7 , the purchased quantity of energy is multiplied by the respective emission factors.

Figure 7 : Calculation of Scope 2 emissions



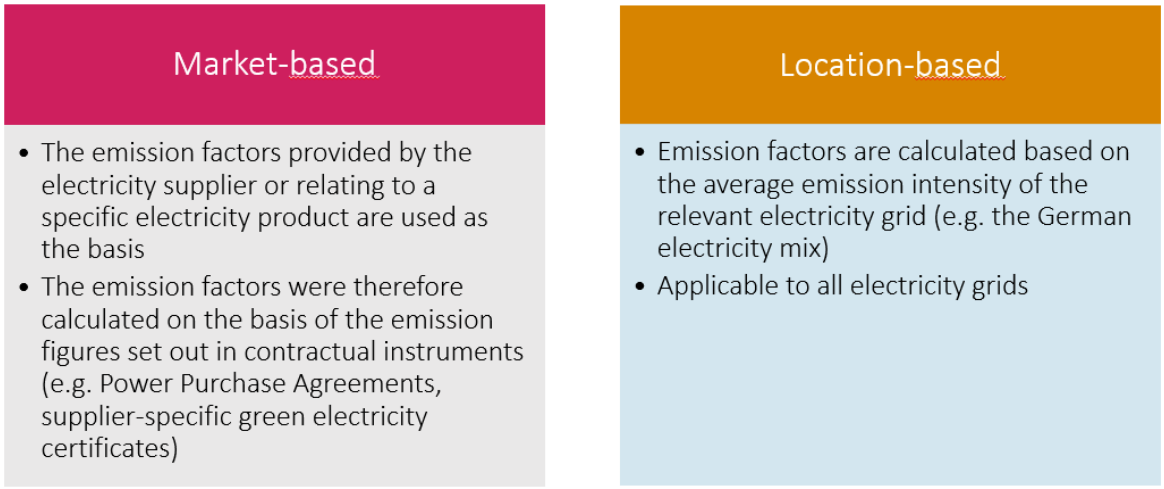
Source: Own illustration based on GHG Protocol: A Corporate Accounting and Reporting Standard

Two different calculation approaches are used when purchasing electricity (see Figure 8). In the market-based approach, the emission factors are based on the information provided by the electricity supplier. If a company purchases green electricity, for example, an emission factor of 0 kg CO_2-eq./kWh is assumed. However, the demand for green electricity in itself has no impact on the share of renewable energy in the electricity mix – this is determined by the Renewable Energy Sources Act and emissions trading. In the **location-based** approach, the emission factor is based on the emission intensity of the respective electricity grid, i.e. the electricity it physically procures. For a company location in Germany, therefore, the emission factors of the German electricity mix apply, as published by the Federal Environment Agency (Icha et al. (2025)).

Market-based emission factors therefore refer to the emissions associated with specific supply contracts. Location-based emission factors, on the other hand, reflect the average emissions of the electricity mix at the location, i.e. what is physically drawn from the grid.

Important: When emissions are reported using the market-based approach, the GHG Protocol requires that emissions must always also be presented using the location-based approach. ISO 14064-1 mandates accounting based on location-based emission factors and permits only supplementary reporting using the market-based approach.

Figure 8 : Market-based vs. site-based emission factors for the electricity mix in Scope 2



Source: Own illustration based on the GHG Protocol: A Corporate Accounting and Reporting Standard

4.2.3 Scope 3

Scope 3 emissions include all other indirect emissions from the upstream and downstream value chain. The GHG Protocol distinguishes between 15 different Scope 3 categories, which are shown in Figure 4at REF _Ref205759803 \h. Not every company is required to fully report emissions for all 15 categories in Scope 3. This is because the first step involves determining which emission categories within Scope 3 are material.

Identifying significant Scope 3 categories

First, an overview of the company's value chain is created. This involves compiling a list that sets out all Scope 3 categories alongside the company's respective activities, as well as the products bought and sold and the relevant suppliers or partners. On this basis, individual categories can be excluded at an early stage if no emissions arise there (e.g. if the company does not operate a franchise or if no emissions occur during the use of the product).

If emissions do occur but are of minor significance, they may be excluded. They should be selected and assessed on a reasoned basis. Table 5 shows possible criteria for determining relevant categories.

For the assessment, information must therefore be available on the significance of individual categories within the context of climate management. This can be done via an estimate or rough calculation, or using industry benchmarks, such as those published by the CDP.

Table 5 : Criteria for the materiality analysis to determine relevant Scope 3 categories

Criterion	Description
Level of GHG emissions	Proportion of the emissions source in the overall balance.
Opportunities for influence/controllability	The company's ability to reduce or influence emissions.
Risk from a corporate perspective	Analysis of business risks and opportunities, e.g. in relation to finance, compliance, supply chain, reputation.
Relevance from a stakeholder perspective	The category is relevant to specific stakeholders (e.g. customers, suppliers, investors, etc.).
Outsourcing	Emissions from activities that were previously carried out within the company itself and have now been outsourced must be included in Scope 3.
Industry-specific recommendations	Relevant Scope 3 categories for the company's sector.

Source: Own representation based on GHG Protocol (2013) Scope 3 Guidance Table 6.1

Calculation of Scope 3

Once the significant Scope 3 categories have been identified, a calculation methodology is determined for each category. The calculation methods differ across categories and influence the accuracy of the calculation. For Scope 3.1 'Purchased Goods and Services', the possible calculation methods are set out in Table 6 .

Table 6 : Calculation methods for Scope 3.1 'Purchased goods and services' with an assessment of accuracy

Method	Description	Accuracy/Precision
Manufacturer/supplier-based	GHG inventory data is collected at product and material level from the cradle to the destination by suppliers of goods or services.	Very high accuracy, particularly if the data has already been verified by other systems, such as certified product carbon footprints in accordance with ISO 14067:2018 or comparable standards.
Hybrid method	Combination of specific activity data from suppliers (where available) and secondary data from the literature to fill any data gaps.	See "Manufacturer/supplier-based" and "Average method"
Average method	Emissions estimation based on mass or other relevant units (e.g. from ERP systems) multiplied by a secondary emission factor (e.g. average emissions per unit mass of the good).	Moderate accuracy; data sources should be checked for completeness and plausibility.
Expenditure-based method	Emissions estimation based on the economic value multiplied by secondary emission factors (e.g. average emissions per monetary value of the good).	Relatively low accuracy, as price fluctuations significantly influence the result.

More than one calculation method may be selected per category. The **choice of calculation approach** is based, among other things, on the **availability of data within the organisation**; however, the **significance of the emission sources** should also be taken into account in data collection. For example, expenditure-based data is often available for purchased goods and services.

When calculating using this approach, it becomes clear which materials / goods / services cause particularly high emissions. A more precise calculation method can then be selected for these.

The choice of calculation method also influences the source of the data and which individuals need to be involved in data collection. Table 7 to Table 9 show, for three example categories, the data required within the company and possible contact persons or data sources depending on the data collection method.

Table 7 : Possible contact persons or data sources for various data collection methods in Scope 3.1 – Purchased goods and services

Data collection method	Data from the company	Possible contact persons/data sources
Supplier-specific	Suppliers' emissions data regarding their Scope 1 & 2 emissions or the entire upstream supply chain	Suppliers
Average data	Mass (or other relevant units) of the goods or services purchased	Purchasing, financial accounting, product development
Expenditure-based	Amounts spent on purchased goods and services by product group, taking market value into account	Purchasing, Controlling

Table 8 : Possible contacts or data sources for various data collection methods in 3.4 – Transport and distribution

Data collection method	Data from the reporting company	Possible contact persons/data sources
Fuel-based	Quantity of fuel consumed by transport service providers	Fuel receipts; purchase receipts (from transport companies)
Distance-based	Mass or volume of products transported	Purchase receipts, management system, online maps for distance
Expenditure-based	Length of transport routes	Invoices, purchasing, controlling by the external logistics provider

Table 9 : Possible contact persons or data sources for various data collection methods in 3.11 – Use of sold products

Type of emissions during the use phase	Data from the reporting company	Possible contact persons/data sources
Emissions from products that directly consume energy (fuels/electricity) during use (e.g. cars, engines, plant, electrical appliances).	Quantity of products sold Assumptions regarding the use phase (e.g. car fuel consumption, total service life, usage behaviour, etc.)	Estimates, product development, sales, industry associations
Emissions from products such as fuels and raw materials	Quantity of products sold and expected combustion	Sales, purchasing
Products that contain or generate greenhouse gases which are emitted during use (e.g. coolant losses).	Quantity of products sold and assumptions regarding GHG emissions arising from use	Product development
Products that indirectly consume energy (fuels or electricity) during use (e.g. clothing, pots, etc.)	Quantity of products sold and assumptions regarding energy consumption, service life and usage behaviour	Product development, estimates, benchmarks, studies

4.2.4 Emission factors

Emission factors are required for all three scopes to calculate the GHG balance. These should meet the following quality criteria:

- **Specific:** The emission factor should be specific to the respective energy source / material / mode of transport / waste disposal method, etc.
- **Regionally appropriate:** Emission factors vary depending on where the materials are produced. If the origin of the materials is known, this should be taken into account in the emission factor.
- **Up-to-date:** The emission factors should be as up-to-date as possible. This applies in particular to processes with rapidly changing conditions, e.g. electricity generation.
- **Reliability:** Emission factors should be taken from credible and transparently documented sources.
- **Completeness:** Taking into account all greenhouse gases (not just CO_2) and the appropriate system boundary for each category. For example, in Scope 3.6 (business travel), Scope 1 and 2 emissions from the use of transport for business travel are included. Optionally, life-cycle emissions for the manufacture of vehicles and infrastructure may also be included in the calculation.

Further information on the system boundaries for the individual categories can be found in the Technical Guidance for Calculating Scope 3 Emissions; Table 1.

Companies can obtain **generic emission factors** from databases. An important data source is the emission factors for GHG accounting by organisations provided by the German Federal Environment Agency. The list contains up-to-date and quality-assured emission factors and is regularly updated. Other data sources may also be used. The choice of data source depends on many criteria, such as cost, timeliness and the number of data records. Table 10 provides an overview of available data sources for emission factors.

Table 10 : Data sources for emission factors

Database	Publisher	Subject to a fee	Up-to-date	Data sets	Comments
Emission factors for GHG accounting	UBA	No	Updated regularly		First published in autumn 2025; updated in December.
IPCC – AR6	IPCC	No	Updated regularly		Global Warming Potential of individual greenhouse gases in kg CO_2 eq.
Ecoinvent	Ecoinvent Assoc.	Yes	Updated annually	20,000	
Managed LCA Content (formerly GaBi)	sphera	Yes	Updated annually	15,000	
cm.chemicals	Carbon minds	Yes	Updated regularly	30,000	

Database	Publisher	Subject to a fee	Up-to-date	Data sets	Comments
GEMIS	IINAS	No	Partially out of date	10,000	
Information sheet CO_2 factors	BAFA	No	Updated regularly	300	Included in the UBA list of emission factors
ÖKOBAUDAT	BMWSB	No	Updated regularly	1 100	
DEFRA GHG Reporting Factors	UK Government	No	Updated regularly	500	Partly UK-specific data
Scope 3 Analyzer	INEC, Systain Consulting, THINKTANK Industrial Resource Strategies	No	Updated regularly	Unknown	

4.2.5 Accounting for other climate impacts

In addition to the climate impacts caused by GHG emissions already described, companies may also cause other climate impacts. Examples include effects resulting from land-use change, GHG removals, or non-CO_2 emissions from aviation. Some of these other climate impacts are briefly described here.

In addition to its GHG emissions, the organisation should also account for its **GHG removals** at its sites and within its value chain. If a company offsets its emissions in whole or in part through removals within its own operations or in its upstream or downstream value chain, this is also referred to as 'insetting'. By contrast, 'offsetting' or compensation involves offsetting GHG emissions outside its value chain, e.g. by purchasing CO_2 certificates on the voluntary market (carbon credits) (see chapter 7.5). Examples of GHG removals include CO_2 sequestration through afforestation, carbon storage in the soil (e.g. through humus-building agriculture), Carbon Capture and Storage (CCS), and technical processes such as direct CO_2 capture from the air (Direct Air Capture, DAC). The precise accounting is explained in the GHG Protocol (2026) Land Sector and Removals Guidance.

In addition to direct CO_2 emissions, **aviation** generates **further climate-impacting effects** that do not fall under the IPCC's definition of greenhouse gases. These include the emission of water vapour (e.g. contrails), nitrogen oxides, soot particles and other aerosols, which at high altitudes contribute to the formation of cirrus clouds and to the intensification of the greenhouse effect (Allekotte et al. (2024)). Although these effects are not considered classic greenhouse gases, it is standard scientific practice to convert their climate impact into CO_2 equivalents based on their Global Warming Potential (GWP). This approach is recommended, among others, by the German Federal Environment Agency (Allekotte et al. (2024)) to present the overall impacts of air traffic in a comparable manner.

4.2.6 Biogenic CO_2

According to the GHG Protocol, direct CO_2 emissions from the combustion of biomass must be reported separately. Furthermore, the carbon sequestration of bio-based products is also reported separately outside the scopes. ISO 14064-1:2018 stipulates that biogenic CO_2 emissions and their removals must be quantified and reported separately from other emissions. The

following applies to biogenic emissions and removals of other greenhouse gases (e.g. CH_4 and N_2O): these must also be recorded and reported accordingly.

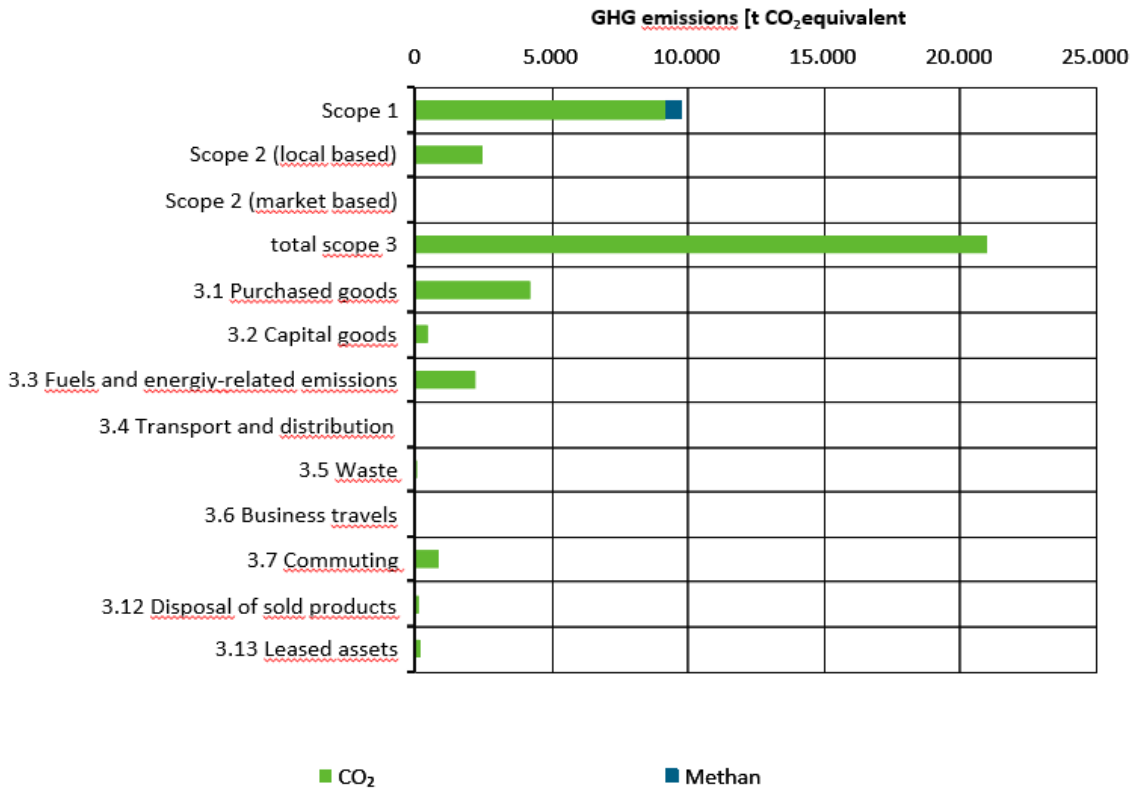
4.3 Presentation of the greenhouse gas inventory

The following example (see Figure 9) shows a presentation of total GHG emissions. The following guidelines were followed for this.

Practical note: Checklist for presenting GHG emissions

- Have the GHG emissions been correctly allocated to the scopes?
- If possible: Breakdown of emissions by site, plant, process and business division
- Breakdown of GHG emissions by Kyoto gases and in tonnes of CO_2 equivalent
- Report Scope 2 emissions using market-based and site-based calculations
- Calculation of all material Scope 3 categories

Figure 9 : Example of a greenhouse gas inventory



Source: Own illustration

4.4 Regular updates

Scope 1 and 2 emissions should be updated annually, and Scope 3 emissions at least every three years. Significant changes in Scope 3 emissions should be reflected in the GHG inventory without delay. The following points play an important role in the update:

- Consistency in organisational boundaries (see chapter 3.1): The same organisational framework and the same approaches (operational control vs. equity share) should be applied.

- If the organisational boundaries change, this must be clearly documented.
- Updated emission factors (for example, for the electricity mix) should be used.
- Particularly for Scope 3, data quality can be significantly improved over time. If, for example, only expenditure-based emissions are available in one year, data collection can be improved the following year to also calculate emissions on a volume basis.
- To interpret the results, clear documentation of the changes is necessary. For example, a change of electricity supplier, the calculation of a new Scope 3 category, the acquisition of new subsidiaries, the closure of sites, a change in the calculation methodology, or the implementation of measures affecting emissions should be documented.
- It is important to distinguish the influence of changed accounting methods – for example, due to improved activity data or more accurate emission factors – from other influencing factors. Otherwise, trends in GHG emissions may lead to incorrect conclusions, for instance regarding the effectiveness of measures or the appropriateness of targets.

5 Identifying risks and opportunities – Assessment of physical climate risks, transition risks and opportunities

Identifying risks and opportunities: How do I use this chapter?

- This chapter provides an introduction to the topic of climate-related risks.
- It highlights the importance of climate risk analysis for environmental management systems and regulatory frameworks such as the EU Taxonomy, the CSRD and the Voluntary Sustainability Reporting Standard for SMEs (VSME).
- An overview of the basic approach to a climate risk analysis is provided.
- For further in-depth study of the topic, reference is made to relevant sources.

Underlying elements in the requirements catalogue (see Annex A.3)

- Climate risks and opportunities (transition risks and opportunities, physical climate risks) (see requirement 3.2)
- Binding commitments (see requirement 3.3)

5.1 Integration of climate-related risks into the management system

As part of a climate risk analysis, an organisation's climate-related risks and opportunities are identified and assessed for their relevance. These climate-related risks and opportunities are usually divided into physical climate risks and transition risks and opportunities, as recommended by the Task Force on Climate-related Financial Disclosures (TCFD){xe "Task Force in Climate-related Financial Disclosures" \t "Task Force in Climate-related Financial Disclosures"}. Physical risks arise from the direct consequences of climate change, such as extreme weather events or long-term climate changes, whilst transition risks result from the transition to a low-carbon economy, for example through new regulations, technologies or market changes. (Task Force on Climate-related Financial Disclosures (2017))

In principle, the magnitude of a risk is determined by the probability of a hazard occurring and the extent of the damage (Federal Office for Information Security (2008)). Applied to climate-related risks, this means that, starting from a climate-related hazard (e.g. drought), the first step is to determine to what extent and with what probability the system at risk (e.g. a power station) is affected (e.g. a shortage of cooling water). The climate-related risk (e.g. reduction in electricity generation) can then be assessed based on the sensitivity of the vulnerable system (e.g. the need for cooling water for electricity generation).

As outlined in ((2024) and ((2022), the management of climate-related risks can, in principle, be integrated into environmental management systems in accordance with ISO 14001 and EMAS. This is explained in the white paper on the application of ISO 14090 (Adaptation to Climate Change) for ISO 14001:2015. However, as environmental management systems do not contain specific requirements regarding the handling of climate-related risks, their consideration depends heavily on actual practice. Top management plays a particular role in this regard, as it significantly shapes the fundamental orientation of the environmental management system (Glatzner and Leow (2022)) (see chapter 2). Systematic climate risk management is not guaranteed within the framework of existing environmental management systems. ISO 14002-3 is intended to provide further guidance on this and support the integration of climate-related aspects.

Due to current regulatory developments, in particular the requirements of the CSRD, the EU Taxonomy, and the EU's voluntary VSME standard, climate risk analysis is becoming increasingly important for companies. For instance, under the Delegated Act on the EU Taxonomy, a climate risk and vulnerability assessment is mandatory to demonstrate the substantial contribution of an economic activity to the objective of climate adaptation. Within the framework of the CSRD, too, climate risk analysis forms a central basis for identifying and disclosing the interactions between material climate risks, corporate strategy and the business model (ESRS E1). Furthermore, it supports the planning of relevant climate mitigation and adaptation measures, as well as the financial assessment of the associated risks. Adherence to the recommendations of the TCFD provides an established international reference framework (Task Force on Climate-related Financial Disclosures (TCFD) (2017)). Furthermore, public climate risk analyses, such as the German Climate Impact and Risk Analysis (Kahlenborn et al. (2021)) or the European Climate Risk Assessment (European Energy Agency (EEA) (2024)), can be utilised. Ideally, local and regional climate risk analyses can even be drawn upon (cf. Federal Republic of Germany (2023). Federal Climate Adaptation Act (KAnG), Section 10 Climate Adaptation by the Federal States and Section 12 Climate Adaptation Concepts). The voluntary reporting standard for small and medium-sized enterprises (VSME) does not provide for a comprehensive climate risk analysis, but requires, in accordance with disclosure item C4 of the advanced module, a description of climate-related hazards and transition events, provided these have been identified, and whether adaptation measures have been taken.

5.2 Conducting the climate risk analysis

In accordance with the UBA guidelines on climate risk and vulnerability assessment in the context of the EU taxonomy (Dorsch et al. (2022)), which take into account the principles of EN ISO 14091:2021 and the IPCC's Sixth Assessment Report, the procedure can be broken down into the following four key steps.[8]

5.2.1 Physical risks

1. Determining the lifespan of economic activity and breaking it down into units of analysis

For each economic activity, the lifespan is first determined in order to define the relevant time period. According to the EU taxonomy, the lifespan is particularly relevant in that certain methodological requirements, such as the use of scenarios, are only necessary for activities with a lifespan of more than 10 years. Furthermore, the economic activity is broken down into specific study objects. These may include, for example, production sites, but also suppliers and transport between locations.

2. Screening to identify climate-related hazards

Once the relevant objects of investigation have been identified, the next step involves a screening process to select the climate-related hazards (see Table 11) that may affect the economic activity over its lifespan (see Step 1). This screening step acts as a filter, as only the relevant climate hazards are included in the actual assessment in the third step. As some climate-related hazards are site-specific, they can be excluded, for example, on the basis of their spatial occurrence. A further exclusion criterion is the probability of significant damage. To this end, the objects under investigation (e.g. production site) are broken down into system elements (e.g. buildings, power supply, employees). These system elements are then compared with the climate-

[8] Whilst the EU Taxonomy focuses primarily on physical climate risks (i.e. risks arising from climatic changes such as heat, flooding or drought), the chapter '5.2.2 ' of the guidelines also mentions transition risks.

related hazards, for example in a matrix. On this basis, an assessment is made of the extent to which the respective climate-related hazard could lead to significant negative impacts on the respective system element.

Table 11 : Classification of physical climate risks

Type	Chronic	Acute
Temperature	• Temperature change (air, fresh water, sea water) • Heat stress • Temperature variability • Thawing of permafrost	• Heatwave • Cold snap, frost • Forest and wildfires
Wind	• Change in wind conditions	• Cyclone, hurricane, typhoon, • Storm (including snow, dust and sandstorms) • Tornado
Water	• Variability in precipitation or hydrology • Ocean acidification • Saltwater intrusion • Rising sea levels • Water scarcity	• Drought • Heavy precipitation (rain, hail, snow/ice) • Flooding (coastal, river, pluvial, groundwater) • Overflowing glacial lakes
Solid matter	• Coastal erosion, soil degradation, • soil erosion, • solifluction	• Avalanche • Landslide • Land subsidence

Source: EFRAG (2025)

3. Conducting the climate risk assessment

The materiality of the physical climate risks is then assessed for all system elements of the subject under investigation. The climate risks arise from the climate-related hazards that may have a significant adverse impact on the system elements (see previous step). To assess materiality, an understanding of the relationships between climate-related hazards and the system elements is first required. For this purpose, one can, for example, utilise the visualisation of causal relationships using climate impact chains. In the next step, information on current and future climate-related hazards is gathered. This data is provided, for example, by national meteorological services (information on climate parameters, based on both trends and climate scenarios) as well as through climate scenarios (derivation of long-term developments). In addition, local and regional climate risk analyses, such as the German Climate Impact and Risk Analysis (Kahlenborn et al. (2021)), can be used. Furthermore, information on the sensitivity of the potentially affected system elements must be collected. For this purpose, past experience and empirical values from comparable case studies can be drawn upon. For the final assessment of physical climate risks, the system elements are compared with the climate-related hazards in a climate risk matrix (see schematic representation at Table 12).

4. Identification and assessment of adaptation measures

Finally, in the last step, adaptation measures are identified for the significant risks identified and assessed in terms of their potential to reduce the risks. This is based on an examination of the organisation's current and future adaptation capacity (e.g. financial resources, available staff), so that suitable adaptation measures can be identified and consolidated into an adaptation plan.

5.2.2 Integration of transition risks

Whilst the EU taxonomy focuses on physical climate risks, the basic approach can also be applied to transition risks and opportunities: once the system boundary has been defined and the objects of analysis identified, the next step is to identify climate-related transition events (see Table 13) that are relevant to the organisation in question. These are then assessed in terms of their impact on the organisation, taking into account both the probability of occurrence and the extent of damage. Based on this, measures to mitigate the risks or capitalise on the opportunities can finally be identified and evaluated.

Table 12 : Examples of climate-related transition events

Policy and law	Technology	Market	Reputation
Higher pricing of greenhouse gas emissions	Replacement of existing products and services with lower-emission options	Change in consumer behaviour	Change in consumer preferences
Stricter emissions reporting requirements	Unsuccessful investments in new technologies	Uncertainty regarding market signals	Stigmatisation of the sector
Mandates and regulation relating to existing products and services	Costs of the transition to lower-emission technologies	Rising raw material costs	Growing concern among stakeholders
Mandates and regulation relating to existing production processes			Negative feedback from stakeholders
Risk of warnings, lawsuits and other legal disputes			

Note: Figure based on the TCFD classification
Source: European Union (2023)

Table 13 : Illustrative assessment of physical climate risks for a (fictitious) industrial site

System elements (industrial site)	Heatwave/ Heat stress			Storm (including snow-storms, dust and sand-storms)			Flooding – river			etc. …		
	Current risk	RCP8.5 Optimis-tic	RCP8.5 Pessimis-tic	Current risk	RCP8.5 Optimistic	RCP8.5 Pessimis-tic	Current risk	RCP8.5 Optimistic	RCP8.5 Pessimis-tic	Current risk	RCP8.5 Optimis-tic	RCP8.5 Pessimis-tic
Buildings in general												
Building construction												
Basements												
Indoor operational fa-cilities												
Outdoor operational facilities												
Indoor warehouses												
Outdoor warehouses												
Access to the site, site traffic (cars, lorries, rail, ship)												
Regional accessibility (cars, lorries, rail, ship)												
Water supply												
Electricity supply												
Other utility connec-tions												
Production process												
Staff												

Key	Low risk	Medium risk	High risk

Source: Table slightly modified from Dorsch et al., 2022, p. 26

Good practice example: MPG Mendener Präzisionsrohr GmbH (EMAS Climate Management Module experience report)

As an energy-intensive company operating in an international competitive environment, MPG Mendener Präzisionsrohr GmbH has been pursuing a systematic climate protection strategy since 2005 and has reduced its carbon footprint (Scope 1–3) by around 50% since then. A complete GHG inventory is available for the years from 2017 onwards. Binding targets were defined in 2020: GHG neutrality for Scope 1 and 2 at the Menden site by 2030 at the latest, a reduction in Scope 3 emissions of at least 75% compared to 2017, and the establishment of closed material cycles and measures to promote biodiversity on the company premises. Offsetting and the purchase of carbon credits are not currently part of the strategy.

As part of the EMAS Climate Management Module, the climate strategy was further developed through a comprehensive risk analysis, which examined the impacts of climate change, distinguishing between physical and transitional risks. The physical risks were systematically assessed along the value chain based on a 2 °C scenario, with particular consideration given to potential impacts from extreme weather events, increasing heat stress and changing climatic conditions. This led to specific measures for flood protection (flood-proof construction of the foundry's cooling system, embankment construction) as well as heat protection for employees through a reduction in direct sunlight.

In parallel, the transition risks arising from political, regulatory and market-related changes in the course of the transition to a climate-neutral economy were examined. These include, among other things, the loss of revenue potential (condenser tubes for steam power plants, equipment for the oil and gas industry), progressive CO_2 pricing, a rise in raw material prices, and growing expectations from customers, investors and other stakeholders. On the one hand, the product portfolio and new target markets (including industrial heat pumps) have been expanded. On the other hand, organisational and infrastructural measures have been formulated that not only ensure compliance with future regulations but also strengthen the company's competitiveness. These include, amongst other things, a take-back programme to close material cycles for the metals used.

This demonstrates that MPG not only aligns its climate strategy with mitigation targets, but also builds on these through the forward-looking assessment of opportunities and risks to create a resilient and sustainable climate management system.

Table 14 : Risk analysis at MPG Mendener Präzisionsrohr GmbH

Risk type			acute		Chronic	
Type of risk			Heatwave	Flooding (coasts, rivers, rain, groundwater)	Heat stress	Water scarcity
Risk/Impact				Flooding of production facilities		
System elements at risk	Upstream supply chains	Extent	1			
		Probability of occurrence	3			
	Organisation	Scope	2	3	2	2
		Probability of occurrence	3	3	3	2
	Downstream supply chains	Scope				
		Probability of occurrence				
Adaptation measures			Skylights block out light Ceiling spotlights provide cooling via heat pumps	Installation of a new cooling system for the foundry, construction of embankments, relocation of the IT system		Increased use of air coolers, heat pumps for pre-cooling before evaporation cycles

6 Set targets – Establish ambitious and verifiable climate targets

Setting targets: How do I use this chapter?

- This chapter describes how companies can develop and structure effective greenhouse gas reduction targets.
- It highlights how targets relating to climate risks and climate adaptation can be formulated.
- It explains the role of base and target years, different types of targets and methodological approaches.
- In addition, it demonstrates how non-emissions-related targets can contribute to the integration of climate aspects into business processes.

Underlying elements in the requirements catalogue (see Annex A.3)

- Climate protection targets (GHG emission reduction targets, non-emission-related climate protection targets) (see requirement 4.1)
- Targets for addressing climate risks and opportunities (see requirement 4.2)
- Key figures (see requirement 4.3)

The greenhouse gas inventory (Chapter 4) and an understanding of climate risks and opportunities (Chapter 5) form the basis of systematic climate management. In order to manage climate aspects effectively, a set of targets is required that provides a binding and long-term framework for action. Climate targets define the intended decarbonisation pathway and serve to guide the operational and strategic management of corporate transformation processes within climate management. In addition to reducing GHG emissions, companies should also formulate targets for managing climate risks and adapting to climate impacts in order to strengthen their resilience to the effects of climate change.

Climate targets should be consistent with senior management's commitment to climate protection and adaptation (see chapter 2.1.1) as well as the company's transformation plan (see chapter 2.1.5).

This section explains how climate targets can be derived based on a company's emissions profile and taking into account science-based standards – such as those set out by Science Based Targets – and how these can be supplemented with objectives relating to climate risks and adaptation measures. Setting these targets marks a significant milestone in the development of a consistent and manageable climate management framework.

The S.M.A.R.T. method should be used to assist in setting climate targets (see Table 15).

Table 15 : Defining S.M.A.R.T. climate targets

Criterion	Description	Example GHG reduction target/climate adaptation target
Specific	Targets should be clearly defined and described as precisely as possible in terms of content and scope	Reduction of Scope 1 GHG emissions/ Reduction of climate-related downtime costs resulting from power outages
Measurable	Targets should be measurable against specific criteria to enable performance monitoring	by 65% or by 2,000 tonnes $_{of\ CO_2}$equivalent compared to the base year 2020/ by 70% or by €21,000 per year
Ambitious	Targets should be motivating to work towards	in line with the national Climate Protection Act compared to the current €30,000 per year
Realistic	Targets should be achievable with available resources	Appropriate sector-specific measures for climate protection (e.g. electrification) and climate adaptation (e.g. emergency power supply) exist
Time-bound	Targets should include clear deadlines	by 2035

6.1 Targets for reducing greenhouse gas emissions

Effective climate management is based on setting verifiable greenhouse gas reduction targets covering short-, medium- and long-term timeframes. These should encompass direct emissions (Scope 1), indirect emissions from purchased energy (Scope 2) and significant emissions along the upstream and downstream value chain (Scope 3). The targets can be defined separately for each scope or in aggregated form – the key factor is the traceability of the underlying data and assumptions. The scope of the targets should align with the GHG accounting and the organisational scope of the climate management system.

Particularly for long-term objectives – such as GHG neutrality or net-zero emissions – it is advisable to develop a pathway to achieving the targets that maps out the planned emissions trajectory over the years. Short- and medium-term reduction targets serve as concrete milestones along this pathway.

Practical note: non-eligible measures

The purchase of carbon credits from voluntary climate protection projects must not be counted towards the achievement of GHG emission reduction or removal targets, nor included in the GHG inventories (Chapter 4.2.5). This does not preclude the company from setting supplementary targets to promote projects for generating carbon credits.

Determination of the base year:

The determination of a base year is a key prerequisite for making GHG reduction targets in corporate climate management measurable and traceable. The base year serves as a reference point for determining and evaluating future emissions trends. The choice of the base year should be transparently documented and **justified**, particularly with regard to external audits and reporting requirements (e.g. CSRD/ESRS E1).

The base year should relate to the organisational and operational boundaries of the organisation (see chapter 3) and represent current business activities. Years with exceptional operational influences – such as those resulting from particularly high capacity utilisation or structural upheavals – are unsuitable, as they would lead to distorted emission figures. To improve

representativeness, a multi-year average may alternatively be selected as the basis. Where possible, a uniform base year should be established for different scopes and target levels within the organisation to ensure the comparability of climate targets.

Another key criterion for selection is data **availability and quality**. Complete, traceable and methodologically consistent greenhouse gas data must be available for the selected year, based on recognised standards such as the GHG Protocol or ISO 14064-1:2018. Companies should check whether the relevant emission sources for all material activities and sites have been systematically recorded and whether the underlying methodology is documented.

When dealing with the base year, it must be ensured that structural or methodological changes – such as adjustments to reporting or organisational boundaries, changes in the calculation methodology or identified errors – are taken into account retrospectively. To ensure the comparability of emissions data over time, the GHG Protocol recommends **recalculation** based on clear criteria.

Setting the target year

Setting specific target years is crucial for structuring GHG reduction targets over time, making progress measurable, and embedding corporate climate targets within overarching political and scientific frameworks.

A distinction can be made between the following time horizons:

- **Short-term targets**: < 5 years
  Focus on immediate emission reduction measures
- **Medium-term targets**: approx. 5–10 years
  Address structural transformation processes within organisations and value chains
- **Long-term targets:** > 10 years
  Define the desired climate-related target position, such as net greenhouse gas neutrality or the achievement of GHG emissions deemed technically and economically impossible to reduce further.

When setting time horizons for climate targets, the organisation should align itself with its company-specific planning and investment cycles, as well as with the relevant European and national climate targets. The year 2045 or 2050 is a suitable long-term timeframe, as provided for in the Federal Climate Protection Act and in the European Union's climate neutrality targets. Short- and medium-term targets – e.g. for 2030 or 2035 – should be coherently aligned with this and enable a realistic reduction pathway towards the long-term target.

Types of reduction targets

When setting targets in climate management, a distinction is made between **absolute** and **relative** (intensity-based) emissions targets.

Absolute targets define a fixed reduction in GHG emissions compared to a base year – regardless of company growth.
→ Example: *"Reduction of total GHG emissions by 60% by 2035 compared to 2020*".

Relative climate targets, on the other hand, focus on intensity by relating emissions to a benchmark, such as production volume, turnover or the number of employees.
→ Example: *"Reducing emissions per manufactured product by 30% by 2030*".

This type of target makes it possible to highlight growth-related trends, but is of limited use for assessing a company's actual climate impact. Absolute reduction targets and the associated metrics should therefore be prioritised, as they contribute most directly to achieving global climate

targets. Relative targets can be useful as a complement in the context of absolute reduction pathways.

Approaches to developing reduction targets

When setting climate targets, a distinction is often made between top-down and **bottom-up targets**. These two approaches differ in terms of their derivation and objectives and can complement each other effectively.

Top-down targets are derived from scientific findings or climate policy objectives and are of a medium- to long-term nature. The focus here is on the necessary emissions reductions, e.g. to comply with the Paris Agreement. These targets set out a clear reduction pathway without taking into account the reduction potential within the company and, where applicable, before concrete measures to achieve the targets are planned. Their advantage lies in their consistency with scientific findings and their contribution to achieving collective climate targets; however, they can be challenging for companies to implement in practice. Various consultancy firms offer support in formulating S.M.A.R.T. targets. (see next practical tip).

Practical tip: Science Based Targets

The Science Based Targets initiative (SBTi) offers an established framework for science-based target setting in climate management. The initiative has developed a methodological calculation approach to formulate GHG reduction targets in a way that is consistent with the goals of the Paris Agreement. The process consists of five steps:

1. Commit – Submit a letter of intent for Science Based Targets
2. Develop – Formulate company-specific reduction targets in accordance with the SBTi
3. Submit – Validation of targets by SBTi
4. Communicate – Share targets with stakeholders
5. Disclose – Annual reporting on target achievement

The SBTi Net-Zero Standard covers Scope 1, Scope 2 and Scope 3 emissions across the entire value chain. It distinguishes between near-term targets (5–10 years) and long-term targets. Near-term targets must align with the 1.5 °C target for Scope 1 and 2, and with at least 'well below 2 °C' for Scope 3. Long-term targets require emissions to be reduced to a residual level compatible with 1.5 °C scenarios by 2050 at the latest. Science Based Targets Initiative

Note: The SBTi's Net Zero Standard is currently being revised and is due to be officially published in 2026 and applied by companies from 2027 onwards.

Bottom-up targets, on the other hand, are developed from a company's internal perspective. Potential savings are identified based on the company's GHG inventory and its technical and organisational capabilities. Bottom-up targets are usually designed for a short- to medium-term timeframe and are more closely aligned with internal resources and implementation realities.

As part of an integrated climate management approach, it is advisable to combine both approaches: top-down targets set the overarching direction and level of ambition, whilst bottom-up analyses serve to operationalise achievable targets.

Areas of action

To achieve an overarching GHG reduction target, it makes sense to further break down the reduction target into areas of action or emission sources relevant to the organisation. This not only increases the manageability and transparency of target tracking but also enables effective embedding within the respective business units.

Typical areas of action from which specific reduction targets can be derived include, amongst others:

- **Procurement and raw materials**
- **Energy supply and consumption**
- **Products (goods and services)** (e.g. life-cycle emissions)
- **Mobility and transport** (business travel, vehicle fleet, commuter traffic, logistics processes)
- **Circular economy** (resource use, waste)

The organisation may – in addition to the overall reduction target – define a separate target for each relevant area of action. Whether these targets are communicated only internally or also externally is not decisive (see chapter 8).

6.2 Climate targets not related to greenhouse gas emissions

In addition to direct greenhouse gas reduction targets, it can be helpful for organisations to set **non-emissions-related targets**. These make it easier to integrate climate considerations into operational processes by translating an organisation's overarching climate goal into specific targets tailored to particular areas of action and stakeholders. This serves primarily to embed climate protection as an integral part of day-to-day operations across the various business units, to translate GHG reduction targets into tangible, industry- and company-specific metrics, and to leverage synergies with other sustainability targets.

Typical non-emission-related climate targets in the energy sector include, among other things, the reduction of final energy consumption, the improvement of energy efficiency, and the provision and supply of renewable energy. Targets for the substitution of climate-impacting substances (e.g. F-gases in refrigeration systems), procurement (e.g. recyclable or low-carbon products), the electrification of the vehicle fleet, or employee behaviour also fall into this category. It is crucial that these targets contribute to greenhouse gas reductions or the mitigation of climate risks, or create the conditions for climate neutrality.

In addition, qualitative targets can also be set to improve climate management itself. One example would be improving the data basis: by 2026, the quantities purchased and emission factors for at least 80% of the most important suppliers will be recorded in the ERP system and updated annually to improve the Scope 3 data basis.

6.3 Targets for addressing climate risks and opportunities

Furthermore, organisations should develop targets for managing **climate risks and opportunities**. Whilst mitigation targets are now established in many organisations, concrete targets for adapting to climate change are significantly less common. There is overlap between the two types of targets, for example when energy efficiency measures or the expansion of renewable energies simultaneously reduce GHG emissions and transition risks. Conflicts of interest may also arise with regard to physical climate risks, e.g. when structural adaptation measures increase resource or energy requirements. However, there are often overlaps between the two types of targets, as climate protection measures frequently contribute simultaneously to reducing physical climate risks. Regulatory frameworks such as the EU Taxonomy and the CSRD reinforce the importance of systematically addressing climate risks and opportunities within organisations. Whilst the Taxonomy, within the framework of its DNSH criteria, requires an analysis of climate risks to demonstrate compliance with the Taxonomy, the CSRD requires transparency regarding whether and how such risks are identified, integrated into strategy and managed.

Ideally, targets should be developed on the basis of the upstream climate risk analysis, in which the relevant physical risks are identified and prioritised according to their impact and consequences (see chapter 5). As with other objectives, targets should be formulated using the S.M.A.R.T. framework and linked to clearly defined key performance indicators. This makes progress measurable and enables regular review and, where necessary, adjustment of the targets. Furthermore, adaptation targets should be defined in such a way as to facilitate the development and selection of adaptation measures. The target system acts as a connecting element between risk analysis, strategic management and operational implementation.

Examples of targets could include:

- **Physical risks:**
  "Ensuring that by 2035, all sites at risk of flooding have feasible flood protection plans in place."
  More generally: "Reducing the proportion of assets exposed to physical climate-related risks by 50% by 2045."

- **Transition risks**
  "By 2035, 40% of the company's total electricity generation capacity is to come from renewable energy sources in order to minimise risks arising from rising energy costs."
  More generally: "Reduce the proportion of assets exposed to transition risks by 50% by 2045."

7 Action – Planning and implementing measures

Action: How do I use this chapter?

- This chapter shows how measures to reduce climate impacts and climate risks can be planned and implemented.
- An overview provides examples of measures for reducing GHG emissions in Scopes 1, 2 and 3.
- Remaining emissions that have not yet been avoided can be offset. This chapter outlines requirements for offsetting without the associated stigma of greenwashing.
- Climate risks and impacts can be reduced through climate adaptation measures.

Underlying elements in the catalogue of requirements (see Annex A.3)

- Programmes of measures (see requirement 5.1)
- Climate protection projects outside the organisation's own value chain (see requirement 5.2)

7.1 Key aspects of planning and implementing measures

Planning and managing measures in such a way that the agreed targets can be achieved is a key aspect of climate management. This includes not only measures to reduce climate impacts but also measures that address the identified climate risks and opportunities. The measures must be designed and combined in such a way that the climate targets defined by the company (see chapter 6) are achieved.

In principle, the two steps of 'setting targets' and 'taking action' should be coordinated as closely as possible, as the interdependencies are clear: **defining targets without measures (and their implementation) is ineffective, whilst defining measures without targets is haphazard.** Measures can be derived from targets (top-down), and targets can in turn be defined from identified measures (bottom-up) – both approaches are initially equally plausible and appropriate, although in the short term the targets often arise from what can be implemented immediately (bottom-up), whilst in the long term the legally enshrined national GHG neutrality target ultimately determines the necessary measures (top-down) (see Chapter 6.1).

Due to the interdependencies described, the **definition and implementation of concrete, effective measures** go hand in hand **with ambitious targets,** and vice versa. In this context, for each measure, **alignment with the targets** on the one hand and **feasibility** on the other must be reconciled against the backdrop of the timeframe for implementation and the available or required resources. These are key elements that must be embedded in every measure within the action programme and its regular review.

The action programme is ultimately a list of individual measures, the implementation of which – as planned – ideally ensures the achievement of the organisation's climate targets. If the action programme does not yet comply with the targets at the start of climate management, it should be supplemented accordingly through regular **adjustments**. The establishment, implementation, regular review and adjustment of the action programme are essential components of climate management and correspond to a **PDCA** ({xe "**PDCA**" \t "*Plan, Do, Check, Act*"}) **cycle**, as defined in other management systems, such as ISO 9001:2015 or ISO 50001:2018.

7.2 Prevention and reduction – climate protection measures

Climate protection measures are highly diverse and can (and should) be categorised, grouped and structured according to a wide range of criteria. One option is to classify the measures according to the three scopes set out in the GHG Protocol. An alternative is to classify them according to the fields of action or areas of impact of the climate protection measures (see Table 16). These measures are supplemented by climate adaptation measures (see chapter 7.3).

The following table provides an illustrative overview of various types of climate protection measures. This classification also shows that measures often cannot be assigned to individual scopes and that a cross-scope view of the interrelationships between measures is helpful.

Table 16 : Overview of exemplary climate protection measures by action areas

Action area	Description	Typical measures
Zero-emission energy supply	Replacement of fossil fuels with renewable or zero-emission alternatives	Own renewable energy generation (PV, wind, solar thermal) Purchase of certified green electricity Switch to alternative energy sources (e.g. biogas, biomethane) Use of renewable district heating Internal waste heat utilisation/heat recovery
Use of materials and resources	Product design adjustments, measures to reduce material use or waste, and circular economy.	Resource-efficient product design Substitution of high-emission materials Closing internal material cycles Take-back and reuse systems Prevention of refrigerant emissions
Mobility and transport	Adaptation of operational transport processes.	Electrification of vehicle fleet Business travel policies to avoid high-emission modes of transport Optimisation of logistics processes Promotion of zero-emission commuting
Technology and operations	Holistic optimisation of technical systems and operational management.	System optimisation: consumption, distribution, generation, procurement Loss minimisation (e.g. leaks, insulation) Optimised process control, operation and regulation of systems Load management to utilise low-emission time slots Minimum efficiency standards for energy-consuming products (processes, infrastructure) Process conversion (e.g. electrification)
Personnel, organisational and strategic measures	Creating the necessary conditions, raising awareness, supporting the implementation of technical measures	Training and qualifications on climate protection topics Internal communication on GHG-related topics Optimising data collection and accounting (e.g. Scope 3) Integrating climate criteria into decision-making processes Participation in climate protection and energy efficiency networks

Ultimately, specific measures always **depend on the individual company,** the **sector** or industry, the products manufactured and the processes involved, as well as the supply of utilities (e.g. the supply of heating, cooling or compressed air to consumers, and the existing infrastructure). Location-specific aspects may also play a role, for example regarding access to energy supply infrastructure. Therefore, proposed measures must always be tailored to the specific circumstances of the company in question.

Good practice example: the ECB's action plan

As a key public institution in the European Union, the European Central Bank (ECB) plays a pioneering role in environmental management. It is registered under the EU Eco-Management and Audit Scheme (EMAS) and certified to ISO 14001. It is working to reduce its own environmental impact and integrate environmentally friendly practices into its operational activities through an action plan, with the aim of reducing its operational carbon footprint by 46.2% by 2030 compared to 2019. In doing so, the ECB takes into account all GHG emission categories in accordance with the GHG Protocol: direct GHG emissions from its own facilities and vehicles (Scope 1), indirect GHG emissions from electricity and heat consumption (Scope 2); and extensive indirect GHG emissions along the upstream and downstream value chain (Scope 3), such as those from business travel, commuting or purchased goods and services. The latter account for the largest share of the carbon footprint, at around 90%. To effectively reduce these GHG emissions, the ECB is relying on a mix of technical innovations and organisational measures. For instance, the vehicle fleet is being supplemented with electric and hybrid vehicles, and the useful life of vehicles is being extended. At the same time, the switch to 100% renewable electricity and improvements in energy efficiency in buildings are ensuring a reduction in Scope 2 emissions. The greatest challenge, however, lies in indirect Scope 3 emissions, which the ECB is addressing through measures such as halving the number of in-person meetings and promoting hybrid meetings. A digital tool is designed to make the GHG emissions from events transparent and thus actively manageable. The package is complemented by sustainable catering, the digitalisation of processes and binding criteria in tenders with environmental relevance. Since 2020, the ECB has been continuously measuring its progress, reporting transparently to senior management, its staff and the public, and has been offsetting unavoided GHG emissions since 2018 by purchasing credits that finance emission-avoidance projects worldwide. Thanks to detailed emissions measurement, targeted technical and organisational measures, and binding management tools, the ECB is succeeding in measurably reducing its environmental footprint and establishing a practical model for effective climate protection.

Further information is available at: https://www.ecb.europa.eu/ecb/climate/green/html/ecb.environmentalstatement202507.en.html

7.3 Climate adaptation measures

In addition to measures to avoid or reduce GHG emissions, those that increase resilience or reduce climate-related risks should also be included. The way in which these measures are organised – whether in a separate climate adaptation programme or alongside climate protection measures – can be structured differently depending on requirements. A separate programme may be one option, but is not mandatory. It should be made clear which of the identified risks the measures address and what contribution the measures make at which level of the organisation. Such an adaptation plan is also required under the CSRD; ESRS E1 requires reporting on ongoing and planned measures for adaptation to climate change.

As described in Chapter 5 , the first step is to assess the organisation's current and future adaptability (e.g. financial resources, available staff). Subsequently, organisational and technical measures to reduce the identified risks are developed and consolidated into a plan. In accordance with the risk definition from Chapter 5 , these measures can address either the vulnerability of the system or the impacts on the system. This means that measures can, on the one hand, mitigate the risk by reducing the probability of climate-related hazards (e.g. selecting an alternative location not exposed to flooding). On the other hand, a measure can address the sensitivity of the system to reduce the impacts in the event of an incident (e.g. constructing dykes in the event of flooding).

Table 17 : Overview of exemplary climate adaptation measures

Area of action	Area	Objectives of the measure
Zero-emission energy supply (resilience aspect)	PV system with storage	Ensuring the power supply in the event of a system-related grid failure (e.g. for cooling, IT, pumps)
	Combination of PV and green roof	Reduction of heat islands, simultaneous energy generation
	Emergency power supply from renewable sources	Protection of critical infrastructure during extreme weather
	Diversification of energy sources	Combination of district heating, waste heat recovery and biomass to ensure reliability
Use of materials and resources	Use of heat- and water-resistant building materials	e.g. UV-resistant facades, water-repellent floor coverings
	Rainwater harvesting	Relief for the sewerage system during heavy rainfall, supply during dry periods
	Infiltration areas & retention roofs	Protection against flooding, improvement of the microclimate
	Green facades & roofs	Heat protection, evaporative cooling, biodiversity
Mobility & transport	Weather-protected bicycle parking spaces	Promotion of sustainable mobility, even during heavy rain
	Adjustment of delivery times and routes	Response to flood, heatwave or storm warnings
	Training for drivers	Behaviour during extreme weather, emergency routes, communication
Technology & operations	Backflow valves & pump systems	Protection against flooding in underground car parks and plant rooms
	Avoiding technical equipment in basements	Protection against flooding by relocating sensitive technical equipment
	Fans & air conditioning systems	Heat protection in production halls
	Weather data monitoring	Early warning systems for heavy rain, heat and storms
	Adaptation of ventilation/air conditioning systems	Design for higher outdoor temperatures

Area of action	Area	Objectives of the measure
Organisational & strategic measures	Scenario planning for outages	Contingency plans for electricity, water and supply chains
	Flexible working arrangements	Working from home or flexitime during extreme weather (e.g. heat, icy conditions)
	Heat protection action plans	e.g. break arrangements, drinking stations, rescheduling of working hours
	Training on extreme weather & emergencies	How to behave in the event of heat, storms, flooding or evacuation
	Integration into business continuity management	Climate risks as a fixed component of risk analyses
	Scenario planning & drills	Evacuation drills, blackout tests, communication chains
	Cooperation with local authorities & networks	e.g. participation in local adaptation projects

7.4 The action programme: prioritisation and monitoring of measures

The action programme, which generally includes both GHG reduction measures and the measures from the climate adaptation plan, is the result of a prioritisation process and serves to steer measures that may result from the application and individual refinement of the aforementioned types of measures. The action programme is the central management tool for the successful implementation of measures. In principle, measures that lead to a direct reduction in GHG emissions should be prioritised over measures for GHG removal and offsetting measures. This is also a requirement of ISO 14068-1:2023. Measures to mitigate climate risks must also be integrated into the action programme.

Furthermore, the prioritisation of climate protection measures for inclusion in the climate management action programme follows two key principles:

- firstly, the measures must be consistent with the achievement of targets within the relevant time horizon, in particular the target of GHG neutrality;
- secondarily, the measures must be selected and designed in such a way that they contribute to the targets as cost-effectively as possible.

The two fundamental principles are therefore, first and foremost, enabling the achievement of targets and, secondarily, cost-effectiveness or economic efficiency. The following tables illustrate a possible programme of measures

Table 18 : Exemplary programme of measures – Emission-side savings (compiled from various companies)

ID	Priority*	Title of measure	Brief Description of measure	Planned in tCO_2-eq/a	Achieved in tCO_2-eq/a	Data quality of (achieved) savings	Impact
1	medium	Insulation of heating pipes	Insulation of uninsulated pipework (200 m, DN 65) to reduce heat loss	15	14	Calculation	Reduction in natural gas consumption
2	high	Refrigeration Replacement	Replacement of a refrigeration system using R134a refrigerant with a system using R290 (propane)	10	11	Measurement of energy consumption and refrigerant quantities (top-up) before and after implementation of measures	Refrigerant with low GWP (3 instead of 1,430)
3	High	Electrification of hardening furnace	Conversion of a gas-fired hardening furnace to electric induction technology to reduce CO_2 emissions	300	300	Measurement of GHG emissions before and after implementation of measures	Substitution of natural gas use
4	medium	Biogas production from waste materials	Organic production residues for biogas production in a biogas plant, use of biogas for heat generation	3,300	3,300	Measurement of GHG emissions before and after implementation of measures	Substitution of natural gas use
5	medium	Recirculation of cooling water	Reuse of slightly contaminated cooling water for cleaning processes			Calculation	Water savings

Table 19 : Exemplary programme of measures – monetary savings (compiled from various companies)

ID	Priority*	Title of measure	Brief Description of measure	Investment in €	Planned annual cost saving in €/a	Achieved annual cost savings in €/a	Internal rate of return (IRR)	Net present value (return) in €	Payback period (risk) in years
1	medium	Insulation of heating pipes	Insulation of uninsulated pipework (200 m, DN 65) to reduce heat loss	20,000	2,800	3,000	11.0%	2,357	6.5
2	high	Refrigeration Refrigerant exchange	Replacement of a refrigeration system using R134a refrigerant with a system using R290 propane as the refrigerant	160,000	-1,100 (additional electricity consumption due to lower efficiency)	-1,200	-	Neg.	-
3	high	Electrification of hardening furnace	Conversion of a gas-fired hardening furnace to electric induction technology to reduce CO_2 emissions	7 million					
4	million	Biogas production from waste materials	Organic production residues for biogas production in a biogas plant, use of biogas for heat generation	10 million					
5	funds	Recirculating water use	Reuse of slightly contaminated cooling water for cleaning processes	80,000					

Table 20 : Exemplary programme of measures – effectiveness (compiled from various companies)

ID	Priority*	Measure title	Brief Description of measure	Person responsible	Start of planning phase	Planned implementation by	Status of implementation	Proof of implementation
1	medium	Insulation of heating pipes	Insulation of uninsulated pipework (200 m, DN 65) to reduce heat loss	Mr Meier, Facility Management	24 Jan	25 June	Implemented	Link to invoice
2	high	Refrigeration Replacement	Replacement of a refrigeration system using R134a refrigerant with a system using R290 propane as the refrigerant	Ms Müller, Facility Management	24 Sept	25 Feb	Implemented	Acceptance report, Invoice for refrigeration unit
3	high	Electrification of hardening furnace	Conversion of a gas-fired hardening furnace to electric induction technology to reduce CO_2 emissions	Production line, hardening shop	Jan. 23	Apr. 25	Implemented	Acceptance report
4	medium	Biogas production from waste materials	Organic production residues for biogas production in a biogas plant, use of biogas for heat generation	Production management, Facility Management	Mar. 20	Dec. 22	Implemented	Acceptance report
5	means	Recirculating water use	Reuse of slightly contaminated cooling water for cleaning processes	Head of Facility Management	23 Apr	Dec. 23	Under review	

Practical guidance: Dealing with measures involving external service providers / contractors (outsourced activities)

In practice, it is often the case that only the potential and emissions of a company's own operational activities are assessed. However, for holistic climate management, it is essential to also take outsourced activities into account – particularly those falling under Scope 2 and Scope 3 of the GHG inventory.

The feasibility of implementing climate protection measures with external partners varies greatly and depends heavily on the scope for influence and the nature of the business relationship. Measures can, for example, be implemented via the following channels:

- Contractual requirements (e.g. minimum standards in tenders)
- Industry guidelines or certifications
- Joint target agreements within the framework of partnerships
- Partnerships for the development and implementation of specific climate protection measures

A particularly effective approach is active two-way communication between the client and the service provider. This allows concrete measures along the supply chain to be discussed, evaluated and further developed jointly.

Enabling the achievement of targets

The absolute or relative GHG reduction potential should be used as criteria for assessing how measures contribute towards targets. These contributions should correspond to the definition of climate targets, which are also specified as absolute or percentage reductions compared to the base year. Absolute reductions are often preferable as target and monitoring metrics and, in many cases, represent a sensible target and monitoring metric. At the same time, however, there are measures – particularly those aimed at reducing the product-related carbon footprint, such as material substitution or adjustments to product design – where relative GHG reductions are the primary focus and are therefore used as suitable metrics. In the context of achieving GHG neutrality, these are ultimately indispensable.

As with the accounting of GHG emissions, which can be assigned to specific scopes, areas of action or activity metrics, the assessment of potential and impact and the monitoring of climate protection measures also involve first measuring, calculating or estimating metrics/performance indicators that the measure affects and that correspond to the respective area of action.

The determination of the savings potential resulting from the implementation of measures is derived from the definition of the impact on business processes and activities and the associated climate impacts, e.g. using emission factors. The latter should be consistent across all measures in the action programme as well as for the GHG inventory.

In principle, the potential assessment of climate protection measures is based on the operational status quo of a defined base year, which is generally consistent with the base year for GHG accounting. For energy-related measures, an inventory of the initial energy situation is helpful for this purpose. Provided there is a sufficiently robust data basis, the energy consumption can already be broken down by energy source into application areas (e.g. individual production facilities or parts of the utility supply, such as compressed air compressors) during the accounting process. The application-oriented emissions balance derived from this identifies emissions hotspots and serves as a basis for an initial prioritisation of measures. The information on the current status also serves as a basis for quantifying GHG reductions achieved through individual

climate protection measures. A wide variety of data sources can be used to determine the extent of GHG reduction: measurements, calculations or estimates for the current status and GHG reduction are possible. The level of detail and data quality can be gradually refined in the process.

Cost-effectiveness/economic viability

To determine the cost-effectiveness or economic viability of measures, the resources required for their introduction and implementation must be identified and – where possible – converted into monetary terms.

For capital expenditure measures, a life-cycle cost analysis should be carried out, taking into account investments and ongoing operating costs (or differences in operating costs compared to the status quo), including personnel costs. If the company is subject to emissions trading (ETS I and/or ETS II or national emissions trading in accordance with the Fuel Emissions Trading Act (BEHG**{**xe "BEHG" \t "*Brennstoffemissionshandelsgesetz*"**}){** XE "BEHG" \t "*Brennstoffemissionshandelsgesetz*" **}**), savings on expenditure for the purchase of emission allowances must also be taken into account. Alternatively, an economic assessment of the avoided emissions can also be carried out using a CO_2 shadow price. This can be done, for example, using an in-house estimate based on current energy system scenarios to anticipate the future $_{CO_2}$market price. In addition, current estimates of $_{CO_2}$damage costs, as published by the UBA (see Matther 2024), can also be used. According to these, $_{CO_2}$damage costs currently stand at €300/t $_{CO_2}$.

For the assessment of economic viability, the calculation methods and standards in accordance with DIN EN 17463 (VALERI) should be used. The net present value method specified therein is mandated in a wide range of energy and climate-related laws and regulations for determining economic viability.

Accompanying measures

In some cases, it may happen that measures cannot be assessed (fully) in economic terms. This is particularly the case with organisational and behavioural measures, such as those aimed at motivating and training employees. In such cases, either the expenditure or the resources required for the measure cannot be meaningfully assessed in monetary terms ex ante, or the effect of the measure cannot be directly attributed to a cost reduction, an improvement in results, or a reduction in GHG emissions. These are then referred to as *accompanying measures*. They play a supporting role in the programme of measures and, although difficult or impossible to measure using quantitative metrics, can be highly relevant to the implementation or to enhancing the effectiveness of other, quantifiable measures within the programme. One example is internal information and communication aimed at bringing about behavioural changes among employees.

Elements of the action programme and monitoring of implementation

The monitoring of measure implementation is based on the specifications regarding the timeline, the required resources and the responsibilities for measures. The appropriate level of specificity and detail in the action programme cannot be generalised and depends, among other things, on the respective management and communication culture within the company. For example, it may make sense for one company to group various overarching measures under the responsibility of a single organisational unit, whilst for another company it may be helpful to break down a complex task into several (sub-)measures in order to manage it effectively.

Content and outcome of the measures

To allow for a clear allocation of measures, the action plan contains a meaningful description for each measure, which sets out both the content and the expected outcome. The assignment of, for example, identification numbers may also be useful for controlling purposes in this context.

Scheduling with interim targets/milestones

The schedule for each measure includes a clear start date, a target date for the measure's implementation, and, depending on the measure, additional planning points for the implementation or achievement of interim targets.

Responsibility and accountability

A person responsible for each measure is appointed, who, within the company's climate management structure (see chapter 2), is responsible for implementing that specific measure. This person is responsible for

- providing the necessary personnel, financial and material resources,
- monitoring their individual measure(s),
- in particular for adhering to the implementation schedule and, where necessary, adjusting the schedule in consultation with the person responsible for the action programme and climate management, as well as those involved in the implementation of the individual measure
- as well as for reviewing the effectiveness of the measure.

The persons or organisational units responsible in each case should, as a rule, be in a position to ensure the necessary conditions for success (budget, staff, internal resources and capacities). If responsibility is placed at too high a level, there is a lack of understanding of the specific prerequisites for successful implementation. If it is placed at too low a level, internal conflicts of interest (staff, budget and resources) cannot be resolved.

Resource planning

In addition to the overview in the action programme, it is advisable to define for each individual measure which resources are required for implementation and when, and who will provide these resources. The nature and scope of the resources vary depending on the measure; the most relevant resource categories are:

- Capital for the procurement of plant, equipment and services
- Equipment, operating resources and services already available within the organisation
- Human resources

In addition to these planning and control elements, the action programme contains, where possible, the information mentioned above regarding GHG savings and costs/cost-effectiveness for each individual measure.

7.5 Offsetting – Counterbalancing unavoided greenhouse gas emissions

In addition to its own measures to reduce GHG emissions, the company can purchase carbon credits on the voluntary market to provide financial support for climate protection projects outside its value chain. These **credits do not affect the actual carbon footprint, as described in chapter 4**.

Info box: Emissions trading vs. the voluntary market – what is the difference?

The **EU Emissions Trading Scheme (EU ETS)** is a mandatory system across all 27 EU Member States, as well as Norway, Iceland and Liechtenstein. All companies participating in the EU ETS must submit one allowance for every tonne of CO_2 equivalent emitted. Allowances can be issued either as free allocations or through auctioning on the market (sale or auction). The total quantity of allowances is limited and is gradually reduced to cut emissions. This system is required by law and serves to ensure compliance with binding climate targets.

The **voluntary market,** on the other hand, is aimed not only at companies but also at other organisations and private individuals. By purchasing carbon credits, these parties make a financial contribution to climate protection without being obliged to do so. This enables the targeted financing of climate protection projects that reduce greenhouse gas emissions (e.g. the construction of a wind turbine or the generation of biogas in the domestic sector). Offsetting, i.e. the mathematical balancing of GHG emissions, is achieved through emission reduction credits. In addition, credits for carbon removals are also offered, for which the permanence of the removal is of primary importance.

As reducing one's own emissions is always preferable to offsetting through the purchase of carbon credits, offsetting remaining emissions should be the last resort. Remaining emissions refer to those GHG emissions that persist after all technically and economically feasible reduction measures have been implemented.

This is also reflected in the regulations of various standards and requirements:

- The SBTi provides methods for companies to set targets for reductions of GHG emissions within their own boundaries or along their value chain. The use of carbon credits must not be counted as an emissions reduction towards achieving short- or long-term science-based targets. This means that companies cannot purchase carbon credits to replace reduction measures.
- According to ISO 14064-1, carbon credits must be listed separately from GHG reduction measures in reports.
- The ESRS E1 also provides for separate reporting. Disclosure requirement E1-7, 'Removal of greenhouse gases and greenhouse gas reduction projects financed through CO_2 credits', requires, among other things, the reporting of the total quantity of carbon credits procured and retired during the reporting period. In order for the allowances to be taken into account in the reporting requirement, they must meet recognised quality standards.

Offsetting is then carried out via carbon credits, which are used to offset GHG emissions in full or in part through climate protection projects. If the company decides to voluntarily fund climate protection projects, it should – as far as possible – ensure that the emission reduction or GHG removal from the relevant climate protection projects:

- is additional, i.e. would not occur without the project;
- does not result in higher emissions elsewhere or cause an unreasonable detriment to other legal interests;
- is guaranteed in the long term (particularly in the case of biogenic sink projects/carbon removals);
- contributes to sustainable development in the project region beyond climate protection;

- is not already being used by other organisations for voluntary offsetting or by states to fulfil national or international climate protection obligations, and that double counting, double use or double claiming are excluded;
- is verified by independent experts with regard to compliance with generally accepted standards.

Such climate protection projects are implemented, for example, in the fields of renewable energy, energy efficiency, agriculture or forests/forestry. There are numerous providers of offset services. These providers purchase carbon credits from project-developing institutions or their own projects and broker the credits to buyers. In this way, funding is secured for the relevant climate protection projects. A reputable offset provider supports its clients by offering appropriate advisory services or information to help them reduce emissions in the first place. Furthermore, it provides transparent information on the types of projects and the countries from which the carbon credits originate, as well as the quality standards underlying the implementation, validation and verification of the projects and the quantification of reduced GHG emissions or additional GHG removals. In recent years, numerous standards have become established in the dynamically growing market for voluntary offsetting. International standards such as the Verified Carbon Standard (VCS) and the Gold Standard dominate the majority of the market. In the guide 'Voluntary CO_2 offsetting through climate protection projects', the UBA explains in more detail what matters when it comes to offsetting (Federal Environment Agency (2018)).

8 Communicating – Information and reporting on climate protection

Communicating: How do I use this chapter?

- This chapter outlines the possibilities, requirements and limitations of communication regarding climate management.
- Benefits of internal and external communication on climate management
- Examples of successful communication

Underlying elements in the requirements catalogue (see Annex A.3)

- Internal communication (see requirement 6.1)
- Climate reporting (see requirement 6.2)

8.1 Communication – who, what and how

Communication is crucial to successful climate management. On the one hand, employees and senior management within the organisation must be on board. On the other hand, a decision must be made as to whether and how information on climate management should also be communicated to external stakeholders such as business and contractual partners, the media and the wider public. The following provides an overview of the possibilities, requirements and limitations of communication regarding climate management, with separate sections on internal and external communication.

Communicating about a company's own climate management has major advantages. It can promote transparency both **within the company** and towards the public. Transparent communication builds trust and conveys a clear picture of the company's goals and measures. This trust can have a motivating effect on employees within the company. Knowing that they work for a company that is actively and credibly committed to the climate can increase employee loyalty. The content of communication measures can and should also be designed in such a way that the communication boosts employee motivation and encourages the workforce, for example, to support, initiate or even implement climate management within the company. **Communication with the public** can also generate a positive external image if it is credible and fact-based. In this way, communication can clearly position the company and, furthermore, set standards within its industry and play a leading role in shaping its development.

In some cases, communication is not only a sensible option but also mandatory. For EMAS and companies subject to CSRD reporting requirements, there are obligations under which reports must also be made publicly available. Sustainability reporting under the CSRD applies to large companies and is integrated into the annual management report; EMAS reporting takes the form of an environmental statement, which may stand alone or form part of a more comprehensive sustainability or management report. In both cases, the reports are subject to external verification: for the CSRD by auditors, and for EMAS by accredited environmental verifiers. Unlike EMAS and the CSRD, which require external communication, standards such as ISO 14001 on environmental management, ISO 50001:2018 on energy management or EN 16247-1:2012 for energy audits do not prescribe mandatory external communication. However, energy management in accordance with ISO 50001:2018 must include an internal communication strategy and employee involvement. Employee involvement has two components: Firstly, employees' awareness should be raised. This requirement can also be applied to climate management: communication

should be designed in such a way that employees are aware of the company's climate policy and realise their own contribution to the success of the climate management system, or to the reduction of the company's GHG emissions, as well as the consequences of non-compliance. Secondly, all employees should be given the opportunity to actively contribute to the climate management system, for example by making suggestions for reducing GHG emissions or climate risks. Suggestions for a communication strategy are presented in the next section.

8.2 Internal communication

Internal communication aims to involve all stakeholders within the company in the climate management process, to motivate them and to ensure their participation. It must be tailored to the specific audience and target group and is aimed in particular at two key groups: senior management and employees. The workforce gathers and communicates relevant information to senior management, and communication directed at the workforce is particularly effective when accompanied by clear positioning and exemplary behaviour from senior management, which emphasises the importance of climate management for the company.

Communication with employees serves several purposes: it should inform, motivate and empower them to participate actively. The aim is to raise awareness of the purpose and significance of climate management and to clarify the employees' own role within the company's overarching energy and climate strategy. Suitable tools for this include regular training sessions, internal campaigns, and communications and announcements from senior management. Highlighting and jointly celebrating success stories throughout the process can have a particularly motivating effect. Staff cooperation in systematic data collection and the implementation of climate protection measures is crucial for successful climate management. Training programmes should therefore encourage this cooperation by emphasising practical approaches, clearly communicating responsibilities, and illustrating and reinforcing opportunities for action in day-to-day work. Furthermore, a clearly defined process with binding commitments is necessary. A communication strategy can help to provide clarity: this includes responsibilities and, where applicable, an organisational chart (who communicates, who supports what), defined data collection processes (what data is collected, how often, by whom, and where), target audiences for communication (who is being communicated with), as well as communication formats (e.g. meetings: who attends, how often, on what topic, where are the results documented and to whom are the results forwarded, if applicable). Communication is conceived here not merely as a one-off task, but as an ongoing process that is regularly reviewed and adapted

Internal communication should not be viewed merely as a one-way process in which employees are informed, motivated and encouraged to take action; rather, it should be a two-way process in which employees are actively involved to foster innovation and improvements. Examples of meaningful employee involvement include setting up working groups to identify measures, targeted surveys on opportunities for improvement, training courses, or participation in internal climate audits. Involving trainees, for example as 'energy scouts', can also improve climate communication (see https://career.ebmpapst.com/de/de/teams-and-stories/overview-stories/energyscouts.html).

Support from senior management is crucial to the success of climate management, as otherwise many measures may not even be adopted or may stall. Only in this way can synergies between climate and other aspects be harnessed and potential conflicts of interest resolved. This support encompasses both a commitment to the cause and the prioritisation of climate management amidst the company's other activities and tasks, as well as the provision of personnel, resources and budget. Involvement through regular reports, for example via management reviews, is necessary to ensure that senior management is aware of information relevant to decision-making regarding targets, target achievement, conflicting objectives, as well as risks and opportunities.

In addition to the top management, other managerial roles, particularly those with responsibility for personnel and budgets, must also be involved. As their decisions directly influence the success of the climate strategy, they too must be informed, made aware of the issues and involved in the process. If senior management goes beyond these tasks to demonstrate commitment in internal and external communications and makes the priority of climate management clear in their conduct and actions – for example, through a declaration of commitment from top management – this credibly emphasises the importance of climate management.

8.3 External communication

In addition to communication within the company itself, decisions must be made regarding whether, why, how, when and what information on climate management is also communicated to external stakeholders.

For EMAS and the CSRD, there are precise requirements regarding the content and frequency of reporting on environmental and climate-related aspects to ensure standardised and transparent communication. For instance, the environmental statement in accordance with Annex IV of the EMAS Regulation requires, among other things, information on environmental objectives as well as a summary of the available data on environmental performance, including the core indicator 'emissions'. Companies subject to CSRD reporting for which climate change is a material reporting topic must apply the ESRS E1 reporting standards and the reporting requirements contained therein. In contrast, the publication of a greenhouse gas report in accordance with ISO 14064-1 is voluntary. In addition to these mandatory reporting requirements, there are also various voluntary frameworks for sustainability reporting. These include, for example, the EFRAG VSME standard, which offers small and medium-sized enterprises (SMEs) an alternative to the binding EU Sustainability Reporting Standards (ESRS). Beyond these standardised reports with key figures, voluntary informal communication can be useful for conveying knowledge, values and competitive advantages to external stakeholders.

Systematic approaches, transparency and credibility are also essential in external communications. To this end, companies should ensure that their statements are precise and verifiable. Particular attention is drawn to the interfaces between voluntary and mandatory sustainability reporting. Ambiguous claims may arise if voluntary disclosures do not align with reports published under EMAS or the CSRD. It would be possible to exploit such inconsistencies between different reporting formats strategically to highlight certain aspects or obscure problems, which could lead to unfair competition. Integrating voluntary and mandatory reporting thus creates transparency.

A strategic inconsistency between advertising claims and verifiable measures can not only damage a company's reputation but is also legally risky. Even under the national legal framework in force prior to 2026, there were lawsuits and court rulings against misleading or unverifiable environmental claims. These include, for example, six new lawsuits and 28 further proceedings

Good practice example: Putting employees at the centre at Heel – implementation of ISO 50001:2018 and ISO 14001:2015 through clear communication and participation

When introducing the management systems in accordance with ISO 14001:2015 (environment) and ISO 50001:2018 (energy) in 2024, the pharmaceutical company Biologische Heilmittel Heel GmbH relied on targeted, employee-focused communication. A structured approach ensured that everyone was informed at an early stage, engaged in a way they could understand, and actively involved – including with their own ideas. Sustainability was not viewed as an additional issue, but as an equally important prerequisite for the company's success, on a par with quality and productivity.

This is also reflected in Heel's Production-Operations Triangle: sustainability, customer focus and competitiveness together form the strategic basis. At the heart of this: employees as active contributors.

Existing communication formats such as team meetings, EHS inspections and discussions with managers and safety officers are used in a targeted manner. A digital reporting tool, originally designed for workplace accidents, was expanded to also record environmental and energy-related incidents – based on the principle: one tool for all situations.

The PREXT Day (Production Excellence Training), in which all 400 supply chain employees take part, played an important role. In 2024, it focused on environmental and energy management. The management systems are not viewed as an obligation, but as tools for better processes, targeted resource use and greater standardisation.

Safety officers were also involved as key contributors through the "SiBes support our SiFa" programme. For three months, they actively collaborated within the EHS department, thereby achieving cross-departmental, practical involvement. The programme has received widespread external recognition, having been awarded the BG RCI Vision Zero Promotion Prize in 2022 and nominated for the German Occupational Safety and Health Award 2025.

Workplace-specific instructions, an updated EHS manual and checklists supported implementation. The process was further supported by an information evening for managers and other internal measures, e.g. on the intranet.

Communication did not end with certification. The formats will continue to encourage dialogue and feedback in the future. In this way, environmental and energy management remains embedded in day-to-day operations as part of a continual improvement process.

initiated by Deutsche Umwelthilfe in September 2025 against various companies (Deutsche Umwelthilfe, 2025) . In similar previous court cases, the verdicts often confirmed that the defendants' previous advertising was misleading (Deutsche Umwelthilfe, 2024). This previous case law was based on the interpretation of current competition and consumer protection law (e.g. Section 5 of the Unfair Competition Act). From 2026, the legal basis for such proceedings will become even clearer: the EmpCo Directive will then come into force and a decision will be made on the planned Green Claims Directive.

The Empowering Consumers Directive (EmpCo Directive{xe "EmpCo-RL" \t "*Empowering Consumers for the Green Transition-RL*"} ; Empowering Consumers for the Green Transition Directive, EU 2024/825) has been in force at EU level since March 2024 and must be transposed into national law by March 2026 at the latest. The Green Claims Directive, originally planned as a supplementary measure, was proposed for withdrawal by the European Commission in mid-2025, but has not yet been formally withdrawn; its future is currently uncertain. All environmental claims communicated externally by a company must, upon the entry into force of the national implementation of the EmpCo Directive (Directive (EU) 2024/825 of the European Parliament and of the Council of 28 February 2024 amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and through better information (Text with EEA relevance), 2024) must be substantiated and verifiable, and reference must be made to this evidence when the relevant statement is communicated.

Practical guidance: Communication of environmental claims

Environmental claims communicated about a company, a product or a service (e.g. 'recycled') should be specific (e.g. 'packaging made from 100% recycled paper') and verifiable through supporting evidence. Descriptions such as 'climate-neutral', 'climate-friendly', or similar should not refer to the offsetting of CO_2emissions, but exclusively to the actual life cycle of the product or service. The use of recognised certificates or standards can create certainty, comparability and trust (e.g. ISO 14068-1 on carbon neutrality). Communicated targets (e.g. "we will be climate-neutral by 2035") should also be specific (e.g. "by 2035, we will reduce our emissions by x% compared to 2010") and backed up by concrete measures that clearly outline the plan for achieving this target.

A detailed overview of possible strategies for the responsible use of environmental claims and labels, and thus for avoiding accusations of greenwashing, is provided in the final report on requirements and verification obligations for 'climate-neutral companies', which was produced by a project team led by dena on behalf of the then Federal Ministry for Economic Affairs and Climate Action (BMWK) (see BMWK (2024)).

Without specific requirements for climate management, it is difficult to compare the GHG inventories of different companies. The previous chapters described the choice of system and inventory boundaries, as well as the selection of Scope 3 categories. The current scope for discretion available to companies means that the GHG inventories of different companies are not comparable with one another. Where GHG inventories have been calculated using different requirements regarding data sources and methodology, comparisons between different companies should therefore be avoided. Similarly, comparing one's own organisational or product GHG inventory with that of competitors is, in most cases, not meaningful. By avoiding misleading comparisons or conclusions, stakeholder trust can be maintained.

Conversely, concerns about accusations of greenwashing and other backlash have led some companies to continue their commitment to the climate whilst no longer speaking publicly about their efforts: this as yet little-known counterpart to greenwashing is known as greenhushing (Font et al., 2017; Hilton, 2025) . Depending on the socio-political context, either too few or too many publicly visible climate protection measures can become a political issue. However, such a defensive communication strategy reduces the guidance available to customers and diminishes the importance of sustainability in the public debate. With responsible and verifiable external communication, companies can instead not only highlight their own efforts and present themselves authentically, but also help shape the debate in the public sphere and within their own industry, thereby setting industry standards.

Successful communication must be tailored to the target audience. Potential target groups include, for example, customers, suppliers and other contractual partners (retail), the press, the company's own industry and, where applicable, industry associations, (potential) investors, the local community or lenders. The Sustainable Finance Disclosure Regulation (SFDR) imposes requirements on banks regarding sustainable investments, meaning that environmental metrics are likely to become increasingly important in discussions with credit institutions. Depending on the structure of the company's client base, contractual partners can be divided into further subgroups, each requiring different information or different approaches. When communicating key figures, product passports and Environmental Product Declarations (EPDs –{xe "EPD" \t "*Environmental Product Declaration*"}) can be taken into account, as they offer standardised data formats that facilitate comparability. Just as in internal communication, it is essential to view communication as a two-way process so that questions and criticism can be raised and addressed; and just as in internal communication, a structured communication concept with defined responsibilities (who communicates), target groups (to whom), communication channels (by what means) and content (what) is required here too, in order to ensure consistently high quality and effectiveness in external communication. Communication is only one part of a comprehensive and long-term collaboration.

Good practice example: WALA's EMAS environmental statement

WALA Heilmittel GmbH demonstrates how climate management can be successfully implemented through long-term objectives and transparent, authentic external communication. As early as 2001, the company switched to 100% green electricity – the start of a systematic reduction in operational GHG emissions. Based on its own corporate values, WALA is pursuing the goal of reducing GHG emissions by at least 85% by 2030 compared to 2019 – embedded within the comprehensive EU environmental management system EMAS.

In doing so, WALA not only fulfils its reporting obligations under EMAS in a formal sense, but also uses the environmental statement specifically as a strategic tool to communicate its own climate strategy in a transparent and open manner – including to the interested public, customers and business partners. Progress, conflicting objectives and unresolved issues are not glossed over, but rather reflected upon transparently and critically. This is particularly evident in the emissions accounting: whilst Scope 1 and Scope 2 emissions are reported in full, WALA is actively working on the gradual recording of Scope 3 emissions. This gap is not concealed, but is openly presented as part of a continual improvement process.

In addition to the comprehensive presentation within the framework of EMAS reporting, WALA also provides a further assessment of the climate impact of its own business activities in its report by using an X-Degree Compatibility model (XDC model{xe "XDC-Modell" \t "*X-Degree-Compatibility-Modell*"}). This translates the company's emissions intensity into an easily understandable metric: the projected global warming in degrees Celsius if all companies worldwide were to generate the same level of emissions per unit of value added as WALA. The current figure stands at 1.4 °C for Scope 1 and 2 and 2.0 °C for Scope 3, bringing the total to 1.9 °C. This method of presentation enables a realistic assessment of the measures taken and progress made to date.

In doing so, WALA demonstrates how external communication can be used as an integral part of credible climate management: not merely as a presentation of successes, but as a transparent dialogue about goals, challenges and learning processes.

Further information at: https://www.wala.world/files/wala/footer/fakten/WALA-Umwelterklaerung.pdf

9 Review – Conducting climate management audits

Review: How do I use this chapter?

- This chapter describes the benefits of internal and external reviews.
- It provides information on different kinds and types of audits.
- It highlights what should be reviewed and how often.
- It highlights the necessity and content of an annual management review.
- Finally, it provides information on the possible content, documentation and auditors for external audits, e.g. within the framework of existing auditable standards.

Underlying elements in the catalogue of requirements (see Annex A.3)

- Review of climate management (see requirement 8.1)
- Management review (see requirement 8.2)

9.1 Continual improvement and ongoing review through audits

Any form of review of the implementation of climate management contributes significantly to strengthening credibility and can provide incentives for improvement. For internal and external audits, different types of audit can generally be used, each relating to the specific context:

System audit (normative requirements):

A system audit verifies whether a management system (MS) has been established that meets the requirements of the underlying standard or internal management guidelines. For a climate management system, the defined scope, organisational leadership and structures, procedures for measuring greenhouse gas emissions and for planning reduction measures, and the associated communication processes would be subject to assessment.

Performance audit (internal requirements / results):

A performance audit examines the extent to which the management system is effective. Among other things, the following questions are the focus:

- Is the climate management system being used by staff?
- Is it practical, or are there conflicting framework conditions?
- Can the targeted climate goals (GHG emission reduction targets, goals for managing climate risks and opportunities) be achieved?

Furthermore, the performance audit serves to identify potential for improvement in relation to processes and target achievement. It also examines whether the climate targets have been consistently pursued and achieved on the basis of the measures and the climate protection programme.

Compliance audit (legal requirements):

A compliance audit serves to verify compliance with legal regulations and other binding obligations.

The various types of audits can be carried out either as internal audits (first-party audits) or as external audits by third parties. Internal audits do not replace the annual management review by the organisation's top management, but are rather an important prerequisite for it. External audits can be divided into second-party and third-party audits, with the main difference being the independence of the auditing body. Second-party audits are usually carried out by customers, suppliers, partner organisations or commissioned consultancy firms that have a direct business relationship with the audited company. Alternatively, second-party audits may also be carried out by a parent company or subsidiary. In contrast, third-party audits are carried out by completely independent, external organisations, such as accredited certification bodies.

An internal audit forms a mandatory basis of any management system and must therefore also be carried out within the framework of a climate management system.

In addition to internal or external auditing, the climate management system requires a process and evidence of continual improvement. This encompasses all elements of the climate management system and must therefore be incorporated as a defined procedure within the environmental policy and internal business processes. The internal improvement of the climate management system takes place continually, independently of the auditing process: progress towards targets is assessed at regular intervals.

To this end, climate-related metrics are recorded, which are typically reported as absolute – and, where applicable, adjusted – GHG emissions under Scope 1, Scope 2 and the key Scope 3 categories. In addition, specific indicators are presented, for example in tonnes of CO_2-equivalent per product unit, tonnes of CO_2-equivalent per million Euros of turnover, or tonnes of CO_2-equivalent per site. These indicators are then analysed and assessed in terms of progress towards achieving the targets.

This review is carried out several times during the year; the frequency is determined either by the management, as the body ultimately responsible for the effectiveness of the climate management system, or by the company's designated staff responsible for its operation. However, it is recommended that updates and reporting take place at least every six months within the company to enable early assessment of potential developments and the ability to make adjustments. In addition, a management review is conducted by top management at least once a year to ensure compliance with the environmental policy. This iterative process ensures that the system is continually adapted to new requirements, risks and opportunities, and that the effectiveness of the measures to achieve the climate targets is regularly reviewed.

Management review

At least once a year, the organisation's top management assesses the suitability, adequacy and effectiveness of the climate management system with regard to:

- the achievement of climate targets,
- the provision of sufficient financial, human and technical resources,
- the integration of climate management into the organisation's structures, strategies, objectives, financial planning and business processes.

As part of this review, potential for improvement and the need for adjustments to climate management and the climate protection and adaptation programme are also identified. Where necessary, the degree of implementation of the transformation plan is also reviewed and the adequacy of measures to increase resilience to significant climate risks is assessed.

The basis for this is provided by the current climate reporting metrics, an overview of the status of measures, the assessment of overarching climate risks and opportunities, and the results of

internal and external audits. At the end of the management review, it must be clearly evident what effort and what personnel, financial and technical resources are required for production, the production environment and, where applicable, product functions in order to successfully implement the ambitious climate strategy. In addition, an assessment should be made as to whether any adjustments to the measures are necessary.

The results and implications of the management review must be documented.

9.2 Internal audits

The review of a climate management system should take place at defined intervals, at least once a year, depending on the size of the company and its environmental impact. Depending on the circumstances, individual focus areas of the internal audit may also be implemented over the course of the year, such as the planning process for measures to meet climate targets. The audit must take into account both the normative requirements of the climate management system (system audit) and internal guidelines (performance audit) as well as legal requirements (compliance audit). Particular attention should be paid to the completeness and up-to-date nature of GHG emissions accounting, e.g. whether Scope 3 emissions can still be classified as insignificant or whether the emission factors used are still current.

Overall, audit planning must primarily take into account changing external and internal conditions, as these may affect the intended processes and objectives and may require adjustment. This is of particular importance if, for example, the scope, context or responsibilities of the organisation change. If there is any suspicion that the responsibilities, procedures and structures relating to climate protection are not effective, a detailed assessment is essential.

The review should therefore take into account at least the following aspects:

- the current pathway to achieving climate protection targets (GHG emission reduction targets), taking into account the latest scientific findings (e.g. IPCC or UNFCCC assessment reports), as well as the appropriateness of the measures for achieving these targets;
- the timeliness of GHG emissions accounting;
- the relevance of climate risks and opportunities (transition risks, physical risks) and the adequacy of climate measures to address these risks and opportunities;
- the effectiveness of the processes for managing its significant climate impacts, risks and opportunities;
- compliance with legal and other obligations (binding commitments).

Drawing up an audit plan and programme for internal audits

Audits are planned taking into account the relevance of the respective areas to the organisation's climate impacts. Within a three-year cycle, every area and every responsibility that influences environmental aspects should be internally audited at least once (external organisations may also be involved in this process). This ensures that all relevant aspects are systematically reviewed and continually improved.

Areas relevant to emissions are audited annually or at least more than once every three years. Particular attention must be paid to the process for tracking climate targets and the implementation of the action and climate protection programme, as the organisation's strategic focus is on a business model aligned with the 1.5 °C target and the achievement of GHG neutrality as the central objective of climate management.

The agenda for internal audits should primarily include the following aspects and, overall, cover all normative aspects of climate management:

- Interview with senior management regarding changes in the context of the organisation as a whole, new stakeholder demands, targets, and the organisational and reporting boundaries, as well as the responsibilities, processes and structures relating to climate protection
- Interview with the climate management officers regarding the current status of climate risks and opportunities, as well as the status of targets and measures
- Review of data flow activities ('data path') from the primary data source (meters, invoices, process control system) through to the GHG model for Scope 1–2, involving all relevant departments
- Interview with production management regarding further potential GHG sources in the production area
- Interview with the HR department regarding potential Scope 3 emissions (employee commutes, business travel, purchased goods and materials, etc.) and employee suggestions for GHG reductions
- Interview with the procurement department to identify further GHG data in the supply chain
- Interview with the development team regarding potential savings in current product development and current topic-specific priorities

Practical tip: Setting priorities

Specific priorities should be set for internal audits on a case-by-case basis, which can be defined by the climate management officers or management. For example, it could be checked whether the relevant individuals are familiar with, apply and consistently comply with the climate policy and legal requirements, or whether the planned measures remain effective in achieving the target.

Depending on the audit content and the circumstances at hand, the audit should be conducted using one of the following methodologies:

1. Document review (approvals, contracts, minutes, greenhouse gas reports, etc.) via a desk-based review with opportunities for clarification
2. Random sampling of greenhouse gas inventories and other quantifiable data (invoices, delivery notes, extracts from financial accounts)
3. On-site inspection of conditions to verify the completeness of GHG sources and to review the assumptions underlying the accounting of GHG emissions for Scope 1 and 2
4. Interviews and consultations with those in charge, those responsible and those affected, either as part of the on-site inspection or as separate appointments (virtually or by telephone)

An example audit programme could be structured according to the measures listed in Table 21 (an additional breakdown by site or environmental aspect may be necessary).

Table 21 : Climate management audit content in an exemplary audit programme

ID	Standard element	Responsible	Mandatory (annual)	Year (0)	Year (+1)	Year (+2)	Year (+3)
1	Environmental analysis	GF, KM		x			x
2	Defining the scope	KM		x			x
3	Management system	KM		x			x
4	*Responsibility of senior management	Managing Director	x	x	x	x	x
5	Senior management's commitment to climate protection and climate adaptation	GF		x			x
6	Responsibilities	PA		x			x
7	Employee involvement	PA, KM		x		x	
8	Climate impacts	KM, FE, PO		x	x		
9	*Determination and accounting of GHG emissions and their sources	KM,FE	x	x	x	x	x
10	Capturing other climate impacts	KM, FE, PO		x			x
11	Climate risks and opportunities (transition risks and opportunities, as well as physical climate risks)	KM+FE		x	x		x
12	Binding commitments	KM		x		x	
13	Climate targets and key figures	GF, KM		x			x
14	*Planning of measures (Action and Climate Protection Programme)	KM, PO	x	x	x	x	x
15	*Climate protection projects outside our own value chain	KM	x	x	x	x	x
16	*Communication	MA	x	x	x	x	x
17	Operational planning and control	KM		x		x	x
18	Review, evaluation and improvement	GF, KM		x		x	x
19	*Management review	Managing Director, KM	x	x	x	x	x
20	Improvement	KM		x			x

Source: Own representation

9.3 External audits

So-called 'third-party' audits are carried out by independent, accredited organisations or environmental assessors and are therefore frequently used as a basis for legal requirements or state aid procedures.

External verification by an independent body enhances the credibility of climate management systems and all published environmental information. The priority is to ensure that the audit is comprehensive, independent and free from conflicts of interest. This requires that the auditing body was in no way involved in the development or implementation of the climate management system, the calculation of GHG emissions or the setting of targets and measures.

The principle of external verification is to compare the organisation's implemented processes and collected information with the requirements set out in the catalogue of requirements for transparent and verifiable climate management, and to identify any potential deviations. In addition to checking for fundamental deviations from formal requirements, such as the existence of a management review or a climate adaptation programme, the external review also includes a technical assessment as well as an examination of the suitability, completeness and accuracy of the calculations and analyses carried out. If the review of specific data and information aims to ensure compliance with a specific intended application, this is referred to as **verification**. If, however, the review takes place within the framework of a climate management system with the aim of transitioning to a greenhouse gas-neutral, 1.5 °C-compatible society, it is referred to as **validation**[9] .

A research project conducted by the Federal Environment Agency assessed which audit priorities should be set for the external auditing of a climate management system and what qualification and accreditation requirements should be imposed on the auditors[10] . The findings indicated that, following selective adjustments to the technical competence guidelines, environmental verifiers would be sufficiently competent to assess the processes and information of a climate management system. A heuristic approach based on empirical evidence and plausibility checks was preferred, as – similar to the European Emissions Trading Scheme – the focus should not primarily be on ensuring a correct data basis, but rather on the climate protection measures and the climate protection programme based on it.

Advantages of an external review

An external review can bring a number of benefits:

1. Credibility and trust: transparency and reliability of the data and environmental targets, as well as the associated climate protection and climate adaptation programme
2. Legal certainty: Where legal requirements exist, an external review is generally mandatory. Such a review can also be advantageous in cases of warnings and legal disputes, helping to strengthen one's legal position.
3. Continual improvement: Insights and feedback from independent experts can provide valuable impetus for the further development of climate management.
4. Improved data quality: Weaknesses in data collection, methodology, data presentation or the reference sources used can be identified and rectified.
5. Competitive advantages: An externally audited climate management system can be advantageous in public tenders or when presenting the company.

[9] Definition of terms in accordance with 3.2 and 3.3 of DIN EN ISO/IEC 17029:2020-02, whereby verification relates to historical data and information, whilst validation is geared towards a specific intended future use or application.

[10] Work Package 2: Deriving tasks and qualifications for the assessment and review of a climate management system for the research project 'Further development of technical foundations for the environmental and climate management system and the greenhouse gas neutrality of organisations' (Research ID 3717 13 102)

6. Internal awareness-raising: Through an external audit, an organisation demonstrates its commitment to climate protection and its responsibility towards the climate targets it has set for itself.

What aspects are assessed during the audit?

The requirements of the audit, whether conducted internally or externally, identify key areas of focus for climate management that must be assessed during the audit. These are analysed in more detail below**:**

The review of a climate management system involves, on the one hand, assessing the management-related processes and procedures in terms of their impact, appropriateness and functionality, and, on the other hand, ensuring that the reliability, credibility, accuracy and plausibility of the data and information can be sufficiently guaranteed. Both aspects – data quality and the underlying management processes – are interdependent. A lack of robust management-related structures increases the risk of data and information being insufficiently reliable. For this reason, climate management must always be assessed in the overall context of the data generated from it.

Effective climate management and its review should therefore encompass both an analytical examination of the collected data (performance audit) and a thorough assessment of the underlying management processes and internal regulations (process audit). Only by combining these two perspectives can the functionality and reliability of the entire climate management system, with its various stages and processes, be ensured.

The content of the review must be aligned with the climate management requirements and assessed holistically. Particular focus should be placed on the context, the climate impact and the organisation's resulting climate action programme, as these constitute the central components of an effective climate management system.

Consequently, the organisation should provide a well-founded statement and analysis, which must be reviewed with regard to the following aspects: Table 22 provides, as a guide, an illustrative list of the audit content and key areas relating to the important topic of context analysis and the scope of application. This should be assessed in advance by the organisation and made available to the auditors beforehand.

Table 22 : Guidance for the audit: Context analysis and scope

Requirement (short)	Audit content
Does the organisation have an understanding of the transition to a greenhouse gas-neutral, 1.5 °C-compatible society (context), the expectations of internal and external interested parties, the context analysis and the value chain (e.g. in accordance with ISO 14067:2018 or the GHG Protocol PCF)?	**Identification of relevant internal and external issues** Have all relevant issues affecting climate management been included? These include, amongst others, the legal framework, technical conditions, changes in the climate or the customer environment. Have the two perspectives of double materiality been sufficiently taken into account? **Procedure for identifying climate aspects** Is there a defined and documented procedure for identifying and recording all relevant climate aspects (e.g. in accordance with Chapter 1.4.5 of the EMAS Manual)? **Assessment criteria for impacts and materiality** Have internal and external assessment criteria been established, and are these applied appropriately with regard to their impacts and materiality on the organisation? **Consideration of the entire value chain**

Requirement (short)	Audit content
	Are all significant activities and climate aspects along the value chain taken into account, e.g. by applying standards such as ISO 14067:2018 or the GHG Protocol Product Carbon Footprint (PCF)? **Consideration of motivation and drivers for the climate management system** Have the motivation and driving factors for the organisation's greenhouse gas inventory been identified and taken into account? **Use of context analyses from other management systems** Has the context analysis from other management systems (e.g. ISO 9001:2015, ISO 50001:2018) been taken into account when identifying environmental and climate issues?
Has the organisation's scope of application for climate management been correctly determined?	**Coverage of the scope** Does the climate management system cover at least the head office and all relevant sites where high GHG emissions or climate risks arise? Are both direct and indirect climate impacts that can be controlled by the organisation taken into account? **Consideration of context and stakeholder analyses** Are the results of the context and stakeholder analysis reflected within the defined scope? Have relevant requirements and expectations derived from these been incorporated into the scope? **Reflection of relevant changes** Have all relevant organisational, operational or other changes over the past year been correctly taken into account within the scope of application? **Inclusion of subsidiaries and associated companies** Have subsidiaries or associated companies whose emissions or energy consumption are relevant been included? **Determination of data on GHG emissions and climate risks** Is the information on GHG emissions and climate risks sufficiently complete and accurate for relevant sites, activities, products and services? Are emissions and climate risks along the value chains also taken into account? **Appropriateness of the scope** Does the defined scope correspond to the intended purpose of the climate management system? Are all relevant areas covered to fulfil the purpose? **Transparency regarding exclusions** Are any omissions or limitations within the scope transparently and comprehensibly justified? **Consideration of sector-specific reference documents** Have sector-specific reference documents, e.g. in accordance with Article 46(1) of the EMAS Regulation, been taken into account when defining the scope?
Is the organisation's management system effective and is it put into practice?	**Integration of processes and structures into existing procedures:** Are the relevant processes and structures (e.g. process control[11] , responsibilities, communication channels, organisational structure) integrated into existing procedures in such a way that they function smoothly, synergies are exploited and conflicts are avoided?

[11] Process control encompasses the structured organisation and chronological sequence of tasks, responsibilities and resources for the implementation of climate protection and climate adaptation measures. It serves to ensure that measures are carried out efficiently, effectively and in compliance with regulations.

Requirement (short)	Audit content
	How well are specific climate management requirements integrated into existing management systems (e.g. quality, energy or environmental management)? Are there clear interfaces and responsibilities? Are existing work processes being adapted or redefined to meet the requirements of climate management? **Establishing the purpose of climate management:** Is the purpose of the climate management system (avoidance/reduction of GHG emissions, management of transition risks, physical risks and displacement risks) sufficiently embedded in the management processes? Have key control instruments such as procurement guidelines or action plans been adapted accordingly? Are regular environmental analyses and risk identification carried out? Is there a monitoring system in place to track progress towards achieving targets? Is the PDCA cycle (Plan-Do-Check-Act) consistently applied, e.g. in management reviews or when planning measures? **Alignment of targets and measures with the 1.5°C target** Are the formulated climate targets consistent with national and international climate targets (e.g. the 1.5°C target)? Is there a valid and documented climate programme with clearly defined individual targets and measures? Are the measures regularly reviewed and adjusted where necessary? Are the targets quantifiable and measurable? **Assessment and decision-making criteria for implementing measures** Have clear criteria been defined for prioritising and implementing measures? Do the criteria take into account both short-term and long-term effects? Are environmental, economic and social aspects taken into account in the evaluation? Is there transparent and traceable documentation of decision-making? **Governance structures for implementing the objectives and measures** Are governance structures (responsibilities, communication channels) clearly defined and documented? Are there formal commitments and declarations of commitment from senior management to meet climate targets? Have sufficient human and financial resources been allocated for implementation, i.e. are there staff requirements plans, job descriptions or specific resource plans for specific projects? Are all relevant functions, organisational units and stakeholders involved and do they coordinate effectively? How is the topic of climate management embedded within the organisational structure (e.g. a dedicated unit, integration into existing management systems)?

Practical note: Greenhouse gas emissions in environmental statements

In November 2024, the Secretariat of the Environmental Verifiers Committee published guidance for environmental verifiers on the verification of GHG emissions in environmental statements under EMAS (link).

What documents and audit procedures are required as part of the assessment?

For climate management, existing documentation from energy or environmental management should be expanded in line with an integrated management system. The evidence therefore essentially relies on the following mandatory documents:

1. Environmental analysis (context)
2. Methodological descriptions and analysis of the results of the stakeholder survey (including existing survey records, which can be viewed on a sample basis)
3. Documentation of the organisational and corporate structure (organisation chart, extracts from the commercial register, control agreements, legally binding self-declaration, etc.)
4. Climate policy or guidelines
5. Management handbook or descriptions
6. Job descriptions (at least for the climate management officer and project manager)
7. Process description/regulations for monitoring (management review) and competence matrix, including training concept
8. Climate protection and climate adaptation programme or transformation concept
9. Data compilation and calculations for the GHG reduction pathway
10. List of assessment criteria for residual GHG emissions and GHG removal measures
11. GHG accounting (analysis of direct and indirect climate impacts, list of all direct and indirect environmental aspects (including GHG sources), GHG inventory, description of criteria for the significance of environmental aspects, historical base year and the base-year-related GHG inventory)
12. Evidence of fuel, energy and material flows (internal and external documentation from inventory management and accounting, annual accruals, stock-takes)
13. Production data to validate the quantities of energy/fuel used, information on operations and on planned or actual changes to the plant (activity rates)
14. Report analysing climate opportunities and risks as well as transition risks
15. Legal register for compliance with binding obligations
16. Methodological description/explanation for determining key performance indicators and assessing the effectiveness of measures
17. Offset measures: Carbon credits, proof of cancellation, further information on compliance with the defined criteria (additionality, no unreasonable impact, permanence, contribution to sustainable development in the project region, double counting exclusion, independent verification)
18. Internal process instructions/description for the publication of 'environmental information', including a climate report where applicable
19. Structured improvement and action planning (CIP)

Who is authorised to assess and validate climate management?

To date, climate management has not yet been established as a voluntary or mandatory component within EMAS or other legal regulations. An independently applicable and verifiable system or normative standard such as an ISO or DIN standard does not yet exist. Consequently, climate management could be voluntarily integrated into existing verification systems for GHG accounting and environmental management systems. Therefore, in principle, assessments should only be carried out by persons who are accredited or authorised to assess at least one of the following standards:

1. Verification and validation bodies in accordance with DIN EN ISO/IEC 17029 for the validation and verification of greenhouse gas statements (ISO 14064-3:2019)
2. Assessments in accordance with 'Assurance Engagements other than Audits or Reviews of Historical Financial Information' (ISAE 3000) and 'Assurance Engagements on Greenhouse Gas Statements' (ISAE 3410) by auditors

3. Validation in accordance with EMAS by environmental verifiers
4. Certification of environmental management systems in accordance with ISO 14001:2015 (Environmental Management Systems) by accredited certification bodies

Practical note: Databases for auditors

The recognised verification bodies are listed in the publicly accessible databases of the relevant accreditation authorities:

- Environmental verifiers: DAU database (Link: https://www.dau-bonn-gmbh.de/dauAd-rList.htm?cid=209)
- Verification and validation bodies and certification of environmental management systems in accordance with ISO 14001:2015: DAkkS database (Link: https://www.dakks.de/de/akkredi-tierte-stellen-suche.html)
- Chartered Accountants: Professional Register/Register of Auditors maintained by the Chamber of Chartered Accountants (Link: https://www.wpk.de/beruf/berufsregis-ter/berufsregister-abschlusspruefferregister/

10 Improving – fine-tuning activities for climate protection and climate adaptation

Adapt: How do I use this chapter?

- This chapter outlines the procedure for dealing with non-conformities and deviations.
- Both reactive and proactive measures should be implemented and their effectiveness reviewed.
- It provides information on the importance of continual improvement.

Underlying requirements (see Annex A.3)

- Improvement (see requirement 8.3)

If, during the audit of the management system, it becomes apparent that there are weaknesses or deviations from the requirements (non-conformities), that implementation in practice is not taking place, or that improvements are possible, adjustments and corrections should be made. A structured approach is recommended here, with which deviations can be avoided in the long term and non-conformities proactively. The recommended steps for identifying a non-conformity are listed below:

1. Analysis and evaluation

a) of the underlying aspects and causes

b) of the deviation itself

c) The potential or actual consequences

2. Identification of appropriate and proportionate actions

a) Reactive corrective action(s)

b) Proactive measure(s) to address the cause(s) and prevent recurrence

3. Determination of a suitable method for verifying the effectiveness of the planned measure(s)
4. Implementation of the measure(s)
5. Monitoring the implementation and effectiveness of the measure(s)
6. Checking whether similar deviations are possible and proactively developing activities to prevent them

In principle, the types of non-conformities and corrective actions, as well as their results and effectiveness, should be documented in writing. The procedure or process should also be documented in writing in the form of a structured approach.

In principle, the climate management system sets high standards, including with regard to a continual improvement process for climate protection and climate adaptation. This can already be addressed in climate policy. Continual improvement does not mean that an improvement in climate indicators or targets (e.g. reduction of climate impact) must be achieved every year. However, over a longer period, it should be clearly evident that the management system is leading to improvement. To achieve this improvement and embed the necessary structures within the organisation in a sustainable manner, all the stages listed in the guidelines are required.

- Establishing an **organisational structure** that enables continual improvement of climate management. This includes clearly defining **roles and responsibilities**, formulating a

company-wide **climate policy**, and systematically analysing **opportunities and risks** within the business environment and among relevant stakeholders.

- To determine in which areas improvements can be achieved, the **scope** of climate management must be clearly defined.
- An assessment of **the current situation** is essential for the development of targets and measures.
- Derivation of S.M.A.R.T. **climate targets** based on the analysis of the current situation, and close linking of these targets to concrete, prioritised **measures**.
- Establishment of transparent **internal and external communication** to ensure the credibility of climate protection, inform and engage stakeholders, and promote acceptance and participation.
- Regular **monitoring of progress** to assess whether targets are being met and, where necessary, to adjust measures based on the findings.

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A Appendix

A.1 Terminology

Table 23 : Definition of relevant terms

Term	Explanation
Binding commitment	Legal and contractual obligations that an organisation must fulfil, or which an organisation decides to fulfil (e.g. voluntary commitments).
Climate impact	Negative contributions of an organisation's activities, products and services to climate change through the emission of greenhouse gases or other activities that may have a warming effect on the Earth's climate system, e.g. the emission of water vapour.
Climate management	Totality of structures, processes and measures by which an organisation manages its climate impacts and climate risks. (Source: based on the definition of a management system in *ISO 14001:2015)*
Greenhouse gas emission	The release of a greenhouse gas into the atmosphere (Source: *ISO 14050:2020*)
Greenhouse gas emission source	A process by which a greenhouse gas is released into the atmosphere. (Source: *ISO 14050:2020*)
Greenhouse gas neutrality	A state in which no more greenhouse gases are emitted into the atmosphere than are removed from the atmospheric cycle. (Source: based on IPCC SR1.5 Glossary "Net zero emissions")
Greenhouse gas sink	A process in which a greenhouse gas is removed from the atmosphere. (Source: *ISO 14050:2020*)
Physical climate risks	Risks to which the organisation is exposed due to the potential direct and indirect consequences of climate change. (Source: based on TCFD) *Note: This encompasses both the consequences of gradual climate change (so-called chronic risks, such as sea-level rise or habitat shifts) and the consequences of extreme weather events, which may occur more frequently or with greater intensity as a result of climate change (so-called acute risks, such as droughts, heavy rainfall, storm surges or heat-waves).*
Shift effect	The shifting of climate impacts that would have arisen within an organisation to other actors in the upstream or downstream value chain, or outside the organisation's value chain.
Transition risks	Risks arising for the organisation as a result of the transition to a greenhouse gas-neutral society. (Source: based on TCFD)
Voluntary offsetting	Offsetting remaining emissions through financial contributions to climate protection projects.

A.2 Legal requirements and standards relating to climate management

Table 24 describes legislation, standards and norms that are essential for climate management and the handling of GHG emissions within the organisation.

Table 24 : Relevant legislation, standards and norms

Name	Category	Key content
EU Emissions Trading Scheme (EU ETS) 2003/87/EC	EU Directive[12]	The EU Emissions Trading Scheme is the key market-based instrument for reducing GHG emissions in the energy and industrial sectors, as well as in parts of the aviation and maritime sectors, and is based on a cap-and-trade approach. The *Monitoring Regulation* defines how direct GHG emissions must be accounted for. National implementation in Germany is carried out via the *Greenhouse Gas Emissions Trading Act*. The *Fuel Emissions Trading Act* supplements a national emissions trading scheme for the buildings and transport sectors, which will also be introduced at EU level in future via the EU ETS 2.
Monitoring Regulation 2018/2066	EU Regulation[13]	The Monitoring Regulation defines, among other things, how GHG emissions from installations and processes must be reported under the EU ETS.
Greenhouse Gas Emissions Trading Act (TEHG)	Legislation	The TEHG serves to implement the *EU Emissions Trading Directive 2003/87/EC*, which regulates trading in CO_2allowances.
Fuel Emissions Trading Act (BEHG)	Legislation	Regulates the trading of CO_2allowances in the heating and transport sectors at national level, as these are not covered by the *EU ETS*.
EU Taxonomy Regulation 2020/852	EU Regulation	The Taxonomy Regulation sets out the criteria used to assess whether an economic activity can be classified as environmentally sustainable. To qualify, it must make a substantial contribution to at least one of the EU's environmental objectives, cause no significant harm to the other environmental objectives ('Do no significant harm'), and comply with minimum social standards. Companies falling under the EU regulations on sustainability reporting (CSRD) must, among other things, report on the proportion of taxonomy-compliant activities.
Taxonomy – Delegated Regulation 2021/2139	EU Regulation	Definition of the technical assessment criteria for *the EU Taxonomy Regulation 2020/852* regarding the environmental objectives of climate action and climate adaptation. The document is organised into different economic activities. For some activities, the GHG emissions across the entire life cycle must be taken into account to verify whether the activity makes a significant contribution to achieving the climate objective. The calculation must be carried out in accordance with *Commission Recommendation 2013/179/EU* or, alternatively, *ISO 14067:2018* or *ISO 14064-1:2018*.

[12] Definition of an EU directive: Legal acts that do not apply directly and must be transposed into national law by the Member States in order to be valid.

[13] Definition of an EU regulation: A legal act of the European Union with direct effect in the Member States.

Name	Category	Key content
Corporate Sustainability Reporting Directive (CSRD) 2022/2464	EU Directive	Since 2017, a non-financial reporting requirement has been in force in Germany and the EU for certain large companies, which was comprehensively revised in 2022. The updated EU Directive on sustainability reporting emphasises uniform reporting standards for companies on environmental, social and governance issues, known as the European Sustainability Reporting Standards (ESRS). The Directive came into force in 2024 and was intended to be gradually extended to more companies. As part of the European Commission's simplification agenda, the scope of the reporting requirements will in future be limited to companies with more than 1,000 employees and an annual turnover of more than €450 million.
European Sustainability Reporting Standards (ESRS)	Standard[14]	The ESRS define sustainability reporting standards for the implementation of the CSRD. The ESRS E1 reporting standard sets out the requirements for reporting on climate action, climate adaptation and energy. Among other things, companies must report on their climate action transition plan, material climate risks, climate-related corporate policies, measures and targets, as well as energy consumption, GHG emissions, GHG removals and the use of CO_2allowances from the voluntary market.
EMAS Regulation (EC) No 1221/2009	EU Regulation	Regulates the voluntary introduction of an environmental management system and an environmental audit for companies. EMAS incorporates all the requirements of *ISO 14001*. In addition, it provides for verification by state-accredited and supervised environmental verifiers, external reporting, registration in a public register, the involvement of the environmental authority and permits the use of a standardised EMAS logo.
Industrial Emissions Directive (IED) 2010/75/EU	EU Directive	The Industrial Emissions Directive (IED) comprises a broad set of regulations for the monitoring of emissions from industrial installations in the EU, particularly regarding authorisation, operation and monitoring. Of particular relevance are the conclusions on best available techniques regulated by the IED. In Germany, national implementation is carried out through the *Act Implementing the Industrial Emissions Directive (IndEmissRLUG).* The amendment to the IED was adopted in 2024 and must be transposed into national law by 2026.
Energy Efficiency Directive 2012/27/EU and its amendment 2023/1791	EU Directive	The Energy Efficiency Directive sets out minimum requirements for improving energy efficiency in EU Member States and is of particular importance for industry and commerce. The Directive stipulates that energy audits must be carried out regularly and mandatorily in companies (reference to *ISO 50001:2018* and *EN 16247*). In Germany, corresponding requirements have already been implemented through the Energy Efficiency Act (EnEfG) and the Act on Energy Services and Other Energy Efficiency Measures. By 2025, the new directive will completely replace the previous one.

[14] Definition of a standard in this guide: Documents that set out requirements and recommendations for organisations, products or processes and, within the scope of this report, describe a model, repeatable approach to dealing with GHGs or energy.

Name	Category	Key content
Energy Efficiency Act (EnEfG)	Legislation	The EnEfG establishes, for the first time, a cross-sectoral legal framework to improve energy efficiency in Germany. It sets binding targets for final and primary energy consumption and implements key provisions of the EU Energy Efficiency Directive (EU) 2023/1791. Companies that have achieved an average total final energy consumption of more than 7.5 GWh per year over the last three completed calendar years are obliged to introduce an energy management system in accordance with ISO 50001 or an environmental management system in accordance with EMAS by 18 July 2025 at the latest.
Act on Energy Services and Other Energy Efficiency Measures (EDL-G)	Legislation	The Energy Services Act (EDL-G) aims to improve energy consumption and energy efficiency among end customers and in companies, and serves to implement Directive 2012/27/EU at national level. Companies that are not small and medium-sized enterprises (SMEs) as defined by the EU are obliged to carry out an energy audit in accordance with DIN EN 16247-1 at least every four years. Simplified reporting or verification requirements apply to companies with very low energy consumption.
PAS 2060 Carbon neutrality	Standard[15]	Definition of requirements for the quantification, reduction and offsetting of GHG emissions for organisations and products. PAS 2060 from the UK is thus the internationally recognised standard for GHG neutrality; it will be replaced by *ISO 14068-1:2023* from 30 November 2025.
Corporate Standard GHG Protocol	Standard	Internationally recognised standard for the accounting of GHG emissions and removals by private and public organisations. In the GHG Protocol, GHG emissions are classified into Scope 1, 2 and 3 categories. Other closely related standards include the Scope 2 Guidance and the Scope 3 Standard under the GHG Protocol.
Scope 2 Guidance GHG Protocol	Standard	This standard is an extension or supplement to the Corporate Standard and sets out the methodology for accounting for Scope 2 emissions. Scope 2 covers indirect emissions from externally purchased energy, such as electricity, district heating, steam or cooling.
Value Chain (Scope 3) Standard GHG Protocol	Standard	The standard is an extension or supplement to the Corporate Standard and sets out the methodology for accounting for Scope 3 emissions. Scope 3 emissions encompass emissions from a company's upstream and downstream value chain. They are divided into 15 different categories and include, for example, emissions resulting from purchased goods and services, employee commuting or waste treatment. The Scope 3 Standard is supplemented by Scope 3 Calculation Guidance.
Science Based Targets Initiative (SBTi)	Standard	The SBTi's calculation approaches help to set company-specific targets and pathways for reducing GHG emissions that are assessed as being in line with the Paris Agreement. GHG

[15] Definition of a standard in this guide: All standards drawn up by the International Organization for Standardization, one of the three European standardisation committees, or national standardisation bodies (e.g. the German Institute for Standardisation or the British Standards Institution).

Name	Category	Key content
		emissions for the definition of reduction targets are recorded in accordance with the *GHG Protocol* standard.
DIN EN ISO 14064-1:2018 GHG emissions at organisational level	Standard	Definition of requirements for the quantification and reporting of GHG emissions at organisational level.
DIN EN ISO 14067:2018 Carbon footprint of products	Standard	Definition of requirements and guidelines for the quantification of the corporate carbon footprint of products.
ISO 14068-1:2023 Climate change management Transition to net zero Part 1: Carbon neutrality	Standard	Definition of requirements for the quantification, reduction and offsetting of GHG emissions for organisations. *ISO 14064-1:2018* or the GHG Protocol must be used for GHG reporting.
ISO 50001:2018 Energy management system	Standard	A globally recognised standard for an energy management system, enabling organisations to measure and analyse their energy consumption and continually improve their energy performance. In addition to these aspects, the standard also requires the implementation of a management system within the organisation.
ISO 14001:2015 Environmental Management System	Standard	A globally recognised and widely applied standard for an environmental management system in companies and other organisations. It sets out the requirements for such a system.
DIN EN ISO 14090:2021 Adaptation to the consequences of climate change – Principles, requirements and guidelines	Standard	The standard provides a strategic framework for integrating climate adaptation into decision-making processes. It supports organisations in identifying climate risks and opportunities, acting resiliently and systematically planning adaptation measures. The standard is applicable across all sectors and places particular emphasis on governance, stakeholder engagement, risk assessment and action planning.
DIN EN ISO 14091:2021 Adaptation to climate change – Vulnerability, impacts and risk assessment	Standard	The standard describes how organisations can systematically identify and assess climate-related risks and vulnerabilities. It provides a basis for informed decisions on climate adaptation, particularly in the context of planning and reporting.
EN 16247-1 Energy Audit	Standard	The standard covers the structured conduct of an energy audit for the one-off assessment of energy consumption and measures to improve energy efficiency.
EU Recommendation 2021/2279 on the application of methods for calculating the environmental footprint to measure and disclose the environmental performance of products and organisations	Recommendation[16]	Definition of EU requirements for determining the environmental footprint of products and organisations. Updated version of EU Recommendation 2013/179/EU

[16] Definition of a recommendation in this guide: Non-binding standards at international, European or German level.

Name	Category	Key content
throughout their life cycle		
Guidance on the scope and on monitoring and reporting of CO2 emissions (Federal Environment Agency)	Recommendation	The guide to the scope of application and to the monitoring and reporting of CO_2emissions defines how GHGs must be reported and recorded under the BEHG.

A.3 Checklist of requirements for climate management

Table 25 : List of requirements

Climate management elements	Basic requirements for climate management	Further requirements for climate management
1. Environmental analysis and scope		
1.1. Environmental analysis	The organisation must have a general understanding of its climate impacts and how the transition to a greenhouse gas-neutral, 1.5°C-compatible society and the consequences of climate change may affect its activities, products and services, including its business model and business relationships.	
	The organisation must identify the internal and external interested parties relevant to climate management. It must determine their requirements and expectations regarding climate action and climate adaptation, and specify which of these it intends or is required to meet.	
1.2. Determining the scope	Based on the context analysis, the organisation shall determine the scope of the climate management system so that all its activities, products and services relevant to climate action and climate adaptation are included, taking into account supply and value chains.	
1.3. Management system	The organisation must establish, implement, maintain and continually improve a management system in accordance with the requirements set out in this document, with the aim of: to prevent and reduce greenhouse gas emissions and other climate impacts (see clause 3.1.3); to prevent and reduce transition risks for the organisation and to exploit corresponding opportunities; to prevent and reduce physical risks of climate change to the organisation, or to take advantage of corresponding opportunities; achieve climate targets; to reduce energy consumption and increase energy efficiency;	

Climate management elements	Basic requirements for climate management	Further requirements for climate management
	Avoid the displacement of GHG emissions to other actors, as well as negative impacts of climate management on other environmental media, human rights and social issues.	
2. Organisational leadership and structures		
2.1. Responsibility of top management	The organisation's top management must demonstrate leadership and commitment with regard to climate management by: taking responsibility for the direction and effectiveness of climate management, as well as for its integration into the organisation's overall strategy; defining climate-related responsibilities and authorities for managers; ensuring that the financial, human and technical resources, as well as the organisational structures, required for climate management are available; ensuring and overseeing that climate protection, climate risks and opportunities are incorporated into the organisation's general strategies, objectives, risk management, financial planning and capital investments; ensures that climate management requirements are integrated into the organisation's processes and policies and are thus taken into account in decision-making;	
2.2. Commitment of top management to climate protection and climate adaptation	The organisation commits to continually reducing its climate impacts, improving its resilience to the potential consequences of climate change, and managing its climate-related risks and opportunities. It ensures compliance with its binding commitments in this area.	The organisation must draw up, implement and regularly update a climate action plan. Through the climate action plan, the organisation ensures that its strategy and business model are compatible with limiting climate change to 1.5°C and the transition to a sustainable economy. The transformation plan shall include: a 1.5°C-compatible GHG emissions reduction pathway for the organisation, against which the organisation's climate protection targets (see Section 4.1.1) are aligned; the key levers and measures the organisation intends to use to decarbonise its operations, products and services;

Climate management elements	Basic requirements for climate management	Further requirements for climate management
		the identification of, and a strategy for managing, GHG emissions that will arise in the future from the organisation's existing or planned assets and products ('locked-in emissions'); an investment strategy for implementing the transformation plan; a strategy for addressing any potential negative impacts that the implementation of the transformation plan may have on the company's employees; and an assessment of potential adverse impacts on workers in the value chain. The organisation shall ensure that the transformation plan is embedded in the organisation's overall business strategy and financial planning and that sufficient financial resources are available for the implementation of the transformation plan.
	The organisation commits to reducing all GHG emissions falling within the scope of climate management (as per Section 3.1.1) to zero by a specified target year, to the extent technically feasible. The target year must be consistent with the objectives of the Paris Agreement to limit climate change to 1.5°C (see Section 4.1) and with the climate policy objectives of Germany and the EU derived therefrom.	The organisation undertakes to neutralise unavoided GHG emissions in the target year through GHG removal measures.
2.3. Responsibilities	The organisation ensures that responsibilities for managing climate risks and opportunities, as well as for managing its climate impacts and achieving its climate targets, are defined within its organisational structure. It defines relevant tasks and functions and creates the conditions necessary for these to be carried out.	The organisation ensures that the achievement of climate protection targets and the implementation of the transformation plan are included in the performance appraisal of top management and senior executives.
	Senior management designates a contact person(s) for climate management for internal and external stakeholders.	
2.4. Involvement of employees	The organisation takes the necessary measures to ensure that: the employees and persons acting on their behalf who are necessary for the management of significant climate impacts, significant climate	

Climate management elements	Basic requirements for climate management	Further requirements for climate management
	risks and opportunities, and binding commitments are involved in climate management; the employees involved and persons acting on their behalf possess the competencies, qualifications and authority required for their tasks within the framework of climate management; employee representatives are involved in climate management, particularly in relevant decisions by top management that have or may have an impact on employees; and Employees and persons acting on their behalf are able to contribute ideas and raise concerns regarding the implementation of climate management.	
3. Identification of climate impacts, climate risks and opportunities, and binding commitments	The organisation must determine the direct and indirect climate impacts of its activities, products and services in accordance with the requirements of clauses 3.1.1 to 3.1.3.	The organisation must, as part of a preliminary analysis, identify its future potential climate impacts that may arise, for example, from unintended incidents or from strategic and operational planning. In doing so, it must also take into account its value chain as well as planned investments (assets) or developments (products) that may lead to locked-in emissions.5 To estimate future potential climate impacts, the organisation makes verifiable assumptions, in particular regarding probability of occurrence, magnitude and timeline.
3.1. Climate impacts		
3.1.1. Determination of GHG emissions and their sources	The organisation must determine the GHG emission sources that: 1) are under its operational control (direct emission sources, Scope 1 – GHG Protocol Corporate Standard). These include stationary installations, mobile installations, chemical-physical processes or fugitive emissions. 2) are not under its operational control but result in GHG emissions from the procurement and use of grid-connected energy (indirect emission sources, Scope 2 – GHG Protocol Corporate Standard). Electricity, steam, heat and cooling must be taken into account. 3) are not under its operational control but result in further GHG emissions (Scope 3 – GHG Protocol Corporate Standard). Based on the level of GHG emissions, whether direct or indirect, the organisation identifies	

Climate management elements	Basic requirements for climate management	Further requirements for climate management
	its significant GHG emission sources. To determine the significant GHG emission sources in Scope 3: the organisation must use the categories listed in the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standards (Version 2011) or DIN EN ISO 14064-1:2018 as GHG emission sources; an approximate calculation of GHG emissions is sufficient, the organisation should consider additional criteria alongside quantitative relevance (e.g. the requirements and expectations of interested parties, relevance for managing transition risks, controllability).	
3.1.2. GHG emissions accounting	The organisation shall prepare a GHG inventory for the GHG emission sources identified in accordance with 3.1.1, which complies with the requirements of the GHG Protocol Corporate Standard, and shall document in a traceable manner the data collected, methods applied and assumptions made. The greenhouse gas inventory covers direct and indirect GHG emissions for Scopes 1 and 2, as well as significant GHG emission sources (categories) for Scope 3.	
	The organisation updates its GHG inventory for Scopes 1 and 2 annually, and for Scope 3 at least every three years. Significant changes in Scope 3 emissions must be reflected in the GHG inventory without delay.	The organisation updates its GHG inventory for Scope 3 annually.
3.1.3. Recording of other climate impacts	In addition to and separately from its GHG inventory, the organisation should account for existing GHG sinks or GHG removals at its sites and within the value chain. Note: GHG sinks cannot be offset against reported GHG emissions (see Section 3.1.2) or counted towards the achievement of climate protection targets (see Section 4.1).8	The organisation supports projects aimed at securing and establishing GHG sinks or exploring opportunities for GHG removals and storage in order to achieve the long-term net-zero target.
3.2. Climate risks and opportunities	Taking into account the requirements in sections 3.2.1 and 3.2.2, the organisation identifies the risks and opportunities that climate change poses to its future position and assesses which of these are significant.	The organisation assesses annually the resilience of its strategy and business model to significant transition risks (see 3.2.1) and physical risks (see 3.2.2). It ensures that the results of the assessment are incorporated into strategic and operational planning and that measures are taken to increase its resilience.

Climate management elements	Basic requirements for climate management	Further requirements for climate management
3.2.1. Transition risks and opportunities	The organisation identifies and assesses, either quantitatively or qualitatively, the extent to which and the likelihood that its activities, products and services are or may be affected by the transition to a greenhouse gas-neutral society (transition risks and opportunities). Transition risks and opportunities include, amongst other things, political, legal, technological, market-related and reputational risks and opportunities. Note: Transition risks and opportunities may also arise from the displacement of GHG emissions to upstream or downstream stages of the value chain or outside the value chain.	The organisation shall carry out an in-depth assessment of its transition risks and opportunities based on a quantitative or qualitative scenario analysis. At least one climate scenario must be used that envisages limiting global warming to 1.5°C. To identify a range of transition risks, the organisation should consider further scenarios relevant to its circumstances. The organisation assesses the likely financial impacts on business activities, revenue, capital and operating expenditure, and the value of assets arising from its significant transition risks and opportunities.
	The organisation considers short-, medium- and long-term risks and opportunities and takes into account international, European and national climate targets when setting time horizons.	
	The organisation must assess, using transparent criteria, which of its transition risks and opportunities are significant, including in comparison with other business risks.	
3.2.2. Physical climate risks	The organisation identifies and assesses, either quantitatively or qualitatively, the extent to which and the likelihood that its activities, sites, products and services are or may be affected by the consequences of climate change. When determining the time horizons, it takes into account investment plans, the expected useful life of affected assets and findings from climate impact research.	The organisation conducts an analysis for a more in-depth assessment of its significant physical climate risks, drawing on at least one scenario involving sharply rising emissions. The analysis is quantitative or qualitative and should reflect the current state of scientific knowledge. The assessment also covers the organisation's upstream and downstream value chains. Note: The scenarios should be based on the current IPCC scenarios (e.g. RCP 8.5). For Germany, the federal government's climate impact and risk analysis may also be used as a starting point (with optimistic *and pessimistic scenarios of climate change).* The organisation assesses the anticipated financial impacts on revenue, capital expenditure and operating costs, and the value of fixed assets resulting from significant physical risks.
	The analysis covers both slow-onset (chronic) risks and sudden (acute) risks resulting from extreme events. It should refer to the systematic classification of physical climate risks in ESRS E1.	

Climate management elements	Basic requirements for climate management	Further requirements for climate management
3.3. Binding obligations	Taking into account the results of the context analysis (section 1.1), the organisation identifies the legal obligations and other requirements relating to climate action and climate adaptation that it must or wishes to meet. It determines how these binding obligations apply to its activities, products and services and establishes the organisational, personnel and technical conditions necessary for compliance.	
4. Climate targets	The organisation must set specific, measurable, ambitious, realistic and time-bound climate targets that are consistent with top management's commitment to climate protection and climate adaptation (see Section 2.2). The climate targets must be established at the level of the organisation as a whole and broken down to relevant functional areas, sites or facilities.	
4.1. Climate protection targets		
4.1.1. GHG emission reduction targets	The organisation sets short-, medium- and long-term targets for reducing its absolute GHG emissions from Scopes 1, 2 and significant Scope 3 categories (combined or separately). The organisation should also set reduction targets for all relevant emission sources / areas of action, provided these are significant for it. The organisation may set intensity-based GHG emission reduction targets. GHG removals and the purchase of credits from voluntary climate protection projects cannot be counted towards the achievement of GHG emission reduction targets or the GHG balance (Section 3.1.2).	The organisation shall set a long-term, science-based net-zero target in accordance with the requirements of the SBTi Net-Zero Standard (Version 1.1) for a target year no later than 2050. The organisation should already set the target year as 2045.
	The organisation shall define a base year, a target year and a pathway to achieve its long-term GHG reduction target, and ensure that short- and medium-term targets serve as milestones towards achieving it. The boundaries for GHG reduction targets must be compatible with the scope of climate management and the boundaries of the GHG inventory. When setting the time horizons, the organisation should take into account its business practices, investment cycles and European and national climate targets.	The organisation defines GHG reduction targets from 2030 onwards in five-year intervals, i.e. for 2030, 2035, etc.

Climate management elements	Basic requirements for climate management	Further requirements for climate management
	The base year for the GHG reduction targets must be chosen so that it is representative of the long-term trend in GHG emissions and of the organisation itself. It may be based on an average of several years if this increases its representativeness. Where possible, a single base year should be established for different scopes and target levels within the organisation to enable comparability.	The base year must be updated every five years, starting in 2030.
4.1.2. Non-emissions-related climate protection targets	The organisation sets supporting non-emissions-related climate protection targets that are linked to the organisation's direct or indirect GHG emissions (e.g. targets for the generation, provision and supply of renewable energy or the phase-out of fossil fuels, the substitution of climate-impacting substances, materials and processes, or employee behaviour).In particular, the organisation sets targets for reducing energy consumption and increasing energy efficiency.	
4.2. Targets for addressing climate risks and opportunities	Organisations should set targets for addressing physical risks and transition risks and opportunities. Note: For example, the organisation may set a target to continually reduce the proportion of assets exposed to the impacts of climate change.	
4.3. Key performance indicators	The organisation shall establish appropriate indicators that enable: measure and monitor the effectiveness of measures in relation to climate impacts and climate risks, demonstrate progress towards achieving its climate targets.	
5. Planning of measures	The organisation must plan measures to achieve its climate targets and manage their effectiveness with regard to: significant climate impacts (3.1); significant climate risks and opportunities (3.2); the binding commitments (3.3).	If there is little scope for influence over a significant source of GHG emissions, the organisation must first endeavour to increase its influence.
	In doing so, the organisation takes into account that: all its investment and operational decisions may potentially be relevant to climate protection or climate adaptation;	The organisation assesses planned strategic, operational and investment measures for their climate impacts and incorporates these into its decision-making processes. The organisation should introduce an internal CO_2pricing system across the scope of its climate management and

Climate management elements	Basic requirements for climate management	Further requirements for climate management
	both strategic and operational measures are necessary and, in addition to incremental improvements, a fundamental transformation must be initiated where required; climate-related lock-in effects may arise, particularly in relation to investments in new facilities or infrastructure, or when entering new business areas and developing new products and services; their significant climate impacts and significant climate risks and opportunities may lie in the upstream or downstream value chain and must be addressed in collaboration with other stakeholders; in addition to measures for avoidance and mitigation, the promotion of natural GHG sinks should also be considered. Measures to reduce GHG emissions take precedence over offsetting them.	operate an internal CO_2 pricing system that supports the implementation of climate protection measures.
	The organisation ensures that the measures it plans and implements do not result in the displacement of GHG emissions to other actors and avoids negative impacts on other environmental assets, human rights or social concerns as far as possible.	
5.1. Action programmes	The organisation shall draw up a climate protection programme and a climate adaptation programme and update these on an ongoing basis. The programmes shall set out the relevant measures for achieving short-, medium- and long-term climate targets and shall serve to monitor the implementation and effectiveness of the measures.	
	In the programmes, the organisation specifies for each measure: what will be done; what outcome is sought; who is responsible; what additional resources (staff, financial resources, material resources) are required and will be provided; when the measure is to be completed; how the results will be assessed and monitored, where appropriate in conjunction with key performance indicators for progress monitoring.	

Climate management elements	Basic requirements for climate management	Further requirements for climate management
5.1.1. Climate Protection Programme	In the climate protection programme, the organisation should also specify which significant GHG emission sources or other climate impacts the measures relate to; what expected quantitative or qualitative contribution measures will make towards achieving the climate targets and when; where applicable, what contribution measures make to mitigating its transition risks or to capitalising on its climate opportunities; at what level of the organisation the measures will take effect (e.g. organisation-wide, site-wide, facility- or process-specific); what expected contribution the measures will make to increasing their adaptability or mitigating their physical climate risks, and when; what displacement effects and undesirable side effects the measures could give rise to.	
	The organisation can structure its climate action programme by areas of action, e.g. 'Products and Services', 'Procurement and Raw Materials', 'Manufacturing Processes', 'Fuels and Energy', 'Building Operations' and 'Mobility', or by economic activities in accordance with the EU Taxonomy Regulation, for the purposes of better planning and operationalisation.	
5.1.2. Climate adaptation programme	In the climate adaptation programme, the organisation should also specify which significant physical climate risks the measures address; what expected quantitative or qualitative contribution the measures will make to improving resilience or mitigating physical climate risks, and when; to what extent insurance against residual risks is necessary; at which level of the organisation the measures will take effect (e.g. organisation-wide, site-wide, facility- or process-specific).	
5.2. Climate protection projects	If the organisation decides to voluntarily finance climate protection projects using carbon credits, it shall – as far as possible – ensure that	

Climate management elements	Basic requirements for climate management	Further requirements for climate management
	the emission reduction or GHG removal from the relevant climate protection projects: is additional, i.e. would not occur without the project; does not result in higher emissions elsewhere or cause an unreasonable detriment to other legal interests; is guaranteed to be permanent (particularly in the case of biogenic sink projects/carbon removals); contributes to sustainable development in the project region beyond climate protection; is not already being used by other organisations for voluntary offsetting or by states to fulfil national or international climate protection obligations (avoidance of double counting); is verified by independent experts with regard to the application of generally accepted standards.	
6. Communication	The organisation must establish and implement processes to exchange relevant information for managing its significant climate impacts, significant climate risks and opportunities, as well as binding commitments, between the various levels and areas of responsibility and the respective responsible persons. The organisation must introduce and implement processes for regularly and ad hoc informing senior management about climate-related issues and developments.	
6.1. Internal communication	The organisation must establish and implement processes to exchange relevant information for the management of its significant climate impacts, significant climate risks and opportunities, and binding commitments between the various levels and functional areas and the respective responsible persons. The organisation must introduce and implement processes for regularly and ad hoc informing top management about climate-related issues and developments.	
6.2. Climate reporting	The organisation shall publish meaningful information on its climate management annually, which is easily accessible to interested parties and the public on the internet. This includes: Information on the organisation's business model and its strategy;	The organisation publishes a climate report that complies with the requirements of ESRS E1.

Climate management elements	Basic requirements for climate management	Further requirements for climate management
	Information on significant short-, medium- and long-term climate risks and opportunities and their impact on the business model and strategy; Information on how significant climate risks and opportunities are addressed, including the governance structure and the role of senior management, as well as the risk management process; Senior management's commitment to climate action and climate adaptation; the GHG balance sheet, significant climate impacts and quantitative information on GHG removals and storage, including qualitative information on the associated projects; Climate targets, including short-, medium- and long-term GHG emission reduction targets and the extent to which they have been achieved, as well as the planned measures relevant to achieving the climate targets; in the case of voluntary financing of climate protection projects outside the value chain through carbon credits: the underlying climate protection projects with further information (location, project type, duration, size or reduced quantity) and quality standards of the credits.	
	The information should be integrated into the organisation's existing reporting formats, e.g. an environmental or sustainability report, management report or an EMAS environmental statement.	
7. Operational planning and management	The organisation must have processes in place to manage its significant climate impacts, significant climate risks and opportunities, and binding commitments. It must implement the established processes and monitor planned and unplanned changes. Note: The organisation should assess the extent to which it can adapt existing processes and policies and where new processes need to be established.	
	The organisation shall establish climate change mitigation and/or adaptation-related criteria for: product and service development, taking into account its value chain; procurement and supply chain management;	

Climate management elements	Basic requirements for climate management	Further requirements for climate management
	risk management; the operation of its buildings, facilities and other infrastructure; the transport of people, goods and materials, at least for the vehicle fleet, employees' business travel and delivery traffic; emergency preparedness and risk mitigation, particularly with regard to significant physical climate risks and taking into account their value chain.	
8. Review, evaluation and improvement	The organisation reviews and evaluates its climate management and continually improves it, taking into account changing external and internal conditions.[13]	
8.1. Review of climate management	The organisation shall review and evaluate on an ongoing basis, at least annually: the achievement of its climate objectives and the adequacy of the measures taken to achieve them; its climate risks and opportunities, as well as the adequacy of climate measures to address these risks and opportunities; the effectiveness of its processes for managing its significant climate impacts, risks and opportunities; compliance with its legal obligations and other requirements (binding obligations).	In addition, the organisation reviews and assesses the degree of implementation of the transformation plan as part of its internal audit.
8.2. Management review	At least once a year, the organisation's top management evaluates the suitability, adequacy and effectiveness of climate management in relation to climate targets, the adequacy of the financial, human and technical resources made available, and the integration of climate management into the organisation's structures, strategies, objectives, financial planning and processes.	The organisation's top management shall also assess at least once a year: the degree of implementation of the transformation plan; and the adequacy of its plans and measures to improve resilience to significant climate risks.
8.3. Improvement	If non-conformities or opportunities for improvement are identified through the monitoring and evaluation of climate management in accordance with 8.1 and 8.2, the organisation shall initiate the necessary corrections and adjustments.	

Climate management elements	Basic requirements for climate management	Further requirements for climate management
	The organisation shall demonstrate continual improvement in climate management.	