

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Merck is a global science and technology company headquartered in Darmstadt, Germany. Our business comprises three business sectors: Healthcare, Life Science, and Electronics (previously: Performance Materials).

In Life Science, we are a leading global provider of tools, chemicals, and equipment to academic labs, biotech and pharmaceutical manufacturers, and the industrial sector. With a strong focus on innovation, we are committed to delivering the products, services, and digital platforms to create a sustainable future for generations to come. In early 2022, we announced the reorganization of the sector to support Life Science's long-term growth strategy and to better serve our global customers' evolving needs. The existing Contract Development and Manufacturing Organization and Contract Testing services were split from the Process Solutions business. The Process Solutions business will continue its focus on delivering our leading product offering for pharmaceutical development and manufacturing, including filtration devices, chromatography resins, single-use assemblies and systems, processing chemicals, and excipients. The Research Solutions and Applied Solutions business units were combined into one organization called Science and Lab Solutions. This business unit serves the pharma and biotech, industrial and testing, academic and government, and diagnostics sectors, providing customers a more seamless experience and access to a broad portfolio including reagents, consumables, devices, instruments, software, and services for scientific discovery, in addition to lab water instruments, consumables and services, microbiology and biomonitoring products, test assays, analytical reagents, and flow cytometry kits and instruments.

Our Healthcare business sector discovers, develops, manufactures, and markets innovative pharmaceutical and biological prescription drugs to treat cancer, multiple sclerosis (MS), infertility, growth disorders, and certain cardiovascular and metabolic diseases. Healthcare operates across four therapeutic areas with a clear ambition to become a global specialty innovator: Neurology and Immunology, Oncology, Fertility, and Cardiology Metabolism & Endocrinology. Our R&D pipeline positions us with a clear focus on strengthening our leadership positions in oncology, neurology, and immunology. During the Covid-19 pandemic, we have been continuously making every effort to proactively handle the situation and minimize the impact of the pandemic and also of any challenges from the external context on the supply of our medicines locally and globally. To this end, we are using three main levers: the thorough implementation and further development of our business continuity plans across our network, the active management of our stocks, and the assessment of alternative transportation routes to reach our customers and patients.

With our Electronics business sector our main focus is on materials and solutions for the electronics market. We realigned our portfolio toward the accelerated digitization and the growth of data. This drives the need for more and higher sophisticated semiconductor chips and displays. Today, we are optimally positioned to leverage our key strengths: With a well-balanced and broad technology portfolio of materials and equipment, industry leading R&D and a global production network close to our customers, we have become one of the most relevant suppliers of materials and solutions for the semiconductor and display industries – and are on track to further expand our position. In addition, our decorative and functional solutions for innovative surfaces of all kinds make life more colorful. The business sector consists of three business units: Semiconductor Solutions, Display Solutions, and Surface Solutions.

Apart from our three business sectors, our financial reporting presents five regions: Europe, North America, Asia-Pacific, Latin America, the Middle East and Africa. As of December 31, 2022, we had 64,243 employees worldwide. The figure as of December 31, 2021, was 60,348 employees. In 2022, our 224 fully consolidated companies with personnel in 66 countries generated sales of € 22.2 billion. Our 101 production sites are located across 19 countries.

We are embedding the topic of sustainability into our Group strategy as an essential component. In 2020, we formulated new, strategic sustainability goals. Through our business activities, we want to be economically successful, while at the same time creating value for society. Becoming climate neutral along our entire value chain by 2040 is one of the three overarching goals we have set ourselves. In May 2022, the independent Science Based Targets initiative (SBTi) has confirmed that our near-term goals for 2030 correspond to the current status of climate science. Consequently, Merck is helping to limit global warming to 1.5°C, thus meeting the requirements of the Paris Agreement.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data and indicate whether you will be providing emissions data for past reporting years.

Reporting year

Start date

January 1 2022

End date

December 31 2022

Indicate if you are providing emissions data for past reporting years

No

Select the number of past reporting years you will be providing Scope 1 emissions data for

<Not Applicable>

Select the number of past reporting years you will be providing Scope 2 emissions data for

<Not Applicable>

Select the number of past reporting years you will be providing Scope 3 emissions data for

<Not Applicable>

C0.3

(C0.3) Select the countries/areas in which you operate.

- China
- France
- Germany
- Ireland
- Israel
- Italy
- Japan
- Republic of Korea
- Taiwan, China
- United States of America

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

EUR

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Operational control

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	DE000659905

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual or committee	Responsibilities for climate-related issues
Chief Executive Officer (CEO)	Description of the position and relation to climate issues: The CEO of Merck has the overarching responsibility for climate-related issues as part of the CEO's wider responsibility for Merck's overall sustainability strategy. In this role, the CEO takes care of the development of climate protection targets, monitoring of target performance, promoting measures towards target achievement etc. Within their respective area of responsibility, each Executive Board member is also responsible for sustainability, reviews the priorities that have been set, and decides on the implementation of initiatives. The head of Merck's Corporate Sustainability, Quality & Trade Compliance unit (SQ), which has oversight for all climate-related activities at Merck, reports directly to the CEO. SQ also heads the Merck Sustainability Board that consists of representatives from our business sectors and from key Group functions, such as Procurement, Communications, as well as Controlling and Risk Management. The Merck Sustainability Board steers and monitors the Group-wide implementation of the sustainability strategy. It aligns the strategy with the individual business strategies, defines priorities and specifies globally applicable sustainability guidelines. In addition, the Merck Sustainability Board ensures that the initiatives of our various business sectors, Group functions and subsidiaries align with our global sustainability strategy. Moreover, it recommends corresponding initiatives to the Executive Board. The council is sponsored by the CEO and another member of Merck's Executive Board. Outcomes of the quarterly meetings are reported to the whole Board. Example for a climate-related decision in 2022: Merck's Board decided to expand our renewable energy commitment in the US through another VPPA (Liberty County Solar project, 40 MW) with a 16-year term.
Chief Financial Officer (CFO)	Description of the position and relation to climate issues: Merck's CFO is responsible for dedicated climate-related issues. Examples are sustainability in our investment processes, management incentives or interlinking sustainability and financial reporting. Examples of climate-related decisions 2021: As head of the CFO area, the CFO triggered projects to develop a framework to consider GHG emissions in Merck's investment processes which also includes a carbon pricing approach. Furthermore, a Sustainability Factor was developed oriented at our sustainability goals that will be included in the long-term incentive plan of the senior management in 2022 (see Long-Term Incentive Plan (LTIP) - Merck Annual Report 2021 (merckgroup.com). GHG emissions are an important part of this factor.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – some meetings	Overseeing and guiding employee incentives Reviewing and guiding strategy Overseeing and guiding scenario analysis Overseeing the setting of corporate targets Monitoring progress towards corporate targets Overseeing and guiding public policy engagement Reviewing and guiding the risk management process	<Not Applicable>	The CEO of Merck has the overarching responsibility for climate-related issues as part of the CEO's wider responsibility for Merck's overall sustainability strategy. In this role, the CEO takes care of the development of climate protection targets, monitoring of target performance, promoting measures towards target achievement etc. Overall Board oversight over climate-related issues is safeguarded via different channels. for instance: - The head of Merck's Corporate Sustainability, Quality & Trade Compliance unit (SQ), represents the highest responsibility for the overall governance for climate-related issues below Merck's Executive Board (= delegation of governance from Board). SQ coordinates and steers activities to implement Merck's climate protection program to reach Merck's climate targets 2030 and 2040. SQ monitors GHG emissions regularly using a central IT platform and monitors the implementation of energy efficiency and GHG reduction projects. The head of SQ reports directly to the CEO and informs the whole Board regularly on the current state and next steps of our climate protection program. In case, action on climate protection by the Board is needed, top management decisions, such as corporate environmental goal setting, are prepared. - The head of Merck's Corporate Sustainability, Quality & Trade Compliance unit (SQ) also heads the Merck Sustainability Board that consists of representatives from our business sectors and from key Group functions, such as Procurement, Communications, as well as Controlling and Risk Management. It aligns the strategy with the individual business strategies, defines priorities and specifies globally applicable sustainability guidelines. In addition, the Merck Sustainability Board ensures that the initiatives of our various business sectors, Group functions and subsidiaries align with our global sustainability strategy. Moreover, it recommends corresponding initiatives to the Executive Board. The council is sponsored by the CEO and another member of Merck's Executive Board. Outcomes of the quarterly meetings are reported to the whole Board. - In the context of Merck's risk management, Group Controlling & Risk Management informs the Board twice a year about the aggregated opportunity/risk exposure of Merck, including climate-related risks. - Decisions by the Board on major, long-term renewable electricity agreements such as Virtual Power Purchase Agreements.

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	As climate change and its impacts are in the focus of many different stakeholders like investors, customers, politics etc. and are discussed in high-level groups, each Executive Board member needs competence on climate-related issues. Internally, sustainability topics and climate-related issues are discussed on a regular basis within Merck's Board. In the past years many decisions with regard to these topics have been taken by the Board as a whole and by single Board members. Examples are: - Sustainability Strategy - Climate goals and decision to go for science-based targets - Renewable electricity procurement - Reduction of process-related GHG emissions - Integration of sustainability in investment process/internal carbon price - Integration of climate goals in the long-term incentive plan of the senior management Based on all this, each Board member gained knowledge and competence on climate-related issues.	<Not Applicable>	<Not Applicable>

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Position or committee

Sustainability committee

Climate-related responsibilities of this position

Integrating climate-related issues into the strategy

Conducting climate-related scenario analysis

Setting climate-related corporate targets

Monitoring progress against climate-related corporate targets

Assessing climate-related risks and opportunities

Coverage of responsibilities

<Not Applicable>

Reporting line

CEO reporting line

Frequency of reporting to the board on climate-related issues via this reporting line

Quarterly

Please explain

The Merck Sustainability Board which is headed by the head (President) of Corporate Sustainability, Quality & Trade Compliance unit (SQ), consists of representatives from our business sectors and from key Group functions, such as Procurement, Communications, as well as Controlling and Risk Management. Members from Europe, the United States and Asia provide input on regional sustainability aspects.

The Merck Sustainability Board steers and monitors the Group-wide implementation of the sustainability strategy. It aligns the strategy with the individual business strategies, defines priorities and specifies globally applicable sustainability guidelines. In addition, the Merck Sustainability Board ensures that the initiatives of our various business sectors, Group functions and subsidiaries align with our global sustainability strategy. Moreover, it recommends corresponding initiatives to the Executive Board. In 2022, the Merck Sustainability Board met nine times by video conference. The participants addressed the following topics: Implementing the sustainability strategy in the business sectors, key indicators for measuring and steering sustainability within the company, lowering greenhouse gas emissions, and supply chain due diligence requirements.

The measures adopted by the Merck Sustainability Board are implemented by our line managers as well as by interdisciplinary project teams. To achieve our operational sustainability goals and depending on the topic, responsibility is assigned to specific teams, functions and business units. Those responsible for implementation exchange ideas and coordinate actions in an overarching committee. They identify synergies between the projects and tailor their direction to our sustainability goals.

Position or committee

Chief Sustainability Officer (CSO)

Climate-related responsibilities of this position

Integrating climate-related issues into the strategy

Conducting climate-related scenario analysis

Setting climate-related corporate targets

Monitoring progress against climate-related corporate targets

Assessing climate-related risks and opportunities

Coverage of responsibilities

<Not Applicable>

Reporting line

CEO reporting line

Frequency of reporting to the board on climate-related issues via this reporting line

Quarterly

Please explain

The head (President) of Corporate Sustainability, Quality & Trade Compliance unit (SQ), represents the highest responsibility for the overall governance for climate-related issues below Merck's Executive Board (= delegation of governance from Board). SQ coordinates and steers activities to implement Merck's climate protection program to reach Merck's climate targets 2030 and 2040. SQ monitors GHG emissions regularly using a central IT platform and monitors the implementation of energy efficiency and GHG reduction projects. The head of SQ reports directly to the CEO and informs the whole Board regularly on the current state and next steps of our climate protection program. In case, action on climate protection by the Board is needed, top management decisions, such as corporate environmental goal setting, are prepared.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	Incentives for management of climate-related issues are managed on various levels.

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive

Board/Executive board

Type of incentive

Monetary reward

Incentive(s)

Bonus - % of salary

Performance indicator(s)

Progress towards a climate-related target

Incentive plan(s) this incentive is linked to

Long-Term Incentive Plan

Further details of incentive(s)

Merck added a sustainability factor to the Merck Long-Term Incentive Plan (LTIP) in 2022. The Long-Term Incentive Plan is based on a four-year future-oriented performance cycle that is composed of a three-year target achievement cycle and, since the 2021 tranche, a subsequent one-year holding period. As of fiscal year 2022, sustainability targets are taken into consideration by supplementing the LTIP by a sustainability factor in addition to three financial performance indicators. The sustainability factor has a range of 0.8 to 1.2 and can increase or reduce the target achievement resulting from the financial key performance indicators by up to 20%. One of the three pillars of Merck's strategic sustainability goals is 'Reducing our ecological footprint'. Here, the reduction of greenhouse gas emissions (scope 1 & 2) is one element.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

Incentives on Board level on the progress towards our scope 1&2 company targets are key elements in our overall sustainability strategy as this will impact Merck's overall organization (e.g., there are GHG reduction targets on various levels). By this, these incentives will help to reach our SBTi approved 1.5°C near-term goals for 2030.

Entitled to incentive

Environmental, health, and safety manager

Type of incentive

Monetary reward

Incentive(s)

Bonus - % of salary

Performance indicator(s)

Implementation of an emissions reduction initiative
Reduction in absolute emissions
Energy efficiency improvement
Reduction in total energy consumption

Incentive plan(s) this incentive is linked to

Long-Term Incentive Plan

Further details of incentive(s)

Environment/Sustainability managers in various positions within Merck receive monetary incentives related to climate protection and energy saving/efficiency activities.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

Incentives on the implementation of energy efficiency/saving or other GHG reduction projects will contribute to the achieving of our GHG company goals. Besides this, awareness on climate action is risen.

Entitled to incentive

Energy manager

Type of incentive

Monetary reward

Incentive(s)

Bonus - % of salary

Performance indicator(s)

Energy efficiency improvement
Reduction in total energy consumption

Incentive plan(s) this incentive is linked to

Long-Term Incentive Plan

Further details of incentive(s)

Energy managers receive financial incentives with regard to climate protection and energy saving/efficiency (e.g., for detecting energy saving potentials or implementing energy saving projects).

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

Incentives on the implementation of energy efficiency/saving projects will contribute to the achieving of our GHG company goals. Besides this, awareness on climate action is risen.

Entitled to incentive

Facilities manager

Type of incentive

Monetary reward

Incentive(s)

Bonus - % of salary

Performance indicator(s)

Energy efficiency improvement
Reduction in total energy consumption

Incentive plan(s) this incentive is linked to

Long-Term Incentive Plan

Further details of incentive(s)

Facility managers receive financial incentives with regard to climate protection and energy saving/efficiency (e.g., for detecting energy saving potentials or implementing energy saving projects).

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

Incentives on the implementation of energy efficiency/saving projects will contribute to the achieving of our GHG company goals. Besides this, awareness on climate action is risen.

Entitled to incentive

Process operation manager

Type of incentive

Monetary reward

Incentive(s)

Bonus - % of salary

Performance indicator(s)

Implementation of an emissions reduction initiative

Reduction in absolute emissions

Energy efficiency improvement

Reduction in total energy consumption

Incentive plan(s) this incentive is linked to

Long-Term Incentive Plan

Further details of incentive(s)

Process operations managers receive financial incentives with regard to climate protection and energy saving/efficiency (e.g., for detecting energy saving potentials or implementing energy saving projects or reduction projects for process-related emissions).

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

Incentives on the implementation of energy efficiency/saving or other GHG reduction projects will contribute to the achieving of our GHG company goals. Besides this, awareness on climate action is risen.

Entitled to incentive

All employees

Type of incentive

Monetary reward

Incentive(s)

Bonus - % of salary

Bonus – set figure

Performance indicator(s)

Reduction in absolute emissions

Energy efficiency improvement

Reduction in total energy consumption

Incentive plan(s) this incentive is linked to

Long-Term Incentive Plan

Further details of incentive(s)

Based on Merck's overall long-term incentive plan each employee is encouraged to support this target. For instance, at our largest manufacturing sites Darmstadt/Gernsheim, representing 24% of our Groupwide total energy consumption, an employee suggestion scheme financially rewards good ideas on energy efficiency and emission reduction. In our three business sectors, we recognize projects who contribute to Environment, Health & Safety excellence. Projects on climate-related issues are an important part of this.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

Incentives on the provision of ideas to reduce our energy consumption and greenhouse gas emissions will help to generate reduction projects which contribute to the achieving of our GHG company goals. Besides this, awareness on climate action is risen.

Entitled to incentive

Procurement manager

Type of incentive

Monetary reward

Incentive(s)

Bonus - % of salary

Performance indicator(s)

Increased share of renewable energy in total energy consumption

Increased engagement with suppliers on climate-related issues

Increased value chain visibility (traceability, mapping, transparency)

Incentive plan(s) this incentive is linked to

Long-Term Incentive Plan

Further details of incentive(s)

Various procurement managers receive financial incentives for setting up and driving Merck's Supplier Decarbonization Program as well as for driving Merck's renewable electricity procurement strategy incl. renewable electricity purchase.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

Scope 3, category 1 and 2 emissions (purchased goods, capital goods) contribute with approx. 55% to Merck's total company carbon footprint. Incentives on programmes to decarbonize our suppliers will contribute to the achieving of our GHG company goals. The same applies for incentives on the purchase of renewable electricity as this is the main lever to reduce our Scope 2 emissions.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?
Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	2	Short-term horizon in line with group risk management processes.
Medium-term	2	5	Mid-term horizon in line with group risk management processes. For standard risk reporting, we're focusing on the current and the following four calendar years. Risks have to be reported with impact and likelihood in yearly time-slices for each calendar year.
Long-term	5	20	In order to get an understanding of the long-term risk profile, relevant risks should be identified and described qualitatively (and where possible also quantitatively). Based on that, a risk map with relevant trends and threats is developed and monitored. In line with Merck's updated sustainability strategy, in relevant cases, a longer risk horizon shall be applied, e.g., up to 20 years or more with respect to the objective to achieve climate neutrality until 2040. In relation to climate- related scenarios, also risks beyond this could be taken into consideration.

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

The significance of a risk is determined based on its probability to cause potential unfavorable deviations from our financial and non-financial targets. We provide a solid basis to evaluate risks from quantitative and/or qualitative point of view, whereby two separate but aligned matrices are used.

The **quantitative** risk matrix shows the individual risks and their significance to the Group. Risks are clustered based on their maximum impact and probability in any year.

Degree of impact:

- > € 500 million - Critical negative impact on the net asset, financial position, and results of operations
- € 100 – 500 million - Significant negative impact on the net asset, financial position, and results of operations
- € 25 – 100 million - Moderate negative impact on the net asset, financial position, and results of operations
- € 10 – 25 million - Minor negative impact on the net asset, financial position, and results of operations
- < € 10 million - Immaterial negative impact on the net asset, financial position, and results of operations

Probability of occurrence:

- < 1% - Highly improbable
- 1 – 5% - Improbable
- 5 – 20% - Possible
- 20 – 50% - Likely
- > 50% - More than likely

The combination of impact and likelihood in a 5x5 risk matrix visualizes the potential severity of a single risk. Following cluster relations lead to **substantial/significant risk** evaluation:

- a. € 25–100 million & > (20-50%)
- b. € 100–500 million & > (5 – 20%)
- c. > € 500 million & all probability clusters (>0%)

For non-financial risks (such as reputation, Environmental, Social, Governance (ESG)), we introduced a **qualitative** rating scale as a reference for comprehensive assessment. The evaluation range is from low to critical.

All substantial, critical (and selected moderate) topics are regularly presented to respective management and committees.

The definition for substantive financial or strategic impact is outlined in our group-wide risk management guidelines.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

More than once a year

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

IDENTIFY

Company level: The timeframe applied for internal risk reporting is five years. Nevertheless, potential longer-term climate-related risks are evaluated by the businesses and Group functions., e.g., for regulatory risks related to climate change. By this, it covers short-, medium- and long-term time horizons.

The business heads, managing directors of Merck subsidiaries, and the heads of Group functions are specified as employees with responsibility for risks. The risk owners assess their risks more than once a year (every six months) and report their risk portfolio to Risk Management. Besides, risks have to be reported on an ad hoc basis when they arise and meet certain thresholds. For regular reporting, all risks above a € 10 million thresholds have to be reported (net impact). Risks below these thresholds are steered independently within the business sectors or on local level.

As a Group function Corporate Sustainability, Quality & Trade Compliance (SQ) is integrated in the risk management process. SQ regularly assesses environmental incl. climate-related risks to our operation units and business. We monitor regulatory risks in connection with the transition to a low-carbon economy, which could materialize in the mid- and long-term through rising carbon prices through emissions trading systems, taxes or energy legislation. We mitigate those risks with our energy and carbon management measures. We classify these as possible risks based on which a substantial impact on the financial position cannot be ruled out. Long-term risks are also discussed in the group-wide Merck Sustainability Board. Our group-wide Business Continuity Management is a further component to assess risks and ensure the uninterrupted availability of all key business and mission-critical business activities. Hereby, long-term risks such as climate-related risks are covered as well. Within Business Continuity Management the whole up- and downstream value chain as well as direct operations are considered.

As part of their daily work and as an integral part of their ISO 14001 and ISO 50001 certification our site EHS and Facility Management evaluate climate-related risks. Hereby, the direct impact on the sites is assessed as well as the up- and downstream value chain. Regulatory and other risks are considered as well as opportunities. As the site EHS Management reports directly via dotted line to the Group function Corporate Sustainability, Quality & Trade Compliance it is safeguarded that all relevant risks throughout the Merck Group are known, can be further assessed, and passed on to the group-wide risk management.

Group Controlling & Risk Management reports directly to the Group Chief Financial Officer and uses the information reported to determine the current risk portfolio for the Merck Group, presenting this in a report to the Executive Board and relevant committees with detailed explanations twice per year.

Opportunities arising from further integration of sustainability in the corporate strategy: In 2020, we integrated sustainability more strongly in the corporate strategy, setting three goals in the areas of science and technology, value chain, and climate and environment. By considering the goals of the sustainability strategy when making business decisions and actively shifting our portfolio to increase the positive sustainability impact, we contribute to achieving the United Nations Sustainable Development Goals. With an expected positive impact on our revenues we can capitalize on these opportunities. In 2022, we extended the targeted strategies for our business sectors. Also, we launched a sustainability scorecard for our research and development activities. We conducted a project on qualitative climate-related scenario analyses to integrate the results into our risk management and to safeguard compliance with TCFD-aligned requirements. Hereby, climate-related risks and opportunities (physical/transitional) have been covered. Quantitative scenario analyses are currently being conducted (2023).

ASSESS

Risks are assessed based on our group-wide risk management guidelines. The quantitative risk matrix shows the individual risks and their significance to the Group. Risks are clustered based on their most likely impact and probability in any year. For non-financial risks (such as reputation, Environmental, Social, Governance), we introduced a qualitative rating scale as a reference for comprehensive assessment. The evaluation range is from low to critical.

Likewise, risk-mitigating measures are reported and assessed. These are key for an appropriate management of the risks and are steps to either transfer risks or to reduce impact and/or probability. For relevant risks (and according to the respective reporting thresholds and levels), mitigations have to be evaluated. The description should contain an outline of planned or conducted activities with responsibilities, applicable deadlines (expected implementation date), costs and a mitigation effect on either impact or probability. The calculation of anticipated effects and underlying assumptions shall be stated and explained.

RESPOND

All actions must be classified by its implementation status: planned, initiated or implemented. The requirement to report mitigation measures applies to all reported risks. The effectiveness of these measures and the planned implementation time frame are monitored by the risk owner/champion and Group Risk Management. Mitigation measures are divided into: risk reduction, provision (where appropriate), transfer (in case insurance coverage is given), acceptance (only in rare cases). It's up to the respective risk owners to draw individual conclusions on risk situation and to take appropriate risk-based decisions. Especially in relation to risk measures, risk managers decide on further risk treatment strategies, keeping cost-benefit ratios in mind. Up to pre-defined thresholds it's in full responsibility of the respective unit to manage the risks and opportunities. On group level, risk management monitors closely overall risk exposures and leading risk KPIs "risk capacity" and "risk tolerance".

Example TRANSITIONAL RISK:

Situation: The manager responsible for reporting obligations in the UK identified the risk from being non-compliant with new TCFD-aligned reporting requirements and contacted the Group function Corporate Sustainability, Quality & Trade Compliance).

Task: The reporting requirements in the UK have been evaluated. At the same time similar reporting requirements (e.g., from EU Taxonomy) have been evaluated and merged to have a full picture on TCFD-aligned reporting requirements.

Action: The requirements evaluated have been integrated into a planned project on climate-related scenario analyses.

Result: In 2022, we conducted a project on qualitative climate-related scenario analyses to integrate the results into our risk management and to safeguard compliance with TCFD-aligned requirements.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	We consider current regulation (e.g., on Emissions Trading Scheme (ETS)) as relevant in our climate-related risk assessments because compliance with climate-related and other regulations is key for our license to operate. Besides, any new or changed regulation impacts our operational costs. This applies mainly for the impact of cap and trade schemes like the EU ETS. With power plants at the Darmstadt and Gernsheim sites in Germany, Merck is covered by the EU Emission Trading Scheme (EU ETS) directly. Globally, the number of ETs in operation increased to 28, the share of global emissions covered by an ETS increased from 8% to 17% (EMISSIONS TRADING WORLDWIDE, Status Report 2023, ICAP). This affects Merck that has subsidiaries in more than 66 countries by increased operational costs. Generally, risks from regulations are monitored at various levels in our company. For instance, our Group function Corporate Sustainability, Quality & Trade Compliance (SQ) is integrated in the risk management process. We monitor regulatory risks in connection with the transition to a low-carbon economy, which could materialize in the mid- and long-term through rising carbon prices through emissions trading systems, taxes or energy legislation. In 2022, we conducted a project on qualitative climate-related scenario analyses to integrate the results into our risk management and to safeguard compliance with TCFD-aligned requirements. Hereby, climate-related risks and opportunities (physical/transitional) have been covered. Quantitative scenario analyses are currently being conducted (2023) with support from external consultants which will cover approx. 100 Merck sites worldwide. Example: Merck considers the risk from current regulation, e.g., the impact of cap and trade schemes like the EU Emissions Trading Scheme (ETS). With power plants at the Darmstadt and Gernsheim sites in Germany, Merck is covered by the EU Emission Trading Scheme (EU ETS). These two sites are responsible for approx. 24% of Merck's overall energy consumption. In the framework of the European Green Deal, the EU started to revise key legislation. Among them the EU ETS. This poses a risk to Merck as the regulator aims for much higher certificate prices in order to effectively realize steering of energy generation according to climate requirements. By this, the EU ETS impacts Merck directly through our own energy generation facilities participating in the EU ETS and indirectly, through our supply chain.
Emerging regulation	Relevant, always included	We consider emerging regulation (e.g., on Emissions Trading Scheme (ETS) or on reporting requirements) as relevant in our climate-related risk assessments because compliance with climate-related and other regulations is key for our license to operate. Besides, any new or changed regulation impacts our operational costs. This applies, for instance, for the impact of cap and trade schemes like the EU ETS. With power plants at the Darmstadt and Gernsheim sites in Germany, Merck is covered by the EU Emission Trading Scheme (EU ETS) directly. Globally, the number of ETs in operation increased to 28 and the share of global emissions covered by an ETS increased from 8% to 17%. 20 more systems are under development or consideration across the world (EMISSIONS TRADING WORLDWIDE, Status Report 2023, ICAP). This affects or will affect Merck that has subsidiaries in more than 66 countries and 101 manufacturing sites in 19 countries. Generally, risks from regulations are monitored at various levels in our company. For instance, our Group function Corporate Sustainability, Quality & Trade Compliance (SQ) is integrated in the risk management process. We monitor regulatory risks in connection with the transition to a low-carbon economy, which could materialize in the mid- and long-term through rising carbon prices through emissions trading systems, taxes or energy legislation. In 2022, we conducted a project on qualitative climate-related scenario analyses to integrate the results into our risk management and to safeguard compliance with TCFD-aligned requirements. Hereby, climate-related risks and opportunities (physical/transitional) have been covered. Quantitative scenario analyses are currently being conducted (2023) with support from external consultants which will cover approx. 100 Merck sites worldwide. Examples: On 5 January 2023 the EU Corporate Sustainability Reporting Directive (CSRD) entered into force. This new directive strengthens the rules about the social and environmental information that companies have to report. Merck has to apply the new rules for the first time in financial year 2024, for reports published in 2025. In the framework of the European Green Deal, the EU started to revise key legislation like the Renewable Energy Directive, the Energy Efficiency Directive or the Emissions Trading System. Merck is impacted by this and must closely monitor the development to mitigate any litigation risks.
Technology	Relevant, sometimes included	We consider technology as relevant in our climate-related risk assessments because technology could potentially have an impact on Merck's competitiveness via an increase of operational costs or via an insecure energy supply. To tackle climate change there is the need to transition to lower emissions technologies. For Merck this means primarily to actively push for a secure, low or zero carbon energy supply. Within the scope of Merck's climate protection goals to reduce greenhouse gas emissions, one of the measures is the installation of low or zero carbon technologies to generate energy (e.g., photovoltaic plants, heat pumps). Here we see the risks that investments might be unsuccessful because of changing framework conditions (e.g., unexpected increases in the costs of energy; acknowledgement of bio energy) and that alternative technologies might be much more costly than standard technologies. To avoid adverse effects, possible risks are evaluated and mitigated, for instance within Merck's investment process that requires various control steps. Besides this, we are actively mitigating this risk by sourcing electricity from renewable sources, by installing 'green' on-site technology (e.g., electrification), and by scouting and partnering with technology providers for new low or zero carbon technology. Example: For instance, at Merck's largest site, Darmstadt, we operate a large gas power plant to generate electricity, heat and steam. The plant underlies the EU ETS. Replacing this by a low or zero carbon technology will bear huge risks and uncertainties. The site invests into on-site renewable energy (e.g., photovoltaics, heat pumps) which supports the transition to a low/zero carbon energy supply but still there will be challenges to cover the total energy demand of the site. Therefore, the energy strategy of the Darmstadt site is currently being further developed in order to align the energy supply even more closely with Merck's climate protection goals and to adapt it to the overall changing framework conditions.
Legal	Relevant, always included	We consider legal risks as relevant in our climate-related risk assessments because compliance with climate-related and other regulations is key for our license to operate. Failure and resulting litigation bear a risk to Merck's business. Risks from regulations are monitored at various levels in our company. For instance, our Group function Corporate Sustainability, Quality & Trade Compliance (SQ) is integrated in the risk management process. SQ regularly assesses environmental incl. climate-related risks to our operation units and business. We monitor regulatory risks in connection with the transition to a low-carbon economy, which could materialize in the mid- and long-term through rising carbon prices through emissions trading systems, taxes or energy legislation. As part of their daily work and as an integral part of their ISO 14001 and ISO 50001 certification our site EHS and Facility Management evaluate climate-related risks. Hereby, the direct impact on the sites is assessed as well as the up- and downstream value chain. Potential risks are reported based on our established risk management processes. Example: Based on the Paris Agreement and the need to tackle climate change we see an increasing regulatory pressure on a national, an EU and an international level. Merck is impacted by this and must closely monitor the development to mitigate any litigation risks. This applies for more than 60 countries where Merck is active. At this time, we do not see an increasing legal risk in future as legal monitoring is integrated in our risk and business processes. No litigations are pending to date.
Market	Relevant, always included	We consider market developments as relevant in our climate-related risk assessments because they might impact both, our upstream as well as our downstream value chain. Merck monitors various market risks regarding our upstream supply chain, e.g., an interruption of supply due to extreme weather events, longer delivery times because of the shift from air to sea transportation, higher costs because of stricter climate-related regulations imposed on our supplier (e.g., emission trading schemes). Currently, there is no indication that risks due to climate change-related weather extremes increase relevantly at supplier sites. Due to the product portfolio of our three business sectors Life Science, Healthcare and Electronics, we do not see any risks from climate change in Merck's downstream supply chain for the upcoming years. There are no critical products where we expect decreasing sales quantities because of changing customer behaviour due to climate change. We rather see opportunities for some of our products (e.g., to fight Malaria or to improve energy efficiency in the display sector). Besides this, reputational risks could potentially affect the demand for our products or our access to capital. Reputational risks are managed on various levels. For instance, our Group functions Corporate Sustainability and Investor Relations as well as the businesses are in close contact with customers, investors, rating agencies etc. Example: Merck considers potential risks arising from climate-related reputation which could potentially affect the demand for our products or our access to capital. Worldwide, investors, customers, NGOs and the public are increasingly focusing on how companies are dealing with sustainability issues such as climate change and how they are integrating these topics into their business strategies and communication. Currently, we do not see increasing climate-related reputation risks for Merck. For instance, since September 2008, our company is listed in the FTSE4Good Index, an important sustainability index that assesses the social, ecological and ethical conduct of companies.

	Relevance & inclusion	Please explain
Reputation	Relevant, always included	We consider reputational risks as relevant in our climate-related risk assessments because a good reputation is key for our long-term success and a bad reputation could potentially affect the demand for our products or our access to capital. Reputational risks are managed on various levels. For instance, our Group functions Corporate Sustainability and Investor Relations as well as the businesses are in close contact with customers, investors, rating agencies etc. To mitigate this risk, we regularly conduct materiality analyses in the framework of Merck's Sustainability Report that integrate feedback from multiple internal and external stakeholders. By this, we safeguard that we cover the topics relevant to Merck (e.g., risks from climate change) within our sustainability strategy which is reviewed by the Group-wide Merck Sustainability Board under the overall responsibility of the Chairwoman of the Executive Board and CEO of Merck. Example: Merck considers potential risks arising from climate-related reputation which could potentially affect the demand for our products or our access to capital. Worldwide, investors, customers, NGOs and the public are increasingly focusing on how companies are dealing with sustainability issues such as climate change and how they are integrating these topics into their business strategies and communication. Currently, we do not see increasing climate-related reputation risks for Merck. For instance, since September 2008, our company is listed in the FTSE4Good Index, an important sustainability index that assesses the social, ecological and ethical conduct of companies. Nevertheless, we react on increasing requirements, for instance, by taking into account the requirements of the TCFD in our Sustainability Report or by setting a science-based, 1.5°C-aligned target in 2022. By this, our reputation is further strengthened, stakeholder expectations are fulfilled.
Acute physical	Relevant, always included	We consider acute physical risks as relevant in our climate-related risk assessments because increases in severity and frequency of extreme weather conditions such as hurricanes, cyclones or floods could impact our business activities negatively. Merck has approx. 100 production sites in 19 countries across the globe and a global supply chain, too. Therefore, acute physical risks might have significant impact on individual sites and parts of our supply chain leading to increased operational and capital cost and disruption in our production. Acute physical risks are covered by the risk management on Group and asset level. We recognize, assess and manage risks early on and implement appropriate measures to minimize them through our systematic risk management activities. The aim of Merck's group-wide Business Continuity Management (BCM) for instance is to ensure the uninterrupted availability of all key business and mission-critical business activities, even in case of a disaster. Multiple sourcing and back-up manufacturing facilities safeguard the undisturbed supply of important raw materials and respectively production of our products. Among many other reasons, climate related issues can be one trigger for business interruptions. BCM consists of following main steps: prioritization, business impact analysis, risk assessment/mitigation, recovery and response measures. In this process site management has the responsibility of maintaining the ability of its organization to function without disruption. The business sectors compile and prioritize the individual business continuity plans into an overall concept and the respective global function monitors and steers the process (e.g., by providing policies, SOPs etc.). Finally, possible risks of property damage and business interruption at Merck sites because of climate change related weather events are covered by insurance like comparable risks from other reasons. Example: In 2017, two sites in the US had to be closed down out of precautionary measures because of hurricane Irma. Nevertheless, there was no physical damage and the financial damage was low. Events like this might increase in number and impact in future. To further evaluate any acute or chronic physical risks from climate change we conducted a qualitative climate risk assessment including scenario analysis in 2022. Quantitative scenario analyses are currently being conducted (2023) with support from external consultants.
Chronic physical	Relevant, always included	We consider chronic physical risks as relevant in our climate-related risk assessments because climate change-related changes in weather patterns pose risks to our production and supply chain. Mainly precipitation extremes, such as droughts leading to water scarcity might have adverse impacts. Merck has approx. 100 production sites in 19 countries across the globe and a global supply chain, too. Therefore, chronic physical risks might have significant impact on individual sites and parts of our supply chain leading to increased operational and capital cost and disruption in our production. Chronic physical risks are covered by the risk management on Group and asset level. We recognize, assess and manage risks early on and implement appropriate measures to minimize them through our systematic risk management activities. The aim of Merck's group-wide Business Continuity Management (BCM) for instance is to ensure the uninterrupted availability of all key business and mission-critical business activities, even in case of a disaster. Multiple sourcing and back-up manufacturing facilities safeguard the undisturbed supply of important raw materials and respectively production of our products. Among many other reasons, climate related issues can be one trigger for business interruptions. BCM consists of following main steps: prioritization, business impact analysis, risk assessment/mitigation, recovery and response measures. In this process site management has the responsibility of maintaining the ability of its organization to function without disruption. The business sectors compile and prioritize the individual business continuity plans into an overall concept and the respective global function monitors and steers the process (e.g., by providing policies, SOPs etc.). To further evaluate any acute or chronic physical risks from climate change we conducted a qualitative climate risk assessment including scenario analysis in 2022. Quantitative scenario analyses are currently being conducted (2023). Example: We conducted an evaluation of our manufacturing sites using the risk classification of the Aqueduct Water Risk Atlas. Approx. 20 Merck manufacturing sites are located in areas with a high water risk (water risk factor 3 and 4 according to Aqueduct Water Risk Atlas). Although their overall water consumption is low compared to some other sites, these sites are in the focus of Merck's water intensity goal as well.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation	Carbon pricing mechanisms
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Primary potential financial impact

Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

We see current and emerging regulations on carbon pricing mechanisms like Emission Trading Schemes (ETS) as a risk for Merck. ETSs etc. will affect Merck directly through an increase in operational costs and indirectly via our supply chain through higher raw material prices.

Globally, the number of ETSs in operation increased to 28 and the share of global emissions covered by an ETS increased from 8% to 17%. 20 more systems are under development or consideration across the world (EMISSIONS TRADING WORLDWIDE, Status Report 2023, ICAP). This affects or will affect Merck that has subsidiaries in more than 66 countries and 101 manufacturing sites in 19 countries.

For instance, the EU Emissions Trading System (EU ETS) is a cornerstone of the EU's policy to combat climate change and a key tool in reducing greenhouse gas and to reach EU's 2030 reduction target. This poses a risk to the European industry as this will have an impact on the annual reduction in the 'cap' on emissions from EU ETS sectors and will increase the price of carbon allowances (EUA). With emissions of approx. 76,636 t of CO₂ in 2022 the heating and power plants at the Darmstadt and Gernsheim sites in Germany fall under the EU ETS and are directly affected by these cost risks.

Time horizon

Medium-term

Likelihood

Very likely

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

50000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Approach:

The potential impact of this risk is increased prices for our purchased energy due to an increasing number of cap and trade schemes, carbon taxes etc. and due to continuous tightening of existing cap and trade schemes, carbon taxes etc. (e.g., EU ETS).

Calculation/Assumptions:

The mentioned maximum figure of 50 million Euros per year is incremental costs based on an estimate of Merck's GHG emissions in 2030 and an assumed carbon price of 100 Euro/ton (calculation: 500,000 ton CO₂eq x 100 Euro/ton = 50,000,000 Euro). In our risk management this is the 'expected case' approach.

Cost of response to risk

15000000

Description of response and explanation of cost calculation

Description of response: Prices on carbon increase Merck's operational costs. Therefore, we react on this with measure to reduce our energy consumption and to increase energy efficiency. Our business sectors implemented processes to detect energy and GHG reduction possibilities and to implement respective projects.

Case Study:

Situation: Merck is committed to reduce its Scope 1 and 2 emissions by 50% by 2023 (1.5°C target approved by SBTi).

Task: Further reduction of emissions from own operations is required.

Action: Merck is investing in GHG emission reduction projects to reduce its process-related and energy related GHG emissions.

Examples:

- In 2022, our pilot exhaust gas abatement unit in Hometown (Pennsylvania, USA) reached operational readiness, achieving a high efficiency of almost 99%. By this, we have paved the way to reduce emissions from our main single source tremendously in the upcoming years.

- In 2022, for instance, a variety of energy efficiency initiatives helped us save around 3,000 metric tons of CO₂eq at our global headquarters in Darmstadt (e.g., we improved heating, ventilation and air conditioning systems and reduced base loads for compressed air systems).

Result: In 2022, Merck implemented energy efficiency and GHG emission reduction projects summing up to a minimum of 79.5 kilotons of GHG savings (not considering new contracts for the purchase of renewable electricity).

Explanation of cost calculation:

Based on experiences from past years and the dedicated budgets of our Life Science and Healthcare business sector we estimate that we spent at a minimum 15 mEuros per year to mitigate this risk.

Assumptions:

In 2022, the energy and water efficiency program of our Life Science business sector had a dedicated budget of 4.6 mEuros. Our Healthcare business sector invested approx. 10 mEuros in sustainability-related projects. We assume that two thirds of the budget of Life Science and Healthcare have been used for climate-related projects: (4.6x2/3)+(10x2/3)=9.5 mEuros. Estimate for our Electronics business sector: average of the budgets of the two other business sectors: 4.8 million Euros. Besides this, we assume another 0.7 mEuros for projects that have been implemented outside of our business sectors.

Total: 9.5+4.8+0.7=15 million Euros.

Nevertheless, accurate costs of response to these risks covering all of Merck's activities are part of the standard operational costs of Merck's sites and cannot be extracted from there.

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical	Other, please specify (Storms, tornadoes, hurricanes/typhoons, cyclones, heat waves, droughts, flood, heavy precipitation, wildfire etc.)
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Primary potential financial impact

Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

All climate models anticipate an increase in extreme weather conditions like storms, floods, heat waves and droughts. The IPCC report describes the impact of climate change with increased temperatures and more intense as well as more frequent extreme weather conditions. Short-term extreme weather conditions and long-term climate change, whose intensity can vary according to the geographic region, will impact Merck's sites globally. For instance, Merck had to shut down two sites in the US during a hurricane in 2017. Events like this might increase in number and impact in future. Because those weather-related events occur mostly in a limited area, the magnitude of impact is seen as low at this time.

Time horizon

Long-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

25000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The mentioned financial impact of approx. 25 million Euros is the insurance deductible to be covered by Merck in case of a damage. Weather-related events such as storms, floods, heat waves and droughts could interrupt the production at our sites directly or indirectly via interruptions in our supply chain. This could have an impact on our overall production capacity and sales and therewith have direct financial implications. Because those weather-related events occur mostly in a limited area, the magnitude of impact is seen as low. Nevertheless, possible risks of property damage and business interruption at Merck sites because of climate change related weather events are covered by insurance like comparable risks from other reasons.

Cost of response to risk

3000000

Description of response and explanation of cost calculation

Description of response:

We see an increased severity and frequency of extreme weather events that might impact our sites globally. Case study: we have multiple sites that are located in areas that might be impacted by hurricanes (e.g., Savannah, US) or by tornados (e.g., St. Louis, US). Other sites are located close to rivers where flooding might be an issue (e.g., Gernsheim, Germany). To mitigate and adapt to these risks we have to better understand the physical risks at our single sites.

Therefore, in 2022, we conducted a project on qualitative climate-related scenario analyses to integrate the results into our risk management. Quantitative scenario analyses are currently being conducted (2023).

Besides this, we recognize, assess and manage risks early on and implement appropriate measures to minimize them through our systematic risk management activities. The aim of Merck's group-wide Business Continuity Management (BCM) for instance is to ensure the uninterrupted availability of all key business and mission-critical business activities, even in case of a disaster. Multiple sourcing and back-up manufacturing facilities safeguard the undisturbed supply of important raw materials and respectively production of our products. Among many other reasons, climate related issues can be one trigger for business interruptions. BCM consists of following main steps: prioritization, business impact analysis, risk assessment/mitigation, recovery and response measures. In this process site management has the responsibility of maintaining the ability of its organization to function without disruption. The business sectors compile and prioritize the individual business continuity plans into an overall concept and the respective global function monitors and steers the process (e.g., by providing policies, SOPs etc.). In case of climate-related emergency situations because of extreme weather events, Merck's Group-wide site emergency planning and response system will take effect to minimize potential impacts on Merck's employees, local residents, facilities, the local environment and business.

Explanation of cost calculation: The above-mentioned figure of 3 million Euros for the cost of response to the risk is the share of the insurance premia to cover damages from floodings and storms. Further costs of response to risks are part of the standard operational costs of Merck's sites and include among other personnel costs.

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

For many companies' raw materials and other purchased goods are important drivers of their environmental impact; e.g., Scope 3 GHG emissions are often dominated by category 1 'Purchased goods and services'. Therefore, offering product solutions with improved sustainability features (e.g., a reduced carbon footprint) bears competitive advantages. As several of our customers have emission reduction targets. We see an increase in the demand for products tackling climate transition risks and for more sustainable product alternatives. Our Life Science business sector has created an ambition to have 10% greener alternative products by 2030 and have created tools and investment approaches to achieve this. We have also kicked off a project to measure the carbon footprint of all our products and identify areas for improvements. Merck Life Sciences works across its business units to drive product-related sustainability, for instance we developed a Design for Sustainability (DfS) and the DOZN™ tool to create more sustainable products for our customers.

Through our DfS framework, we follow a comprehensive approach to increasing the sustainability of our Life Science products. The DfS: Developed pillar provides our product developers with a systematic approach that enables them to analyze product impacts in terms of materials used, energy and emissions, water, packaging, usability, innovation, and circular economy as well as supplier- and manufacturing-related issues. When developing a new product, our aim is to improve on as many of these criteria scores as possible.

Our proprietary, web-based tool, DOZN™, enables us to evaluate various products and/or processes to identify opportunities for sustainability improvements and provide transparency to our customers. DOZN™ operationalizes the 12 Principles of Green Chemistry, a previously theoretical framework, and rates products in three stewardship categories of "Improved resource use", "Increased energy efficiency", and "Reduced human and environmental hazards".

In a grouping of Request for Proposals (RFPs) one of Merck's customers highlighted Life Science's Greener Products and Solutions (GP&S) approach to sustainability as a distinguishing factor, which helped solidify the RFP win versus other vendors. Based on this, we see an increase in customer demand for greener alternatives and increased revenue.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

40000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The potential financial impact figure of 40 million Euro was extrapolated based on the incremental opportunities we have with one of our key account customers based on our sustainability programs and broad array of greener alternative products.

Merck has already commercialized greener alternative products that have driven incremental revenue. For example, we collaborated with academia and the private sector to launch Cyrene, a greener biobased alternative solvent that is almost energy neutral and releases water to the environment during its manufacturing. Rigorous safety tests demonstrate that it has very low toxicity. Cyrene can replace widely used solvents such as DMF in several applications in pharmaceutical and chemical synthesis. Organic solvents like DMF are under worldwide regulatory pressure due to major concerns over their toxic effects on the reproductive system. Solutions like Cyrene have the potential to replace a significant portion of the 225kt of production DMF currently represents. Cyrene creates a major opportunity for sustainable growth for Merck. We have set a goal to develop 10% greener alternative products in our portfolio and we have calculated the potential financial impact figure considering the increased revenue our ambition can unlock and our recent experience generating incremental revenue through greener alternative products.

More detailed explanations are not possible as these are business confidential data.

Cost to realize opportunity

1000000

Strategy to realize opportunity and explanation of cost calculation

Strategy to realize opportunity:

Situation: Climate change and the related transitional risks trigger companies to seek for more sustainable product alternatives.

Task: To meet the shifting needs of our customers requires investment, research, and development of more sustainable products.

Action: Our Life Science business sector has created a public goal to have 10% greener alternative products by 2030. We work across business units to drive product-related sustainability.

Through our Design for Sustainability (DfS) framework, experts from QA, R&D, manufacturing, and other functions follow a comprehensive approach to increasing the sustainability of our Life Science products. DfS provides our product developers with a systematic approach that enables them to analyze and improve product impacts in terms of materials used, energy and emissions, water, packaging, usability, innovation, and circular economy as well as supplier- and manufacturing-related issues.

Our proprietary, web-based tool, DOZN™ operationalizes the 12 principles of Green Chemistry to make improvements across the categories of "Improved resource use", "Increased energy efficiency", and "Reduced human and environmental hazards".

Timescale for Implementation: This opportunity is ongoing, as our Life Science business continues to innovate more efficient products.

Result: We have already developed greener alternative product successfully. For example, we collaborated with academia and the private sector to launch Cyrene, a greener biobased alternative solvent that is almost energy neutral and releases water to the environment during its manufacturing. Rigorous safety tests demonstrate that it has very low toxicity. Cyrene can replace widely used solvents such as DMF in several applications in pharmaceutical and chemical synthesis. Organic solvents like DMF are under worldwide regulatory pressure due to major concerns over their toxic effects on the reproductive system. Solutions like Cyrene have the potential to replace up to 225kt of production of current solvents and represent a major opportunity for sustainable growth for Merck.

Explanation of cost calculation:

The costs to realize this opportunity (approx. 1 million Euros) are based on expert estimates. In 2022, our Life Science business sector spent approx. 399 million Euros in R&D in total. The calculation is based on our experience developing successful greener alternative product in the past few years.

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Development of climate adaptation, resilience and insurance risk solutions

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

Climate change and increasing temperature will promote the spread of diseases which bears opportunities for pharmaceutical and Life Science companies.

According to WHO's estimates, nearly half of the world's population is at risk of contracting malaria. In 2020, more than 200 million cases of malaria and over 600,000 related deaths were recorded, with about 80% occurring in children under the age of five. 95% of cases and 96% of deaths occur in Africa. Through our As One Against Malaria program, we help to deliver integrated and sustainable health solutions involving treatments, diagnostics and preventive measures to fight malaria. As part of this program, we are developing a new drug (M5717) with the potential to be a promising treatment and preventive option for malaria due to its activity in several different stages of the parasite's life cycle. The drug has successfully completed two clinical Phase I studies as a single agent for cure and prevention

Preventive methods such as insect repellents are part of the strategic toolkit to combat malaria. We are testing our insect repellent IR3535® for potential use in malaria. IR3535® is already used for protection against insect and tick bites that can transmit diseases such as Lyme disease, Zika, dengue fever, and chikungunya.

Partnerships and dialogue are critical to addressing global health challenges and improving access to healthcare. Our partners include multinational organizations, government agencies and NGOs, as well as academic institutions, health industry associations, private companies, and independent global health experts. In 2022, we continued to engage with our partners and key stakeholders, including WHO, to advance global health discussions and address shared challenges, including neglected tropical diseases. We collaborate with partners such as the END Fund, WIPO and DNDi, as well as with academia in African countries. We engage in consortia of partners, such as the Pediatric Praziquantel Consortium, alliances, like the Swiss Malaria Group, and advocacy groups, including the Uniting to Combat NTDs and GSA. In addition, we work closely with foundations that support scientific research and health access, including the Bill & Melinda Gates Foundation and the Access to Medicine Foundation. We have also joined forces with funders, including the Global Health Innovative Technology Fund (GHIT) and the European and Developing Countries Clinical Trials Partnership (EDCTP).

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

We see an increase in the demand for products from our businesses tackling climate related diseases. This results in an increase in annual sales. Nevertheless, financial implications of these opportunities are hard to estimate.

Cost to realize opportunity**Strategy to realize opportunity and explanation of cost calculation**

Strategy to realize opportunity:

We help to deliver integrated and sustainable health solutions involving treatments, diagnostics and preventive measures to fight malaria.

- 1) We are developing a new drug (M5717) with the potential to be a promising treatment and preventive option for malaria due to its activity in several different stages of the parasite's life cycle. The drug has successfully completed two clinical Phase I studies as a single agent for cure and prevention
- 2) Preventive methods such as insect repellents are part of the strategic toolkit to combat malaria. We are testing our insect repellent IR3535® for potential use in malaria. IR3535® is already used for protection against insect and tick bites that can transmit diseases such as Lyme disease, Zika, dengue fever, and chikungunya.
- 3) Partnerships and dialogue are critical to addressing global health challenges and improving access to healthcare. Our partners include multinational organizations, government agencies and NGOs, as well as academic institutions, health industry associations, private companies, and independent global health experts. In 2022, we continued to engage with our partners and key stakeholders, including WHO, to advance global health discussions and address shared challenges, including neglected tropical diseases. We collaborate with partners such as the END Fund, WIPO and DNDi, as well as with academia in African countries. We engage in consortia of partners, such as the Pediatric Praziquantel Consortium, alliances, like the Swiss Malaria Group, and advocacy groups, including the Uniting to Combat NTDs and GSA. In addition, we work closely with foundations that support scientific research and health access, including the Bill & Melinda Gates Foundation and the Access to Medicine Foundation. We have also joined forces with funders, including the Global Health Innovative Technology Fund (GHIT) and the European and Developing Countries Clinical Trials Partnership (EDCTP).

Explanation of cost calculation:

This is part of our regular portfolio management and Research and Development approach that has several drivers. The costs cannot be allocated to activities caused by climate change only.

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Use of more efficient production and distribution processes

Primary potential financial impact

Reduced direct costs

Company-specific description

The UN identified climate change as one of the major risks globally. Most countries worldwide committed to limit global warming by reducing greenhouse gas emissions with the Paris Agreement. Based on this many countries adapt or plan to adapt their legislation to safeguard emission reductions. The EU for instance has agreed on the European Green Deal to accelerate the transition the EU economy to a sustainable economic model with the overarching objective to become the first climate neutral continent by 2050. Based on this decision, the EU started to revise key legislation like the Renewable Energy Directive, the Energy Efficiency Directive, the Emissions Trading System, the Energy Performance of Buildings Directive etc. This will further increase carbon prices (e.g., CO2 taxes), adjust financing incentives (e.g., EU Taxonomy) and drive changes of technology (e.g., fostering renewable energy). Many of these changes will impact Merck's European manufacturing sites. For instance, the EU Emissions Trading System (EU ETS) is a cornerstone of the EU's policy to combat climate change and a key tool in reducing greenhouse gas and to reach EU's 2030 reduction target. With emissions of approx. 76,636 t of CO2 in 2022 the heating and power plants at the Darmstadt and Gernsheim sites in Germany fall under the EU ETS and are directly affected by these cost risks. In addition, the Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz BEHG) in Germany has introduced a national carbon pricing system for fuels which will also affect Merck's German sites. Around the world countries set net-zero targets (e.g., China in 2060) and think about introducing cap and trade schemes, etc. as economic means to reduce greenhouse gas emissions. Besides already existing emission trading schemes, several countries (e.g., China, South Korea, Japan, Mexico, some US states) have scheduled or considered cap and trade schemes. This will affect Merck that has subsidiaries in more than 66 countries and manufacturing sites in the countries mentioned above by increased operational costs.

Out of these reasons, energy efficiency is an important cornerstone in our decarbonization process. Efficiency gains will reduce our operational costs or at least reduce the magnitude of increase. Additionally, regulations on energy efficiency and greenhouse gas emissions are often linked to incentive systems (subsidies from governments etc.). Using these incentives may offer additional cost reductions.

Time horizon

Medium-term

Likelihood

Very likely

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Financial implications of these opportunities are hard to estimate.

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation

Strategy to realize opportunity:

The impact of energy and carbon costs on Merck's operational costs is increasing due to various climate-related regulations (e.g., emission trading schemes, carbon taxes). Energy saving and energy efficiency measures offer the opportunity to reduce costs or to keep costs under control. To detect and implement such measures, Merck follows different approaches:

- Dedicated budget: As part of the energy and water efficiency program of our Life Science business sector, we rolled out new tools and governance structures in 2022 to help us assess projects to save energy and water. The energy and water efficiency program had a capital expenditure budget of € 4.6 million in 2022, which we increased to € 9.3 million in 2023.
- Training: In 2022, we formally trained 18 additional Facility, Plant Engineering, and EHS Managers from sites globally on energy management.
- ISO 50001 Energy Management certification: Meanwhile, 13 manufacturing sites are certified according to ISO 50001 Energy Management. Among them are two of our major sites, the headquarters Darmstadt and Gernsheim which contribute to more than 20% of Merck's overall energy consumption. This implies that the sites set themselves energy saving targets.
- Energy saving targets on site level (e.g., all sites of our Life Science business sector have energy targets).
- Two of our EHS standards, "Energy Management" and "Emissions of Refrigerants", enable energy and process-related emissions to be managed consistently.

By this, Merck expects to reduce its operational costs or at least limit their increase.

Explanation of cost calculation:

Costs to realize this opportunity are hard to estimate.

Comment

Identifier

Opp4

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Development of new products or services through R&D and innovation

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

In the Electronics industry various chemicals are used, e.g., Etch and Clean gases. Several of them like NF3 show high greenhouse gas warming potentials (GWP) and are emitted as process-related scope 1 emissions. Low-GWP gases solutions help to reduce our customer's scope 1 emissions as well as Merck's scope 3 emissions. So, they are a meaningful step forward in support of both side's sustainability goals. We see this as an opportunity to expand our market share, further establishing Merck as an innovation partner.

Time horizon

Medium-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

We see an increase in the demand for more sustainable products from our businesses. This results in an increase in annual sales. Nevertheless, financial implications of these opportunities are hard to estimate

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation

Strategy to realize opportunity:

Merck proactively reaches out to customers to join forces and support their sustainability goals. Within Merck's sustainability strategy, our Electronics business sector has set a focus on the sustainability of its products. Reducing the environmental impact of products is an important part of the R&D process. Merck's Electronics R&D team has been actively engaging with one of our main customers to develop low-GWP gases solutions, starting with Etch and Clean gases. After a year of iterative collaboration, our customer is now testing an alternative low-GWP Etch gas from our lab to validate its process performance to replace a traditional, high global warming material. We are also collaborating on new, low emission gases for chamber cleaning applications.

Explanation of cost calculation:

Costs to realize this opportunity are hard to estimate. Overall, Merck is continuously investing in research and development of climate related product solutions and engages in various research projects.

Comment

C3. Business Strategy

C3.1

(C3.1) Does your organization’s strategy include a climate transition plan that aligns with a 1.5°C world?

Row 1

Climate transition plan
No, but our strategy has been influenced by climate-related risks and opportunities, and we are developing a climate transition plan within two years

Publicly available climate transition plan
<Not Applicable>

Mechanism by which feedback is collected from shareholders on your climate transition plan
<Not Applicable>

Description of feedback mechanism
<Not Applicable>

Frequency of feedback collection
<Not Applicable>

Attach any relevant documents which detail your climate transition plan (optional)
<Not Applicable>

Explain why your organization does not have a climate transition plan that aligns with a 1.5°C world and any plans to develop one in the future
A transition plan hasn’t been an immediate priority within Merck’s decarbonization journey. In the past years we have developed a new sustainability strategy and integrated it in the business strategy of our three business sectors. Parallel, new climate targets (on scope 1, 2 and 3) have been developed and implemented. In May 2022, the SBTi has classified our scope 1 and 2 target ambition and has determined that it is in line with a 1.5°C trajectory.
In 2022, we conducted a project on qualitative climate-related scenario analyses to integrate the results into our risk management and to safeguard compliance with TCFD-aligned requirements. Hereby, climate-related risks and opportunities (physical/transitional) have been covered. Quantitative scenario analyses are currently being conducted (2023) with support from external consultants which will cover approx. 100 Merck sites worldwide. Based on the outcome of this quantitative scenario analysis, the decision will be taken whether we set up a transition plan.

Explain why climate-related risks and opportunities have not influenced your strategy
<Not Applicable>

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative, but we plan to add quantitative in the next two years	<Not Applicable>	<Not Applicable>

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenario		Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios	IEA NZE 2050	Company-wide	<Not Applicable>	Qualitative scenario analysis on transition risks/opportunities. Parameters: - Derivation of relevant cost factors and development markets based on data input and interviews with company experts, incl. criticality of products - Research and assumptions based on the climate scenario models regarding the drivers and developments behind the relevant factors and markets in a 1.5°C scenario - Derivation of the effects of the defined risk drivers on the status quo of Merck and the possible development of the company in a future 1.5°C scenario - Short-term assessment (2030), long-term assessment (2050) Assumptions: - 1.5°C temperature increase due to intensive action tackling climate change; more transition risks (e.g., policy and legal, technology, market, reputation) and opportunities (e.g., resource efficiency, market) will materialize if we embark on a transition path. Analytical choices: - Policy & Legal: Increasing Carbon Prices, Increasing regulations regarding environmentally critical materials, Additional disclosures about environmental information - Market Change: Change in the global energy mix leading to decreasing energy prices, Changing stakeholder preferences towards products seen as environmentally friendly, Transformation of the transportation sector to sustainable fuels, Gross Domestic Product GDP and population growth as an underlying scenario driver - Technological Advancement: Efficiency gains and re-use of materials, Technological solutions to support a green transformation across sectors and a low-carbon transition, Advancements in packaging materials and usage - Reputation: Increased stakeholder concern and pressure toward climate actions, Consumer concerns about impact of chemicals and waste for the environment, Increased relevance of external sustainability ratings
Physical climate scenarios	RCP 8.5	Company-wide	<Not Applicable>	Qualitative scenario analysis on physical risks/opportunities. Parameters: - Suppliers: name, addresses, supplied volume, relevance of supplier to Merck; country based analysis (top 25 countries by purchasing costs) - Own Operations: address and occupancy type; focus on current production sites (country level and site specific) - Customers: sales volume and destination countries; country based analysis - Short-term assessment (2030), long-term assessment (2050) Assumptions: - ~4°C temperature increase due to lacking action tackling climate change resulting in high risks - By definition, climate scenarios describe one possible future to which one cannot assign a probability. Analytical choices: - In the qualitative analysis, the three parts of Merck's value chain – supply, production and customers – are considered independently from each other. - The approach is based on annual average impacts of physical climate risk. Events with high return periods, e.g., 100 years, are not explicitly captured, but rather implicitly included over time as part of the annual average impact. - The current level of adaptive capacity (including fire and flood protection) is not part of the qualitative analysis. - The selection of sites is based on the economic materiality (production costs, manufacturing and insurance assessments), a geographical diversification, regulatory requirements as well as business section expertise. - While considering current risks locally for specific assets, the future scenarios are based on sector and country averages, company-specific effects are smoothed across the entire sector and local differences in hazards are smoothed across entire countries.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

Focal question transition risks/opportunities:

Which business activities will be more likely to suffer from the impact of transitional risks and what represent climate-related opportunities for our company?

Focal question physical risks/opportunities:

Which business activities will be more likely to suffer from the impact of physical risks? And how can we categorize the business interruption potential along the value chain?

Rationale for selecting scenarios:

For our company-wide qualitative scenario analysis we selected two "extreme" scenarios:

- 1.5C (IEA NZE 2050): If the world embarks on a transition path towards a 1.5°C world, more transition risks (and opportunities) will materialize. For instance, policy and legal, technology, market, reputation.
- 4°C (RCP 8.5): 'Do nothing scenario'. If we do NOT embark on a transition path, less transition risks will materialize but much more acute and/or chronic physical risks. For instance, heavy weather extremes, floods, droughts, sea level rise etc.

Results of the climate-related scenario analysis with respect to the focal questions

1) Results scenario analysis transition risks (slight variations between Merck's business sectors Healthcare, Life Science and Electronics):

Suppliers:

- Along the supply chain Merck could benefit from decreasing energy costs and efficiency gains, which can impact procurement costs positively. In contrast to this, one of our most important risks is higher costs for GHG emissions, which could occur along the supply chain.
- Prices for organic chemicals might increase leading to medium risks for Merck.
- Processing hazardous waste might become more expensive by 2050, leading to medium risks for Merck.

Own operations:

- In own production, decreasing electricity prices could become an opportunity whereas the use of natural gas might lead to high CO2 costs by 2050. The same applies for increasing CO2 costs for GHG emissions.

Customers:

- Demand in the Healthcare sector is increasing due to wider accessibility to medicine and pharmaceutical products (not directly linked to climate impacts).
- The Life Science sector will see a demand increase linked to an increased need for medical solutions (not directly linked to climate impacts).
- Demand in the Electronics sector is increasing due to GDP growth as well as technological advancement needed for a net zero transformation.

2) Results scenario analysis physical risks:

Suppliers:

- Low risk of supply chain interruptions
- If the supplier's production sites are affected by hazards, this could lead to interruptions in production, endangering Merck's procurement and hence own production processes.
- It is assumed that in a global market, regional or local disruptions can in most cases be compensated by other suppliers or locations.
- Therefore, the risk of supply shortages due to climate-related events is evaluated as low on an aggregated level.

Own operations:

- Within the value chain, own operations could be most affected by physical risks, including flood, sea level rise and tropical cyclones

Customers:

- Merck's customers could be affected by physical risks, however, Merck could benefit from helping to contain the spread of infectious diseases
- Due to Merck's heterogeneous client portfolio the negative impact of physical climate risks on customer markets is evaluated as moderate, with no significant influence on Merck's sales
- There could be a market opportunity due to the spread of infectious diseases currently confined tropical climate zones based on long-term temperature rise

3) Results informing a decision/action:

The results of the qualitative scenario analysis triggered the decision to go for a quantitative scenario analysis which is currently being conducted (2023) with support from external consultants and which will cover approx. 100 Merck sites worldwide.

Besides this short-term activity, the results of the scenario analysis of transition risks will trigger a reassessment of the criticality of materials and existence of single suppliers, countries or regions in the mid-term run.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Sustainable products play an essential role to mitigate transition risks (e.g., reputation) and to drive opportunities from climate-change (e.g., increased revenue from increased demand for products). The sustainable innovation that we envision or drive forward must align with and support the three goals of our sustainability strategy. We define sustainable innovation as new or improved products, services, technologies, or processes that generate economic benefits and have positive environmental and social impacts. Therefore, we develop long-term solutions for our innovation and research activities that consider the entire value chain and evaluate each product's impact over its lifecycle. Today, our products already have a positive impact on human progress and global health, namely our medicines and our biological and chemical innovations that utilize the latest technologies. We want to continuously improve the way we measure our progress by adapting and integrating sustainability criteria into our product development processes across the business sectors. In 2022, we continued our partnership with the well-established patent information platform LexisNexis® PatentSight®. In this context, we created a framework to evaluate the sustainability impact of our intellectual property. For 2022, we evaluated the baseline for the first time and identified that 27% of our patent families published in that year have a positive sustainability impact based on LexisNexis® PatentSight®. To develop pioneering solutions that have a positive impact on society and support organic growth, we are exploring transformative technologies beyond our core products and markets. At the same time, we maintain strategic proximity to our business sectors to leverage our existing assets and capabilities. Business model innovation, including digital business models, is one approach we use to generate value for our business and stakeholders.
Supply chain and/or value chain	Yes	To address potential transitional risks (raw material cost increases due to emission trading systems etc.) and physical risks (business interruption due to heavy weather events) in our supply chain, Merck established a Supplier Decarbonization Program within Group Procurement. Through this program, we aim to reduce greenhouse gas emissions associated with purchased goods and services as well as capital goods. The cross-functional program team is driving the execution of a ten-year program as part of the decarbonization strategy that was defined in 2021. In 2022, we continued to provide training sessions and materials for procurement managers and sourcing teams and engaged further with suppliers by sharing information about our climate targets. Follow-up discussions were again held regarding the supplier decarbonization questionnaire to assess the current decarbonization status and progress made since last year. This allows our sourcing managers to collate relevant supplier data in a global monitoring database. We have also developed an automated carbon accounting tool to manage the large quantities of data on the CO₂ emissions of our suppliers. It has been available since the beginning of 2022 and we will continue adding new functionalities in the coming years. In 2022, we further strengthened our focus on purchasing electricity from renewable sources. In this period, we sourced 47% of our purchased electricity from renewables, meaning direct supply contracts and energy attribute certificates. The share of our total energy consumption by renewable energies increased to 20% in 2022. After signing a 12-year Virtual Power Purchase Agreement (VPPA) with the Azure Sky Wind and Storage project, the project went into commercial operation in May 2022. Furthermore, in 2022, we expanded our renewable energy commitment in the US through another VPPA (Liberty County Solar project, 40 MW) with a 16-year term. We are covering the power needs of multiple South American sites (for example Argentina, Chile, Guatemala) through renewable energy certificates. The same applies to several of our sites in China. In line with our renewable energy strategy, we completed an assessment of the European renewable electricity markets to determine our best path forward. This assessment will guide our renewable electricity purchasing strategy in the coming years.
Investment in R&D	Yes	Research and development (R&D) constitute a significant strategic lever for reducing our emissions exposure in view of climate-related transition risks and plays an essential role when looking at potential opportunities from climate-change. Through our Design for Sustainability (DFS) framework, we follow a comprehensive approach to increasing the sustainability of our Life Science products. DFS provides our product developers with a systematic approach that enables them to analyze product impacts in terms of materials used, energy and emissions, water, packaging, usability, innovation, and circular economy as well as supplier- and manufacturing-related issues. We have developed sustainability criteria that can be used to rank a product's performance in each of these areas. Our Healthcare business sector is developing an overarching strategy to make our medicines, our medical devices and their packaging more ecologically sustainable and user-friendly. In 2022, we started to implement the Design for Sustainability framework in our Healthcare R&D approach. We will also establish a governance framework to integrate sustainability and define sustainability criteria for qualitative and quantitative scorecards that can be used to measure sustainability impacts. In our Electronics business sector, we aim to reduce any potential adverse environmental impacts of our products. For instance, - in 2022, we developed and launched a scorecard focusing on sustainable criteria in the development of new products and solutions. - in 2022, we started to review our current product portfolio in order to understand the current sustainability profile and determine whether greener and equally effective chemistry alternatives are available. - we seek to establish partnerships with our customers to optimally understand how our products and activities can contribute to their sustainability goals. In 2022, we established a partnership with one of our customers to develop and eventually produce gas solutions with a low global warming potential.
Operations	Yes	The number of carbon pricing mechanisms are increasing globally affecting Merck that operates in 66 countries. Emission trading schemes, carbon taxes etc. are already affecting our operational costs and we are assuming an even increased impact. Therefore, Merck invests continually into energy efficiency/ saving and greenhouse gas reduction measures at its sites and further develops its own energy supply. For instance, to reduce this kind of transition risks and to reduce our operational costs our Life Science business sector decided in 2021 to provide a dedicated budget for energy efficiency measures. Its energy and water efficiency program had a capital expenditure budget of € 4.6 million in 2022, which we increased to € 9.3 million in 2023. In our Life Science business sector, we are tracking process-related emissions primarily from the release of perfluorinated hydrocarbons (PFCs). Consequently, we already replaced several emission-intensive production lines with equipment that does not emit PFCs, resulting in a reduction of CO₂eq by 40,000 metric tons between 2021 and 2022. In 2022, we also focused on developing the methods to eliminate the remaining PCF emissions from these processes, which we plan to implement and complete before 2030. With the integration of Versum Materials, acquired in 2019, into the Electronics business sector, our process-related emissions increased sharply – mainly in the production of special chemicals for the electronics industry. In 2022, our pilot exhaust gas abatement unit in Hometown (Pennsylvania, USA) reached operational readiness, achieving a high efficiency of almost 99%. Based on this technology we will invest in additional units in 2023 to reduce process-related NF₃ emissions in subsequent years.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Capital expenditures Capital allocation	Capital expenditure: To mitigate transitional risks (e.g., from increased carbon prices) Merck introduced a sustainability evaluation ("Green business case" with CO₂e emission measures and cost savings) using a shadow price of 100 Euro/t CO₂e. This is mandatory as of January 1st, 2022, for all investment projects larger than 10 million Euros. The shadow price has to be considered for the whole Merck Group. Clear implication is to set a focus and sensitivity to the carbon emissions in large capital expenditure projects. Capital allocation: - Efficiency programs: As part of the energy and water efficiency program of our Life Science business sector, we rolled out new tools and governance structures in 2022 to help us assess projects to save energy and water. The energy and water efficiency program had a capital expenditure budget of € 4.6 million in 2022, which we increased to € 9.3 million in 2023. - Process-related emissions: In our Life Science business sector, we are tracking process-related emissions primarily from the release of perfluorinated hydrocarbons (PFCs). Consequently, we already replaced several emission-intensive production lines with equipment that does not emit PFCs, resulting in a reduction of CO₂eq by 40,000 metric tons between 2021 and 2022. In 2022, we also focused on developing the methods to eliminate the remaining PCF emissions from these processes, which we plan to implement and complete before 2030. - Process-related emissions: With the integration of Versum Materials, acquired in 2019, into the Electronics business sector, our process-related emissions increased sharply – mainly in the production of special chemicals for the electronics industry. In 2022, our pilot exhaust gas abatement unit in Hometown (Pennsylvania, USA) reached operational readiness, achieving a high efficiency of almost 99%. Based on this technology we will invest in additional units in 2023 to reduce process-related NF₃ emissions in subsequent years. - R&D: In our Life Science business sector, we work to reduce the adverse impacts of our products on health and the environment. This applies to the entire life cycle, from manufacture and use to end of life. At the same time, we seek to make our products more efficient and user-friendly, asking ourselves from the start of product development how to best reconcile these requirements. Through our Design for Sustainability (DfS) framework, we follow a comprehensive approach to increasing the sustainability of our Life Science products. The DfS development pillar provides our product developers with a systematic approach that enables them to analyze product impacts in terms of materials used, energy and emissions, water, packaging, usability, innovation, and circular economy as well as supplier- and manufacturing-related issues. We have developed sustainability criteria that can be used to rank a product's performance in each of these areas. When developing a new product, our aim is to improve on as many of these criteria scores as possible. To understand the potential environmental impacts throughout the product life cycle, we conduct streamlined product life cycle analyses. The findings from these analyses help us to improve our products and are incorporated into subsequent development stages. Experts from Research and Development (R&D), Product Management, Quality, Procurement, and other departments collaborate along every step of the process. In 2022, we implemented a new version of our DfS development pillar within our enterprise product development processes. The new framework introduces data-driven deliverables at each phase of our product development process to ensure we consider sustainability factors in all newly developed products. It also comprises a new scorecard system that helps our development teams address and minimize negative product and supply chain-related factors and improves our communication of product sustainability credentials to our customers. - R&D: In our Healthcare business sector, we aim to reduce any adverse impacts our medicines may have on the environment during their development, manufacture, transportation, use, and disposal. We are developing an overarching strategy to make our medicines, our medical devices and their packaging more ecologically sustainable and user-friendly. In 2022, we started to implement the Design for Sustainability framework in our Healthcare R&D approach. We will also establish a governance framework to integrate sustainability and define sustainability criteria for qualitative and quantitative scorecards that can be used to measure sustainability impacts. Our newly launched Green Biotech program helps to integrate sustainable innovation and state-of-the-art technology into our development processes and products along the clinical manufacturing value chain. - R&D: In our Electronics business sector, we aim to reduce any potential adverse environmental impacts caused by the manufacture, packaging, transportation, use, and disposal of our products. We view sustainability as a competitive advantage, and we proactively engage in partnerships with our customers to collectively drive more sustainable value creation. According to our new principle, highly hazardous materials are to be avoided in our product development process wherever possible. Therefore, we have also prioritized new green and innovative materials that deliver sustainable value to our customers. We are committed to a holistic approach comprising: 1) In 2022, we developed and launched a scorecard focusing on sustainable criteria in the development of new products and solutions. The scorecard is a tool for fostering a sustainability culture in our R&D by identifying opportunities and risks at early stages and acting accordingly. 2) We started a project to automatically calculate key sustainability performance indicators, such as process mass intensity, solvent and water intensity, as well as an estimate of the carbon footprint to improve the sustainability of chemicals and related manufacturing processes. 3) In 2022, we started to review our current product portfolio in order to understand the current sustainability profile and determine whether greener and equally effective chemistry alternatives are available. A multi-functional team is working to establish a process that puts greater emphasis on the sustainability and green chemistry aspects of our product portfolios. In addition, a Product Sustainability Committee was established in 2022 to oversee the portfolio sustainability assessment process and results. 4) We seek to establish partnerships with our customers to optimally understand how our products and activities can contribute to their sustainability goals. In 2022, we established a partnership with one of our customers to develop and eventually produce gas solutions with a low global warming potential; these are currently in a practical testing phase.

C3.5

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's climate transition?

	Identification of spending/revenue that is aligned with your organization's climate transition	Indicate the level at which you identify the alignment of your spending/revenue with a sustainable finance taxonomy
Row 1	No, but we plan to in the next two years	<Not Applicable>

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Absolute target
Intensity target

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Is this a science-based target?

Yes, and this target has been approved by the Science Based Targets initiative

Target ambition

1.5°C aligned

Year target was set

2020

Target coverage

Company-wide

Scope(s)

Scope 1

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Base year

2020

Base year Scope 1 emissions covered by target (metric tons CO2e)

1706410

Base year Scope 2 emissions covered by target (metric tons CO2e)

322020

Base year Scope 3, Category 1: Purchased goods and services emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 2: Capital goods emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 4: Upstream transportation and distribution emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 5: Waste generated in operations emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 6: Business travel emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 7: Employee commuting emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 8: Upstream leased assets emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 10: Processing of sold products emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 11: Use of sold products emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 13: Downstream leased assets emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 14: Franchises emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 15: Investments emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Other (upstream) emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Other (downstream) emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year total Scope 3 emissions covered by target (metric tons CO2e)

<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)

2028430

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1

100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2

100

Base year Scope 3, Category 1: Purchased goods and services emissions covered by target as % of total base year emissions in Scope 3, Category 1: Purchased goods and services (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 2: Capital goods emissions covered by target as % of total base year emissions in Scope 3, Category 2: Capital goods (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target as % of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 4: Upstream transportation and distribution covered by target as % of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 5: Waste generated in operations emissions covered by target as % of total base year emissions in Scope 3, Category 5: Waste generated in operations (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 6: Business travel emissions covered by target as % of total base year emissions in Scope 3, Category 6: Business travel (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 7: Employee commuting covered by target as % of total base year emissions in Scope 3, Category 7: Employee commuting (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 8: Upstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 8: Upstream leased assets (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target as % of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 10: Processing of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 10: Processing of sold products (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 11: Use of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 11: Use of sold products (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 13: Downstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 13: Downstream leased assets (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 14: Franchises emissions covered by target as % of total base year emissions in Scope 3, Category 14: Franchises (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Category 15: Investments emissions covered by target as % of total base year emissions in Scope 3, Category 15: Investments (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Other (upstream) emissions covered by target as % of total base year emissions in Scope 3, Other (upstream) (metric tons CO2e)

<Not Applicable>

Base year Scope 3, Other (downstream) emissions covered by target as % of total base year emissions in Scope 3, Other (downstream) (metric tons CO2e)

<Not Applicable>

Base year total Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)

<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes

100

Target year

2030

Targeted reduction from base year (%)

50

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]

1014215

Scope 1 emissions in reporting year covered by target (metric tons CO2e)

1424614

Scope 2 emissions in reporting year covered by target (metric tons CO2e)

242037

Scope 3, Category 1: Purchased goods and services emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 2: Capital goods emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 4: Upstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 5: Waste generated in operations emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 6: Business travel emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 7: Employee commuting emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 8: Upstream leased assets emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 9: Downstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 10: Processing of sold products emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 11: Use of sold products emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 12: End-of-life treatment of sold products emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 13: Downstream leased assets emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 14: Franchises emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 15: Investments emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Other (upstream) emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Other (downstream) emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Total Scope 3 emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)

1666651

Does this target cover any land-related emissions?

No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

% of target achieved relative to base year [auto-calculated]

35.670839023284

Target status in reporting year

Underway

Please explain target coverage and identify any exclusions

This target covers the whole Merck Group (operational control as specified in this questionnaire). In 2020/2021, Merck set itself a new set of climate goals. By 2030, we intend to lower our direct (Scope 1) and indirect (Scope 2) emissions by 50% (2020 baseline). Merck also commits to reduce scope 3 GHG emissions 52% per euro value added within the same timeframe. Both targets have been approved by the SBTi in May 2022.

By 2040, we intend to achieve climate neutral operations along our entire value chain. This target covers our Scope 1, 2 and 3 greenhouse gas emissions.

Plan for achieving target, and progress made to the end of the reporting year

Plan for achieving target:

At this time, we see three main levers to reduce our scope 1 and 2 emissions:

- Reduction of our process-related emissions
- Purchase of renewable electricity
- Improvements in energy efficiency/energy saving

Progress made:

In 2022 we reduced our scope 1 and 2 emissions by approx. 18% compared to 2020. The decrease in our scope 1 emissions (approx. 16%) was mainly triggered by improvement projects to reduce our process-related emissions. A higher share of electricity procured from renewable sources (47%, 2020: 27%) caused the decrease of approx. 25% in our scope 2 emissions.

List the emissions reduction initiatives which contributed most to achieving this target

<Not Applicable>

Target reference number

Abs 2

Is this a science-based target?

No, but we are reporting another target that is science-based

Target ambition

<Not Applicable>

Year target was set

2020

Target coverage

Company-wide

Scope(s)

Scope 1

Scope 2

Scope 3

Scope 2 accounting method

Market-based

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Base year

2020

Base year Scope 1 emissions covered by target (metric tons CO2e)

1706410

Base year Scope 2 emissions covered by target (metric tons CO2e)

322020

Base year Scope 3, Category 1: Purchased goods and services emissions covered by target (metric tons CO2e)**Base year Scope 3, Category 2: Capital goods emissions covered by target (metric tons CO2e)****Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target (metric tons CO2e)****Base year Scope 3, Category 4: Upstream transportation and distribution emissions covered by target (metric tons CO2e)****Base year Scope 3, Category 5: Waste generated in operations emissions covered by target (metric tons CO2e)****Base year Scope 3, Category 6: Business travel emissions covered by target (metric tons CO2e)****Base year Scope 3, Category 7: Employee commuting emissions covered by target (metric tons CO2e)****Base year Scope 3, Category 8: Upstream leased assets emissions covered by target (metric tons CO2e)**

<Not Applicable>

Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target (metric tons CO2e)**Base year Scope 3, Category 10: Processing of sold products emissions covered by target (metric tons CO2e)**

<Not Applicable>

Base year Scope 3, Category 11: Use of sold products emissions covered by target (metric tons CO2e)**Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target (metric tons CO2e)****Base year Scope 3, Category 13: Downstream leased assets emissions covered by target (metric tons CO2e)****Base year Scope 3, Category 14: Franchises emissions covered by target (metric tons CO2e)**

<Not Applicable>

Base year Scope 3, Category 15: Investments emissions covered by target (metric tons CO2e)**Base year Scope 3, Other (upstream) emissions covered by target (metric tons CO2e)**

<Not Applicable>

Base year Scope 3, Other (downstream) emissions covered by target (metric tons CO2e)

<Not Applicable>

Base year total Scope 3 emissions covered by target (metric tons CO2e)

5031168

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)

7059598

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1

100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2

100

Base year Scope 3, Category 1: Purchased goods and services emissions covered by target as % of total base year emissions in Scope 3, Category 1: Purchased goods and services (metric tons CO2e)

Base year Scope 3, Category 2: Capital goods emissions covered by target as % of total base year emissions in Scope 3, Category 2: Capital goods (metric tons CO2e)	
Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target as % of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)	
Base year Scope 3, Category 4: Upstream transportation and distribution covered by target as % of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e)	
Base year Scope 3, Category 5: Waste generated in operations emissions covered by target as % of total base year emissions in Scope 3, Category 5: Waste generated in operations (metric tons CO2e)	
Base year Scope 3, Category 6: Business travel emissions covered by target as % of total base year emissions in Scope 3, Category 6: Business travel (metric tons CO2e)	
Base year Scope 3, Category 7: Employee commuting covered by target as % of total base year emissions in Scope 3, Category 7: Employee commuting (metric tons CO2e)	
Base year Scope 3, Category 8: Upstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 8: Upstream leased assets (metric tons CO2e)	
<Not Applicable>	
Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target as % of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e)	
Base year Scope 3, Category 10: Processing of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 10: Processing of sold products (metric tons CO2e)	
<Not Applicable>	
Base year Scope 3, Category 11: Use of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 11: Use of sold products (metric tons CO2e)	
Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e)	
Base year Scope 3, Category 13: Downstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 13: Downstream leased assets (metric tons CO2e)	
Base year Scope 3, Category 14: Franchises emissions covered by target as % of total base year emissions in Scope 3, Category 14: Franchises (metric tons CO2e)	
<Not Applicable>	
Base year Scope 3, Category 15: Investments emissions covered by target as % of total base year emissions in Scope 3, Category 15: Investments (metric tons CO2e)	
Base year Scope 3, Other (upstream) emissions covered by target as % of total base year emissions in Scope 3, Other (upstream) (metric tons CO2e)	
<Not Applicable>	
Base year Scope 3, Other (downstream) emissions covered by target as % of total base year emissions in Scope 3, Other (downstream) (metric tons CO2e)	
<Not Applicable>	
Base year total Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)	100
Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes	100
Target year	2040
Targeted reduction from base year (%)	100
Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]	0
Scope 1 emissions in reporting year covered by target (metric tons CO2e)	1424614
Scope 2 emissions in reporting year covered by target (metric tons CO2e)	242037
Scope 3, Category 1: Purchased goods and services emissions in reporting year covered by target (metric tons CO2e)	
Scope 3, Category 2: Capital goods emissions in reporting year covered by target (metric tons CO2e)	
Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions in reporting year covered by target (metric tons CO2e)	
Scope 3, Category 4: Upstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)	
Scope 3, Category 5: Waste generated in operations emissions in reporting year covered by target (metric tons CO2e)	
Scope 3, Category 6: Business travel emissions in reporting year covered by target (metric tons CO2e)	
Scope 3, Category 7: Employee commuting emissions in reporting year covered by target (metric tons CO2e)	
Scope 3, Category 8: Upstream leased assets emissions in reporting year covered by target (metric tons CO2e)	
<Not Applicable>	
Scope 3, Category 9: Downstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)	
Scope 3, Category 10: Processing of sold products emissions in reporting year covered by target (metric tons CO2e)	
<Not Applicable>	

Scope 3, Category 11: Use of sold products emissions in reporting year covered by target (metric tons CO2e)

Scope 3, Category 12: End-of-life treatment of sold products emissions in reporting year covered by target (metric tons CO2e)

Scope 3, Category 13: Downstream leased assets emissions in reporting year covered by target (metric tons CO2e)

Scope 3, Category 14: Franchises emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Category 15: Investments emissions in reporting year covered by target (metric tons CO2e)

Scope 3, Other (upstream) emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Scope 3, Other (downstream) emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Total Scope 3 emissions in reporting year covered by target (metric tons CO2e)

6616278

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)

8282929

Does this target cover any land-related emissions?

No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

% of target achieved relative to base year [auto-calculated]

-17.3286212614373

Target status in reporting year

Underway

Please explain target coverage and identify any exclusions

This target covers the whole Merck Group (operational control as specified in this questionnaire). In 2020/2021, Merck set itself a new set of climate goals. By 2030, we intend to lower our direct (Scope 1) and indirect (Scope 2) emissions by 50% (2020 baseline). Merck also commits to reduce scope 3 GHG emissions 52% per euro value added within the same timeframe. Both targets have been approved by the SBTi in May 2022.

By 2040, we intend to achieve climate neutral operations along our entire value chain. This target covers our Scope 1, 2 and 3 greenhouse gas emissions.

Plan for achieving target, and progress made to the end of the reporting year

Plan for achieving target:

At this time, we see three main levers to reduce our scope 1 and 2 emissions:

- Reduction of our process-related emissions
- Purchase of renewable electricity
- Improvements in energy efficiency/energy saving

With regard to our scope 3 emissions we see for instance these levers:

- Encourage decarbonization of value chain (e.g. Drive top tier 1 suppliers to switch from grid electricity to renewable electricity in production of raw materials)
- Reduction of emissions in transport sector (e.g. air to ocean freight)
- New innovative products with renewable raw materials or circularity
- Optimize product design to reduce emissions from packaging and raw material
- Encourage our customers to reduce their scope 1 emissions related to our products
- Reduce share of landfilled and incinerated waste in own operations

Progress made:

Merck's overall emissions increased by approx. 17% in 2022 compared to 2020. While our scope 1 and 2 emissions decreased by approx. 18%, our scope 3 emissions increased by approx. 32%.

The decrease in our scope 1 (approx. 16%) and 2 (approx. 25%) emissions was mainly triggered by improvement projects to reduce our process-related emissions and by a higher share of electricity from renewable sources.

The increase in scope 3 intensity was mainly caused by methodical reasons. Increasing prices of raw materials due to the strong inflation in 2022 etc. caused a strong increase of our Scope 3, category 1 and 2 emissions as we use a spent-based calculation approach.

Besides, we see an impact due to the coronavirus pandemic. There was an increase in air freight transportation causing higher scope 3, category 4 emissions as the demand in many of our Life Science products increased. Parallel, there was a shift from ocean to air freight due to sea transportation bottlenecks. We see as well an increase in our scope 3, category 6 emissions as business travel was possible again in 2022.

List the emissions reduction initiatives which contributed most to achieving this target

<Not Applicable>

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Is this a science-based target?

Yes, and this target has been approved by the Science Based Targets initiative

Target ambition

Other, please specify (Our Scope 1&2 target is 1.5°C aligned. Overall, our Scope 1,2&3 targets were approved by SBTi in May 2022.)

Year target was set

2022

Target coverage

Company-wide

Scope(s)

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Intensity metric

Metric tons CO2e per USD(\$) value-added

Base year

2020

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)**Intensity figure in base year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)****Intensity figure in base year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)****Intensity figure in base year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)****Intensity figure in base year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)****Intensity figure in base year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)****Intensity figure in base year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)****Intensity figure in base year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)**

<Not Applicable>

Intensity figure in base year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)**Intensity figure in base year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)**

<Not Applicable>

Intensity figure in base year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)**Intensity figure in base year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)****Intensity figure in base year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)****Intensity figure in base year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)**

<Not Applicable>

Intensity figure in base year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)**Intensity figure in base year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)**

<Not Applicable>

Intensity figure in base year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for total Scope 3 (metric tons CO2e per unit of activity)

0.00054

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)

0.00054

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure

<Not Applicable>

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 1: Purchased goods and services covered by this Scope 3, Category 1: Purchased goods and services intensity figure**% of total base year emissions in Scope 3, Category 2: Capital goods covered by this Scope 3, Category 2: Capital goods intensity figure****% of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) covered by this Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) intensity figure**

% of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution covered by this Scope 3, Category 4: Upstream transportation and distribution intensity figure

% of total base year emissions in Scope 3, Category 5: Waste generated in operations covered by this Scope 3, Category 5: Waste generated in operations intensity figure

% of total base year emissions in Scope 3, Category 6: Business travel covered by this Scope 3, Category 6: Business travel intensity figure

% of total base year emissions in Scope 3, Category 7: Employee commuting covered by this Scope 3, Category 7: Employee commuting intensity figure

% of total base year emissions in Scope 3, Category 8: Upstream leased assets covered by this Scope 3, Category 8: Upstream leased assets intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution covered by this Scope 3, Category 9: Downstream transportation and distribution intensity figure

% of total base year emissions in Scope 3, Category 10: Processing of sold products covered by this Scope 3, Category 10: Processing of sold products intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 11: Use of sold products covered by this Scope 3, Category 11: Use of sold products intensity figure

% of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products covered by this Scope 3, Category 12: End-of-life treatment of sold products intensity figure

% of total base year emissions in Scope 3, Category 13: Downstream leased assets covered by this Scope 3, Category 13: Downstream leased assets intensity figure

% of total base year emissions in Scope 3, Category 14: Franchises covered by this Scope 3, Category 14: Franchises intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 15: Investments covered by this Scope 3, Category 15: Investments intensity figure

% of total base year emissions in Scope 3, Other (upstream) covered by this Scope 3, Other (upstream) intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Other (downstream) covered by this Scope 3, Other (downstream) intensity figure
<Not Applicable>

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this total Scope 3 intensity figure
100

% of total base year emissions in all selected Scopes covered by this intensity figure
100

Target year
2030

Targeted reduction from base year (%)
52

Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]
0.0002592

% change anticipated in absolute Scope 1+2 emissions
0

% change anticipated in absolute Scope 3 emissions
-52

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for total Scope 3 (metric tons CO2e per unit of activity)

0.00057

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)

0.00057

Does this target cover any land-related emissions?

No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

% of target achieved relative to base year [auto-calculated]

-10.6837606837607

Target status in reporting year

Underway

Please explain target coverage and identify any exclusions

This target covers the whole Merck Group (operational control as specified in this questionnaire). In 2020/2021, Merck set itself a new set of climate goals. By 2030, we intend to lower our direct (Scope 1) and indirect (Scope 2) emissions by 50% (2020 baseline). Merck also commits to reduce scope 3 GHG emissions 52% per euro value added within the same timeframe. Both targets have been approved by the SBTi in May 2022.

By 2040, we intend to achieve climate neutral operations along our entire value chain. This target covers our Scope 1, 2 and 3 greenhouse gas emissions.

Plan for achieving target, and progress made to the end of the reporting year

Plan for achieving target:

At this time, we see for instance these levers to reduce our scope 3 emissions:

- Encourage decarbonization of value chain (e.g. Drive top tier 1 suppliers to switch from grid electricity to renewable electricity in production of raw materials)
- Reduction of emissions in transport sector (e.g. air to ocean freight)
- New innovative products with renewable raw materials or circularity
- Optimize product design to reduce emissions from packaging and raw material
- Encourage our customers to reduce their scope 1 emissions related to our products
- Reduce share of landfilled and incinerated waste in own operations

Progress made:

This goal was set up newly in the process of setting science-based targets in 2021/2022. The increase in scope 3 intensity was mainly caused by methodical reasons.

Increasing prices of raw materials due to the strong inflation in 2022 etc. caused a strong increase of our scope 3, category 1 and 2 emissions as we use a spent-based calculation approach.

Besides, we see an impact due to the coronavirus pandemic. There was an increase in air freight transportation causing higher scope 3, category 4 emissions as the demand in many of our Life Science products increased. Parallel, there was a shift from ocean to air freight due to sea transportation bottlenecks. We see as well an increase in our scope 3, category 6 emissions as business travel was possible again in 2022.

List the emissions reduction initiatives which contributed most to achieving this target

<Not Applicable>

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to increase low-carbon energy consumption or production

Other climate-related target(s)

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number

Low 1

Year target was set

2020

Target coverage

Company-wide

Target type: energy carrier

Electricity

Target type: activity

Consumption

Target type: energy source

Renewable energy source(s) only

Base year

2020

Consumption or production of selected energy carrier in base year (MWh)

945065

% share of low-carbon or renewable energy in base year

27

Target year

2030

% share of low-carbon or renewable energy in target year

80

% share of low-carbon or renewable energy in reporting year

47

% of target achieved relative to base year [auto-calculated]

37.7358490566038

Target status in reporting year

Underway

Is this target part of an emissions target?

This target is part of a set of emission targets. By 2030, we intend to lower our direct (Scope 1) and indirect (Scope 2) emissions by 50% (2020 baseline). This target was approved as a Science-Based Target by the SBTi in May 2022. [Abs1]

By 2040, we intend to achieve climate neutral operations along our entire value chain. This target covers our Scope 1, 2 and 3 greenhouse gas emissions. [Abs2]

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain target coverage and identify any exclusions

This target covers the whole Merck Group (operational control as specified in this questionnaire).

Plan for achieving target, and progress made to the end of the reporting year

Plan for achieving target:

Merck's renewable electricity strategy is to go continent-wise. After signing a 12-year Virtual Power Purchase Agreement (VPPA) with the Azure Sky Wind and Storage project in the US, the project went into commercial operation in May 2022. Furthermore, in 2022, we expanded our renewable energy commitment in the US through another VPPA (Liberty County Solar project, 40 MW) with a 16-year term. With these two deals, we cover 90% of the company's electricity consumption in the United States and 55% globally. We are covering the power needs of multiple South American sites (for example Argentina, Chile, Guatemala) through renewable energy certificates. The same applies to several of our sites in China. In line with our renewable energy strategy, we completed an assessment of the European renewable electricity markets to determine our best path forward. This assessment will guide our renewable electricity purchasing strategy in the coming years. We are currently in the process of selecting project developers to achieve our green electricity sourcing objective. Besides this, we are actively investigating in possible solutions for the APAC market.

Progress made:

In 2022, we reached a strong increase in the share of electricity from renewable sources. We sourced approx. 47% of our purchased electricity from renewable energies, meaning direct supply contracts and energy attribute certificates (2021: 30%, 2020: 27%). Scope 2 emissions decreased by approx. 25% compared to 2020.

List the actions which contributed most to achieving this target

<Not Applicable>

C4.2b

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number

Oth 1

Year target was set

2016

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Waste management	Other, please specify (Waste Scoring System: our waste streams are broken down into 5 categories by percentage: landfilling, thermal disposal, waste-to-energy, recycling, and prevention. This percentage is then multiplied by a factor per disposal method and added together.)
------------------	--

Target denominator (intensity targets only)

<Not Applicable>

Base year

2016

Figure or percentage in base year

443

Target year

2025

Figure or percentage in target year

421

Figure or percentage in reporting year

404

% of target achieved relative to base year [auto-calculated]

177.272727272727

Target status in reporting year

Underway

Is this target part of an emissions target?

No, but it supports our activities with regard to GHG emission reduction. We use the Merck Waste Score to systematically track the environmental footprint of our waste disposal activities. We are aiming to reduce this score by 5% by 2025 compared with 2016. By reducing the overall waste quantities and by disposing of existing waste in more environmentally friendly ways (more recycling, less landfilling etc.), this waste target helps to reduce our Scope 3, category 5 GHG emissions.

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain target coverage and identify any exclusions

This target covers the whole Merck Group (operational control as specified in this questionnaire).

Plan for achieving target, and progress made to the end of the reporting year

Plan for achieving target:

To achieve this goal, we continually examine our production processes and disposal methods to identify potential areas for improvement, an endeavour supported by the Environment, Health&Safety (EHS) units of the business sectors at each respective site. They regularly discuss best practices, share lessons learned across our sites, and drive the transition to greener disposal methods.

Progress made:

In 2022, we succeeded in reducing our total Waste Score by 8.8% relative to 2016 (target: 5%). In 2023, we started to develop a new waste goal.

List the actions which contributed most to achieving this target

<Not Applicable>

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	5	
To be implemented*	4	219
Implementation commenced*	29	4269
Implemented*	37	1638
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Energy efficiency in buildings	Heating, Ventilation and Air Conditioning (HVAC)
--------------------------------	--

Estimated annual CO2e savings (metric tonnes CO2e)

636

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

307000

Investment required (unit currency – as specified in C0.4)

1842000

Payback period

4-10 years

Estimated lifetime of the initiative

6-10 years

Comment

We do not track all the financial data for each and every project. Therefore, the investment needed was estimated via an average payback of six years. In total Merck completed many more energy efficiency and GHG emission reduction projects summing up to a minimum of 79.5 kilotons of GHG savings. The most impactful projects are multi-year projects of our Life Science and Electronics business sectors to eliminate process-related GHG emissions. Hereby, new contracts for the purchase of electricity from renewable sources are not considered.

Initiative category & Initiative type

Energy efficiency in buildings	Lighting
--------------------------------	----------

Estimated annual CO2e savings (metric tonnes CO2e)

27

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

8600

Investment required (unit currency – as specified in C0.4)

52000

Payback period

4-10 years

Estimated lifetime of the initiative

6-10 years

Comment

We do not track all the financial data for each and every project. Therefore, the investment needed was estimated via an average payback of six years. In total Merck completed many more energy efficiency and GHG emission reduction projects summing up to a minimum of 79.5 kilotons of GHG savings. The most impactful projects are multi-year projects of our Life Science and Electronics business sectors to eliminate process-related GHG emissions. Hereby, new contracts for the purchase of electricity from renewable sources are not considered.

Initiative category & Initiative type

Energy efficiency in production processes	Compressed air
---	----------------

Estimated annual CO2e savings (metric tonnes CO2e)

25

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

38000

Investment required (unit currency – as specified in C0.4)

228000

Payback period

4-10 years

Estimated lifetime of the initiative

6-10 years

Comment

We do not track all the financial data for each and every project. Therefore, the investment needed was estimated via an average payback of six years. In total Merck completed many more energy efficiency and GHG emission reduction projects summing up to a minimum of 79.5 kilotons of GHG savings. The most impactful projects are multi-year projects of our Life Science and Electronics business sectors to eliminate process-related GHG emissions. Hereby, new contracts for the purchase of electricity from renewable sources are not considered.

Initiative category & Initiative type

Energy efficiency in production processes	Process optimization
---	----------------------

Estimated annual CO2e savings (metric tonnes CO2e)

950

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

1121000

Investment required (unit currency – as specified in C0.4)

6726000

Payback period

4-10 years

Estimated lifetime of the initiative

6-10 years

Comment

We do not track all the financial data for each and every project. Therefore, the investment needed was estimated via an average payback of six years. In total Merck completed many more energy efficiency and GHG emission reduction projects summing up to a minimum of 79.5 kilotons of GHG savings. The most impactful projects are multi-year projects of our Life Science and Electronics business sectors to eliminate process-related GHG emissions. Hereby, new contracts for the purchase of electricity from renewable sources are not considered.

C4.3c**(C4.3c) What methods do you use to drive investment in emissions reduction activities?**

Method	Comment
Compliance with regulatory requirements/standards	Merck regularly checks on company and asset level regulatory requirements/standards on energy/energy efficiency or greenhouse gas emissions to be compliant.
Employee engagement	Our commitment to climate change mitigation is not restricted to the workplace - we encourage our employees to exhibit this through more sustainable living habits as well. We encourage our people to do their part to preserve the climate. Aside from regularly reporting on our Groupwide climate actions in our EHS newsletters, we also provide all employees with helpful information and tips on our Intranet. Our workforce in Darmstadt also has access to a "Jobticket", an annual public transit pass whose cost is partially covered by our company. Additionally, we also make available an online tool that helps our people arrange carpools. The mobility plans of our Healthcare sites Aubonne and Vevey include financial incentives for employees who commute by public transport, do car-sharing and use other environment-friendly options.
Internal incentives/recognition programs	We encourage our people to do their part to preserve the climate through helpful information and tips on our intranet. In our newsletter we regularly report on group-wide climate protection measures. Moreover, we support members of our workforce who are seeking greener modes of transportation: - At our German subsidiaries, we offer a subsidy of € 150 towards monthly lease payments to employees who opt for an electric company car. - At our German sites, we also encourage workers to use climate-friendly forms of transportation through "bike4me", a program enabling them to lease a bike at discounted rates with payments coming out of their pre-tax income. - In the United States, our Life Science employees can choose from several subsidies including up to US\$ 3,500 towards the purchase or lease of qualifying hybrid or electric vehicles, US\$ 1,000 towards the installation of solar photovoltaic systems or solar thermal collectors at their homes, and US\$ 100 towards the cost of a home energy assessment.
Dedicated budget for energy efficiency	As part of the energy and water efficiency program of our Life Science business sector, we rolled out new tools and governance structures in 2022 to help us assess projects to save energy and water. The energy and water efficiency program had a capital expenditure budget of € 4.6 million in 2022, which we increased to € 9.3 million in 2023. Our Healthcare business sector had a dedicated budget for sustainability-related projects of 10 million Euros.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?
No

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?
No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?
No

Name of organization(s) acquired, divested from, or merged with
<Not Applicable>

Details of structural change(s), including completion dates
<Not Applicable>

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	No	<Not Applicable>

C5.2

(C5.2) Provide your base year and base year emissions.

Scope 1

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
1706410

Comment

Scope 2 (location-based)

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
379173

Comment

Scope 2 (market-based)**Base year start**

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

322020

Comment**Scope 3 category 1: Purchased goods and services****Base year start**

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

3040372

Comment**Scope 3 category 2: Capital goods****Base year start**

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

293145

Comment**Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)****Base year start**

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

102079

Comment**Scope 3 category 4: Upstream transportation and distribution****Base year start**

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

264397

Comment**Scope 3 category 5: Waste generated in operations****Base year start**

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

84748

Comment**Scope 3 category 6: Business travel****Base year start**

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

32157

Comment

Scope 3 category 7: Employee commuting

Base year start

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

89571

Comment

Scope 3 category 8: Upstream leased assets

Base year start

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

0

Comment

Emissions from this Scope 3 category are not relevant for our scope 3 reporting because leased assets (e.g., rented offices, labs or warehouses) are integrated in the annual EHS data collection processes and are part of our scope 1 and 2 GHG inventory.

Scope 3 category 9: Downstream transportation and distribution

Base year start

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

8435

Comment

Scope 3 category 10: Processing of sold products

Base year start

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

0

Comment

We produce a huge variety of intermediate products for various purposes. Due to the range of potential applications and our customer structure, the related GHG emissions cannot be tracked in a practical fashion. Reliable figures are difficult to obtain. Here, we adhere to the recommendation of the "Guidance for Accounting and Reporting Corporate GHG Emissions in the Chemical Sector Value Chain of the WBCSD", which states that "Chemical companies are not required to report Scope 3, category 10 emissions, since reliable figures are difficult to obtain, due to the diverse application and customer structure".

Scope 3 category 11: Use of sold products

Base year start

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

1090814

Comment

Scope 3 category 12: End of life treatment of sold products

Base year start

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

23351

Comment

Scope 3 category 13: Downstream leased assets

Base year start

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

1678

Comment

Scope 3 category 14: Franchises

Base year start

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

0

Comment

This category is not relevant for us as we do not operate franchises, i.e., businesses operating under a license to sell or distribute another company's goods or services within a certain location.

Scope 3 category 15: Investments

Base year start

January 1 2020

Base year end

December 31 2020

Base year emissions (metric tons CO2e)

421

Comment

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

The Greenhouse Gas Protocol: Scope 2 Guidance

The Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Standard

C6. Emissions data

C6.1

(C6.1) What were your organization’s gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

1424614

Start date

<Not Applicable>

End date

<Not Applicable>

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

C6.3

(C6.3) What were your organization’s gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

377382

Scope 2, market-based (if applicable)

242037

Start date

<Not Applicable>

End date

<Not Applicable>

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1, Scope 2 or Scope 3 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1, Scope 2, or Scope 3 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source of excluded emissions

Company owned vehicles

Scope(s) or Scope 3 category(ies)

Scope 1

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

1

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

Combustion of fossil fuels in company owned vehicles is only partly considered. Merck accounts dispenses of gasoline and diesel at filling stations owned/controlled by Merck to have comparable and meaningful data. Collecting information on the energy consumption of all vehicles owned/controlled by Merck is not included due to lacking data availability.

Explain how you estimated the percentage of emissions this excluded source represents

Due to lacking availability emissions from company owned vehicles are excluded from reporting. This estimate was done by using the number of company owned vehicles, an average annual driving distance and an average emission factor. We estimate their share to be below 1%.

In total, we assume that the overall gap sums up to 2% as a maximum.

Source of excluded emissions

Small sites

Scope(s) or Scope 3 category(ies)

Scope 1

Scope 2 (market-based)

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

1

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

Merck's GHG accounting covers all production sites, (large) R&D sites, (large) sites with warehouses and (large) commercial affiliates (in total around 250 sites). A number of small commercial affiliates, labs, etc. have not been incorporated into Merck's EHS data management system because we assessed their GHG emissions as being minor in relation to the sites already included in our accounting. For one, integrating these sites requires a huge effort for GHG emissions that are minor in relation to the sites already included in our accounting. Secondly, very often these small sites are not able to provide the necessary data because they use rented offices and do not receive energy-related information from their landlord. In the past years, around 90% of Merck's emissions come from just 25 production sites. Therefore, these sites are in the main focus for the reduction of GHG emissions.

Explain how you estimated the percentage of emissions this excluded source represents

Not all small Merck sites are excluded from our GHG inventory. Data from these sites was used to extrapolate the gap. We estimate their share to be below 1%.

In total, we assume that the overall gap sums up to 2% as a maximum.

Source of excluded emissions

Thermal waste air purification

Scope(s) or Scope 3 category(ies)

Scope 1

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

1

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

Emissions of thermal waste air purification (e.g., from regenerative thermal oxidizers for the destruction of VOC's) are only partly included in the GHG inventory. GHG emissions from thermal waste air purification devices are caused by the fuels used to operate the device (mainly natural gas) and by the VOC's etc. that shall be destroyed in the device. The overwhelming share of GHG emissions comes from fuel usage and is included in the Scope 1 data. The negligible share from the destroyed VOC's is excluded as these data are not available.

Explain how you estimated the percentage of emissions this excluded source represents

The gap was estimated based on an assessment that has been conducted for one of our thermal waste air purification systems. Based on this we did an extrapolation. In total, we assume that the overall gap sums up to 2% as a maximum.

C6.5**(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.****Purchased goods and services****Evaluation status**

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

4199939

Emissions calculation methodology

Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 1 includes all upstream (i.e., cradle-to-gate) emissions from the extraction, production, and transportation of products purchased or acquired by the reporting company in the reporting year.

Emissions are calculated with a spend-based approach based on a procurement data management system (which integrates various ERP systems) and environmentally extended input-output (EEIO) data (source: US Environmentally-Extended Input-Output (USEEIO) Technical Content, United States Environmental Protection Agency, 2017). USEEIO provides emission factors on spend basis for different industrial sectors; regional variations are not considered.

The procurement system contains 95-97% of our total spend; i.e., there is a minor under-reporting. The gap is related to our smaller companies that either do not have a system in place or that have a very specific system setup (e.g., a small local ERP system).

In a next step, we are working on a weight-based approach to further increase accuracy. Final target is to use supplier-specific data to calculate these emissions.

Capital goods**Evaluation status**

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

387812

Emissions calculation methodology

Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 2 includes all upstream (i.e., cradle-to-gate) emissions from the extraction, production, and transportation of capital goods purchased or acquired by the reporting company in the reporting year.

As for category 1, emissions are calculated with a spend-based approach based on a procurement data management system (which integrates various ERP systems) and environmentally extended input-output (EEIO) data (source: US Environmentally-Extended Input-Output (USEEIO) Technical Content, United States Environmental Protection Agency, 2017). USEEIO provides emission factors on spend basis for different industrial sectors; regional variations are not considered.

The procurement system contains 95-97% of our total spend; i.e., there is a minor under-reporting. The gap is related to our smaller companies that either do not have a system in place or that have a very specific system setup (e.g., a small local ERP system).

In a next step, we are working on a weight-based approach to further increase accuracy. Final target is to use supplier-specific data to calculate these emissions.

Fuel-and-energy-related activities (not included in Scope 1 or 2)**Evaluation status**

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

121319

Emissions calculation methodology

Site-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 3 includes emissions related to the production of fuel and energy purchased and consumed by the reporting company in the reporting year that are not included in scope 1 or scope 2. Data on purchased and consumed fuels (mainly natural gas) and electricity, steam/heat and cold which are basis to calculate category 3 emissions are collected via our central EHS data management system.

To determine upstream emissions of purchased fuels, the fuel quantities are multiplied with well-to-tank emission factors (source: DEFRA, 2022, WTT – fuels).

Upstream emissions as well as transportation and distribution (T&D) losses of purchased heat/steam and cold are calculated by multiplying consumption figures with respective emission factors (source: DEFRA, 2022; WTT - heat and steam (WTT - heat and steam - District heat and steam) and respectively DEFRA, 2022, WTT - heat and steam (WTT - district heat & steam distribution, 5% loss) for losses. To calculate emissions from the generation and T&D of minor quantities of purchased cold the same emission factors are used as for heat/steam as no specific factors are available.

Upstream emissions from electricity purchased are determined by multiplying consumption figures with respective emission factors (source: DEFRA, 2022; WTT- overseas electricity (generation)). Hereby, electricity purchased from renewable sources is deducted (direct supply of renewable electricity as well as electricity covered by energy attribute certificates)

Electricity T&D losses are determined based on the quantities of electricity purchased and country-specific loss factors. Basis for country-specific electric power transmission and distribution losses: IEA 2022. Hereby, electricity purchased from renewable sources (direct supply of renewable electricity) is deducted.

Emissions from the generation of purchased electricity sold to end users is not relevant for us because we do not sell purchased electricity.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

319030

Emissions calculation methodology

Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 4 covers the transportation and distribution of products purchased by the reporting company in the reporting year between a company's tier 1 suppliers and its own operations (in vehicles and facilities not owned or controlled by the reporting company) as well as the transportation and distribution of services purchased by the reporting company in the reporting year, including inbound logistics, outbound logistics (e.g., of sold products), and transportation and distribution between a company's own facilities (in vehicles and facilities not owned or controlled by the reporting company).

To calculate emissions of these transportation categories, Merck uses a mixed approach. Primary data from Suppliers/Logistics Service Providers are integrated in reporting (i.e., CO₂ emissions are provided by the suppliers/Logistics Service Providers). If these data are not available a distance based approach using the freight weight and the distance transported (tkm) is used. Partly, a spend based approach is needed.

All relevant data and calculations are integrated in a Merck owned system. Various data sets from forwarders and own ERP data are uploaded to the tool and processed.

If no primary data is available a distance-based approach is taken. For sea freight the trade lanes are well known and do not change often. Therefore, the main legs are maintained in sea routing distance tables within the IT system (origin city, destination city plus corresponding port information). To determine the distances for the pre and post leg of sea transports and the other transport activities the geographical coordinates of the shipment origin and destination are determined via Google Geocoding API using city and zip code. Based on the determined distance, the transported weight and secondary data (emission factors from DEFRA, 2022) the CO₂e emissions are calculated.

For our Life Science business sector, no data on road transportations for the LATAM and Asia regions are available. Therefore, a spend-based approach is used to estimate these emissions.

Not included are shipments from suppliers where transportation is not paid by us. In case data is not yet available for the whole year appropriate extrapolations are conducted.

Waste generated in operations

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

84985

Emissions calculation methodology

Waste-type-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 5 includes emissions from third-party disposal and treatment of waste generated in facilities owned or controlled by us (including disposal of both solid waste and wastewater).

The calculation of emissions from waste generated in operations and disposed of by third parties is based on primary data from our manufacturing sites collected on an annual basis via our central EHS data management system. This data is split up into various waste types (e.g., solvent waste, soil waste) and waste disposal methods (e.g., waste-to-energy, landfill, recycling). Emission factors based on the carbon content of the waste were taken from the "Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain". The emission factor for external waste recycling/recovery and for external waste incineration with energy recovery is 0 kg CO₂e/metric ton carbon (it is assumed that recycling and energy recovery are attributed to the organization that uses the recycled material, or that uses the waste to generate energy); the emission factor for external waste incineration without energy recovery is 1 kg CO₂e/metric ton carbon; the emission factor for external landfill waste is 13 kg CO₂e/metric ton carbon. Carbon content factors are mainly taken from the "2006 IPCC Guidelines for National Greenhouse Gas Inventories" (e.g., solvent waste: 80%; construction and demolition waste: 24%; plastic waste: 75%). These data are then multiplied with each other. Emissions resulting from the transportation of waste materials are not taken into account.

To calculate greenhouse gas emissions from wastewater treatment in third party municipal or industrial wastewater treatment plants, we use primary data from our manufacturing sites, which is collected on an annual basis via our central EHS data management system. Wastewater quantities are multiplied by the DEFRA emission factor for water treatment.

Our waste and wastewater accounting mainly covers manufacturing sites. Pure warehouse sites, labs or commercial affiliates are only partially included in our waste reporting. Nevertheless, it is expected that the accounting covers more than 95% of our overall waste quantity. Additionally, it can be assumed that the majority of waste not taken into account is recycled (paper, cardboard, plastic, etc.).

Business travel

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

78171

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 6 includes emissions from the transportation of employees for business related activities in vehicles owned or operated by third parties, such as aircraft, trains, buses, and passenger cars.

Air travel: Based on our flight booking and billing processes, our payment solution service provider supplies detailed data of all flights booked. Greenhouse gas emissions are calculated by atmosfair (www.atmosfair.de), a recognized non-governmental organization dealing with climate protection with a focus on travel. The figure shows emissions including high altitudes effects (Radiation Forcing Index RFI of 2.7).

Rail travel: Rail travel is considered relevant in some European countries (e.g., Germany, France, Spain). In non-European countries, it is seen as rather negligible. At this time, data for rail travel is only available for Germany and is provided by Deutsche Bahn AG.

Rental cars: Emissions data is provided by our global rental car providers on an annual basis. Data on other means of transportation (e.g., trams, taxis and buses) are not available. Their impact on the overall emissions of Merck is expected to be negligible.

Hotel accommodation: Emissions from hotel stays are calculated based on the number of hotel stays per country (source: internal ERP system) and the DEFRA emission factors for hotel stays.

Employee commuting

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

99411

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 7 includes emissions from the transportation of employees between their homes and work.

There is no detailed data available on how our employees commute to work (means of transport), the distance they travel each day, and how often they commute to work per year. Therefore, the assessment of the GHG emissions is based on estimates and assumptions. For this, we use the "Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain" along with statistical data (source: "GLOBAL CONSUMER SURVEY", Statista). The Statista survey "Modes of transportation for commuting" provides percentages for different modes of transportation used for commuting for various countries.

The average number of trips per year and employee (440) as well as the average travel distance (30 km by car/taxi, 20 km by public transportation or motorbike) are taken from the "Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain". Emission factors for modes of transport are taken from DEFRA, 2022, Business travel-land.

To improve this calculation and to make it more Merck specific, we added some questions on commuting in our latest employee survey. Based on the results we will update our approach.

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO₂e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Category 8 includes emissions from the operation of assets that we lease and that are not already included in our scope 1 or scope 2 reporting.

Emissions from this category are not relevant for our scope 3 reporting because leased assets (e.g., rented offices, labs or warehouses) are integrated in the annual EHS data collection processes and are part of our scope 1 and 2 GHG inventory.

A number of small commercial affiliates, labs, etc. have not been incorporated into our EHS data management system. For one, integrating these sites requires a huge effort for GHG emissions that are minor in relation to the sites already included in our accounting. Secondly, very often these small sites are not able to provide the necessary data because they use rented offices and do not receive energy-related information from their landlord.

Downstream transportation and distribution

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

5900

Emissions calculation methodology

Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 9 covers transportation and distribution of products sold by the reporting company in the reporting year between the reporting company's operations and the end consumer (if not paid for by the reporting company), including retail and storage (in vehicles and facilities not owned or controlled by the reporting company).

To calculate emissions of this transportation category, Merck uses a mixed approach. Primary data from Suppliers/Logistics Service Providers are integrated in reporting (i.e., CO₂ emissions are provided by the suppliers/Logistics Service Providers). If these data are not available a distance based approach using the freight weight and the distance transported (tkm) is used.

All relevant data and calculations are integrated in a Merck owned system. Various data sets from forwarders and own ERP data are uploaded to the tool and processed.

If no primary data is available a distance-based approach is taken. For sea freight the trade lanes are well known and do not change often. Therefore, the main legs are maintained in sea routing distance tables within the IT system (origin city, destination city plus corresponding port information). To determine the distances for the pre and post leg of sea transports and the other transport activities the geographical coordinates of the shipment origin and destination are determined via Google Geocoding API using city and zip code. Based on the determined distance, the transported weight and secondary data (emission factors from DEFRA, 2022) the CO₂e emissions are calculated. In case data is not yet available for the whole year appropriate extrapolations are conducted.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO₂e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Category 10 includes emissions from the processing of sold intermediate products by third parties (e.g., manufacturers) subsequent to sale by the reporting company.

We produce a huge variety of intermediate products for various purposes. Due to the range of potential applications and our customer structure, the related GHG emissions cannot be tracked in a practical fashion. Reliable figures are difficult to obtain. Here, we adhere to the recommendation of the "Guidance for Accounting and Reporting Corporate GHG Emissions in the Chemical Sector Value Chain of the WBCSD", which states that "Chemical companies are not required to report Scope 3, category 10 emissions, since reliable figures are difficult to obtain, due to the diverse application and customer structure".

Use of sold products

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

1290024

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 11 includes emissions from the use of goods and services sold by the reporting company in the reporting year.

Internal expert assessments of our huge and very diverse product portfolio show that for our 'Greenhouse gases and products that contain or form greenhouse gases that are emitted during use' are the main driver of greenhouse gas emissions in this category. 'Products that directly consume energy (fuels or electricity) during use' contribute to a much lesser extent to the overall emissions. 'Fuels and feedstocks' as well as indirect use-phase emissions are not relevant for us. 'Indirect use-phase emissions' are optional and are not reported by us.

Electronics business sector: Among the broad Electronics product portfolio there are some specialty gases with high Global Warming Potential (GWP) that are emitted during use phase. Emissions are calculated based on technical expertise of internal experts on the percentage of gas quantities that escape the processes at our customers and abatement efficiency, sales volumes and global warming potentials (source: IPCC, 5th Assessment Report). Besides this, some product control devices consume electricity. Emissions of these devices are calculated based on runtime, average lifetime, and an estimated global emission factor. Other product lines are negligible or do not contribute at all to the overall emissions within this category.

Our Life Science business sector offers two product lines that consume electricity during use-phase. Emission calculation is based on product energy consumption (internal expert estimations), sales volumes, and respective emissions factors per country (source: IEA 2022). Sales data covers approx. 90-95% of sales (internal expert knowledge).

Our Healthcare business sector offers some battery-based injection devices that fall under category 11. Emissions are calculated based on energy consumption (expert estimate), sales volumes, and respective emission factors per country (source: IEA 2022).

Compared to other Scope 3 categories, the screening of the emissions in this category contains more uncertainties and is meant to provide a first indication of the impact of those Scope 3 emissions. Their impact cannot be estimated more precisely at this time. We are already working on improving the accuracy of these data.

End of life treatment of sold products

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

26394

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 12 includes emissions from the waste disposal and treatment of products sold by the reporting company (in the reporting year) at the end of their life.

Emissions from the disposal of sold products and respective packaging materials are calculated based on sales data, weight data of products and packaging material, statistical data on regional disposal methods and waste disposal emission factor data (source: DEFRA 2022).

For the Healthcare sector, the approach is slightly different than for the other business sectors. Here, only packaging material is considered as it is assumed that all healthcare products will be consumed by the customer/patient (e.g., drugs, medicine, etc.).

Compared to other Scope 3 categories, the screening of the emissions in this category contains more uncertainties and is meant to provide a first indication of the impact of those Scope 3 emissions. Their impact cannot be estimated more precisely at this time. We are already working on improving the accuracy of these data.

Downstream leased assets

Evaluation status

Not relevant, calculated

Emissions in reporting year (metric tons CO₂e)

1734

Emissions calculation methodology

Asset-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 13 includes emissions from the operation of assets that are owned by the reporting company (acting as lessor) and leased to other entities.

At Darmstadt, Germany, we are lessor of a few residential and commercial buildings.

Emissions are calculated based on building master data (e.g., energy demand from energy certificates) and respective emission factors.

To split up the energy demand into heating and electricity for residential and commercial buildings International Energy Agency (IEA) data is used. Emissions from heating energy are calculated by using the fuel type and DEFRA emission factors. Emissions from electricity demand is calculated by using the German grid emission factor provided by Bundesverband der Energie- und Wasserwirtschaft e.V (BDEW).

Franchises

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO₂e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Category 14 includes emissions from the operation of franchises.

This category is not relevant for us as we do not operate franchises, i.e., businesses operating under a license to sell or distribute another company's goods or services within a certain location. Out-licensing in the pharmaceutical sector is not regarded as franchising.

Investments

Evaluation status

Not relevant, calculated

Emissions in reporting year (metric tons CO₂e)

1559

Emissions calculation methodology

Investment-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Category 15 includes emissions from the operation of investments (including equity and debt investments and project finance) in the reporting year, not included in Scope 1 or Scope 2.

Emissions are calculated based on direct share of capital, respective annual revenue and environmentally extended input-output (EEIO) data (source: US Environmentally-Extended Input-Output (USEEIO) Technical Content, United States Environmental Protection Agency, 2017). USEEIO provides emission factors on spend basis for different industrial sectors; regional variations are not considered.

Other (upstream)

Evaluation status

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain

Other (downstream)

Evaluation status

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?
Yes

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	13285	

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.000075

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

1666651

Metric denominator

unit total revenue

Metric denominator: Unit total

22232000000

Scope 2 figure used

Market-based

% change from previous year

20

Direction of change

Decreased

Reason(s) for change

Change in renewable energy consumption
Other emissions reduction activities
Change in output
Change in revenue

Please explain

In 2022, we see a decrease in revenue-based emissions intensity which is caused by decreased emissions on the one hand side and an increased revenue on the other hand side. The decrease in emissions results from GHG emission reduction initiatives, an increased amount of renewable electricity purchased and less emissions due to reduced output.

Intensity figure

0.685

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

1666651

Metric denominator

Other, please specify (megawatt hour energy used (MWh))

Metric denominator: Unit total

2431568

Scope 2 figure used

Market-based

% change from previous year

9

Direction of change

Decreased

Reason(s) for change

Change in renewable energy consumption
Other emissions reduction activities
Change in output

Please explain

In 2022, we saw a decrease in energy-based emissions intensity which is caused by decreased emissions while there was a slight decrease in energy consumption. The decrease in emissions results from GHG emission reduction initiatives, an increased amount of renewable electricity purchased and less emissions due to reduced output.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?
Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	257986	IPCC Fifth Assessment Report (AR5 – 100 year) <i>Greenhouse gas emissions from energy use incl. CH4 and N2O</i>
HFCs	20254	IPCC Fifth Assessment Report (AR5 – 100 year) <i>Emissions from HVACs, chillers etc.</i>
PFCs	42421	IPCC Fifth Assessment Report (AR5 – 100 year) <i>Process-related emissions</i>
N2O	108024	IPCC Fifth Assessment Report (AR5 – 100 year) <i>Process-related emissions</i>
NF3	918356	IPCC Fifth Assessment Report (AR5 – 100 year) <i>Process-related emissions</i>
Other, please specify (CF4)	77573	Please select <i>Process-related emissions</i>

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/area/region.

Country/area/region	Scope 1 emissions (metric tons CO2e)
China	1493
France	10237
Germany	110801
Ireland	11794
Israel	1692
Italy	11059
Japan	9703
Republic of Korea	441509
Taiwan, China	118213
United States of America	679518
Other, please specify (Rest of world)	28595

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By activity

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Emissions from manufacturing sites	1386302
Emissions from non-manufacturing sites	38312

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/area/region.

Country/area/region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
China	33765	21143
France	9105	10063
Germany	29981	51127
Ireland	9112	0
Israel	7048	9682
Italy	5290	25
Japan	12521	12716
Republic of Korea	45188	45187
Taiwan, China	11037	10362
United States of America	177626	61851
Other, please specify (Rest of World)	36709	19881

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By activity

C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Emissions from manufacturing sites	295996	201629
Emissions from non-manufacturing sites	81386	40408

C7.7

(C7.7) Is your organization able to break down your emissions data for any of the subsidiaries included in your CDP response?

Yes

C7.7a

(C7.7a) Break down your gross Scope 1 and Scope 2 emissions by subsidiary.

Subsidiary name

Merck KGaA

Primary activity

Specialty chemicals

Select the unique identifier(s) you are able to provide for this subsidiary

Another unique identifier, please specify (Address)

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

Merck KGaA, Frankfurter Str. 250, 64293 Darmstadt

Scope 1 emissions (metric tons CO2e)

107969

Scope 2, location-based emissions (metric tons CO2e)

22676

Scope 2, market-based emissions (metric tons CO2e)

40029

Comment

Merck KGaA is the parent company of the Merck Group. The figures cover several sites, among them our headquarters at Darmstadt, the largest site of Merck (share at global energy consumption: 19% in 2022). Energy/GHG reporting is done on site level. This is the way how energy invoices are provided by energy suppliers. Often, there are multiple subsidiaries working at one site and one subsidiary regularly covers multiple sites. So, providing detailed data on subsidiary level is basically not possible with reasonable effort.

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change in emissions	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	67867	Decreased	3.68	Additional CO2e savings from the purchase of renewable electricity and from own photovoltaics in 2022"/Scope 1+2 Emissions 2021"*100: 67,867/1,843,255*100=3.68
Other emissions reduction activities	79500	Decreased	4.31	CO2e savings from reduction projects implemented in 2022"/Scope 1+2 Emissions 2021"*100: 79,500/1,843,255*100=4.31
Divestment		<Not Applicable>		
Acquisitions		<Not Applicable>		
Mergers		<Not Applicable>		
Change in output	29237	Decreased	1.59	Calculation 1 - increase because of organic growth/decline: Scope 1+2 Emissions 2021"-Scope 1+2 Emissions 2022"-CO2e savings from reduction projects implemented in 2022"-Additional CO2e savings from the purchase of renewable electricity and from own photovoltaics in 2022: 1,843,255-1,666,651-79,500-67,867=29,237 Calculation 2 - percent change because of organic growth/decline: Result from Calculation 1 (see above)"/Scope 1+2 Emissions 2022"*100: 29,237/1,843,255*100=1.59
Change in methodology		<Not Applicable>		
Change in boundary		<Not Applicable>		
Change in physical operating conditions		<Not Applicable>		
Unidentified		<Not Applicable>		
Other		<Not Applicable>		

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	Yes
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	Yes
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization’s energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	32398	1257691	1290089
Consumption of purchased or acquired electricity	<Not Applicable>	460873	523407	984280
Consumption of purchased or acquired heat	<Not Applicable>	0	152457	152457
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	0	1610	1610
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	3138	<Not Applicable>	3138
Total energy consumption	<Not Applicable>	496409	1935165	2431574

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	Yes
Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Sustainable biomass

Heating value
LHV

Total fuel MWh consumed by the organization
32398

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
32398

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment
Locally sourced certified forestry residues. Fuel is mainly used for generating heat.

Other biomass

Heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment
not applicable

Other renewable fuels (e.g. renewable hydrogen)

Heating value

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

not applicable

Coal

Heating value

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

not applicable

Oil

Heating value

LHV

Total fuel MWh consumed by the organization

49029

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Light fuel oil, diesel. Fuel is mainly used for the generation of heat/steam. Partly, light fuel oil/diesel is used to generate electricity in emergency generators as well as for transportation purposes.

Data on the share of the fuels used for the different purposes is not available. Due to the very high level of detail these data are not collected on Merck Group level although available on site level.

Gas

Heating value

LHV

Total fuel MWh consumed by the organization

1188182

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Natural gas is used to generate electricity, heat, steam and cooling. At several sites this is done via self-cogeneration and self-trigeneration.

Data on the share of the fuels used for the different purposes is not available. Due to the very high level of detail these data are not collected on Merck Group level although available on site level.

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value

LHV

Total fuel MWh consumed by the organization

20480

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Kerosene, LPG, biodiesel, gasoline. Fuels are mainly used to generate heat/steam.

Data on the share of the fuels used for the different purposes is not available. Due to the very high level of detail these data are not collected on Merck Group level although available on site level.

Total fuel

Heating value

LHV

Total fuel MWh consumed by the organization

1290089

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Data on the share of the fuels used for the different purposes is not available. Due to the very high level of detail these data are not collected on Merck Group level although available on site level.

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	99208	95988	3266	3138
Heat	260370	161933	0	0
Steam	0	0	0	0
Cooling	48222	46239	0	0

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in C6.3.

Country/area of low-carbon energy consumption

United States of America

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

143644

Tracking instrument used

US-REC

Country/area of origin (generation) of the low-carbon energy or energy attribute

United States of America

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2018

Comment

This is based on one single-source contract from Persimmon Creek Windfarm in Oklahoma.

Country/area of low-carbon energy consumption

United States of America

Sourcing method

Financial (virtual) power purchase agreement (VPPA)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

109404

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

United States of America

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2022

Comment

12-year Virtual Power Purchase Agreement (VPPA) with the Azure Sky Wind and Storage project. The project went into commercial operation in May 2022.

Country/area of low-carbon energy consumption

Switzerland

Sourcing method

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

Energy carrier

Electricity

Low-carbon technology type

Hydropower (capacity unknown)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

39564

Tracking instrument used

GO

Country/area of origin (generation) of the low-carbon energy or energy attribute

Switzerland

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

The Merck Group procures the "Wasser Schweiz" electricity product for its sites in Switzerland. This energy comes exclusively from ewz's own hydropower plants. ewz operates 22 hydropower plants in Switzerland. They were in operation between 1877 and 2021 and are being renovated or renewed on an ongoing basis. In 2022 40% of the overall purchase had to be covered by the "Wasser EU" electricity product as the "Wasser Schweiz" product was not available in sufficient quantities.

Country/area of low-carbon energy consumption

Switzerland

Sourcing method

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

Energy carrier

Electricity

Low-carbon technology type

Hydropower (capacity unknown)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

26376

Tracking instrument used

GO

Country/area of origin (generation) of the low-carbon energy or energy attribute

Norway

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

The Merck Group procures the "Wasser Schweiz" electricity product for its sites in Switzerland. This energy comes exclusively from ewz's own hydropower plants. ewz operates 22 hydropower plants in Switzerland. They were in operation between 1877 and 2021 and are being renovated or renewed on an ongoing basis. In 2022 40% of the overall purchase had to be covered by the "Wasser EU" electricity product as the "Wasser Schweiz" product was not available in sufficient quantities.

Country/area of low-carbon energy consumption

Italy

Sourcing method

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

Energy carrier

Electricity

Low-carbon technology type

Renewable energy mix, please specify (Wind, Sustainable biomass, Solar)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

19856

Tracking instrument used

GO

Country/area of origin (generation) of the low-carbon energy or energy attribute

Italy

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

Spain

Sourcing method

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

Energy carrier

Electricity

Low-carbon technology type

Solar

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

22611

Tracking instrument used

GO

Country/area of origin (generation) of the low-carbon energy or energy attribute

Spain

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2017

Comment

Country/area of low-carbon energy consumption

Ireland

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

34141

Tracking instrument used

No instrument used

Country/area of origin (generation) of the low-carbon energy or energy attribute

Ireland

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

Netherlands

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

3408

Tracking instrument used

No instrument used

Country/area of origin (generation) of the low-carbon energy or energy attribute

Netherlands

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

United Kingdom of Great Britain and Northern Ireland

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

16839

Tracking instrument used

No instrument used

Country/area of origin (generation) of the low-carbon energy or energy attribute

United Kingdom of Great Britain and Northern Ireland

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

Switzerland

Sourcing method

Purchase from an on-site installation owned by a third party (on-site PPA)

Energy carrier

Electricity

Low-carbon technology type

Solar

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

22

Tracking instrument used

No instrument used

Country/area of origin (generation) of the low-carbon energy or energy attribute

Switzerland

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2018

Comment

Country/area of low-carbon energy consumption

Brazil

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

16854

Tracking instrument used

I-REC

Country/area of origin (generation) of the low-carbon energy or energy attribute

Brazil

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2014

Comment

Country/area of low-carbon energy consumption

Argentina

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

710

Tracking instrument used

I-REC

Country/area of origin (generation) of the low-carbon energy or energy attribute

Argentina

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2019

Comment

Country/area of low-carbon energy consumption

Colombia

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Small hydropower (<25 MW)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

89

Tracking instrument used

I-REC

Country/area of origin (generation) of the low-carbon energy or energy attribute

Colombia

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2016

Comment

Country/area of low-carbon energy consumption

Ecuador

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Small hydropower (<25 MW)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

63

Tracking instrument used

I-REC

Country/area of origin (generation) of the low-carbon energy or energy attribute

Colombia

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2016

Comment

Country/area of low-carbon energy consumption

Australia

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Solar

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

74

Tracking instrument used

No instrument used

Country/area of origin (generation) of the low-carbon energy or energy attribute

Australia

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

Chile

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

816

Tracking instrument used

I-REC

Country/area of origin (generation) of the low-carbon energy or energy attribute

Chile

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2017

Comment

Country/area of low-carbon energy consumption

China

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Renewable energy mix, please specify (Solar, Wind)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

21996

Tracking instrument used

GEC

Country/area of origin (generation) of the low-carbon energy or energy attribute

China

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

Denmark

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

18

Tracking instrument used

No instrument used

Country/area of origin (generation) of the low-carbon energy or energy attribute

Denmark

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

Guatemala

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Small hydropower (<25 MW)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

259

Tracking instrument used

I-REC

Country/area of origin (generation) of the low-carbon energy or energy attribute

Guatemala

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2017

Comment

Country/area of low-carbon energy consumption

Indonesia

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Geothermal

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

200

Tracking instrument used

TIGR

Country/area of origin (generation) of the low-carbon energy or energy attribute

Indonesia

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

Mexico

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Solar

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

2800

Tracking instrument used

GO

Country/area of origin (generation) of the low-carbon energy or energy attribute

Mexico

Are you able to report the commissioning or re-powering year of the energy generation facility?

No

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

Peru

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Small hydropower (<25 MW)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

170

Tracking instrument used

I-REC

Country/area of origin (generation) of the low-carbon energy or energy attribute

Peru

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2012

Comment

Country/area of low-carbon energy consumption

Uruguay

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Wind

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

959

Tracking instrument used

I-REC

Country/area of origin (generation) of the low-carbon energy or energy attribute

Argentina

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2019

Comment

C8.2g

(C8.2g) Provide a breakdown by country/area of your non-fuel energy consumption in the reporting year.

Country/area

China

Consumption of purchased electricity (MWh)

48492

Consumption of self-generated electricity (MWh)

408

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

22354

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

71254

Country/area

France

Consumption of purchased electricity (MWh)

57410

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

36045

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

93455

Country/area

Germany

Consumption of purchased electricity (MWh)

81412

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

8708

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

90120

Country/area

Ireland

Consumption of purchased electricity (MWh)

34141

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

34141

Country/area

Israel

Consumption of purchased electricity (MWh)

15262

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

15262

Country/area

Italy

Consumption of purchased electricity (MWh)

19910

Consumption of self-generated electricity (MWh)

302

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

20212

Country/area

Japan

Consumption of purchased electricity (MWh)

26184

Consumption of self-generated electricity (MWh)

102

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

26286

Country/area

Republic of Korea

Consumption of purchased electricity (MWh)

98088

Consumption of self-generated electricity (MWh)

152

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

742

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

98982

Country/area

Taiwan, China

Consumption of purchased electricity (MWh)

20136

Consumption of self-generated electricity (MWh)

9

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

20145

Country/area

United States of America

Consumption of purchased electricity (MWh)

414535

Consumption of self-generated electricity (MWh)

363

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)
74270

Consumption of self-generated heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
489168

Country/area
Other, please specify (Rest of World)

Consumption of purchased electricity (MWh)
168710

Consumption of self-generated electricity (MWh)
1802

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)
11949

Consumption of self-generated heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
182461

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Merck Sustainability Report 2022.pdf

Merck CDP Verification Letter 2022 KPMG.pdf

Page/ section reference

Merck CDP Verification letter 2022 KPMG, see page 2

Merck Sustainability Report 2022, see pages 157, 202, 242-244

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Merck Sustainability Report 2022.pdf

Merck CDP Verification Letter 2022 KPMG.pdf

Page/ section reference

Merck CDP Verification letter 2022 KPMG, see page 2

Merck Sustainability Report 2022, see pages 157, 202, 242-244

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

Scope 2 approach

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Merck Sustainability Report 2022.pdf

Page/ section reference

Merck Sustainability Report 2022, see pages 157, 242-244

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category

Scope 3: Purchased goods and services
Scope 3: Capital goods
Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)
Scope 3: Upstream transportation and distribution
Scope 3: Waste generated in operations
Scope 3: Business travel
Scope 3: Employee commuting
Scope 3: Upstream leased assets
Scope 3: Investments
Scope 3: Downstream transportation and distribution
Scope 3: Processing of sold products
Scope 3: Use of sold products
Scope 3: End-of-life treatment of sold products
Scope 3: Downstream leased assets
Scope 3: Franchises

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Merck Sustainability Report 2022.pdf
Merck CDP Verification Letter 2022 KPMG.pdf

Page/section reference

Merck CDP Verification letter 2022 KPMG, see page 2
Merck Sustainability Report 2022, see pages 157-158, 203, 242-244

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C4. Targets and performance	Progress against emissions reduction target	ISAE3000	The progress against our GHG reduction target was published in Merck's Sustainability Report (p. 157) which was externally verified. See pages 242-244 of Merck's Sustainability Report for the Independent Assurance Report of the external verifier or the attached CDP Verification Letter. Merck Sustainability Report 2022.pdf Merck CDP Verification Letter 2022 KPMG.pdf
C6. Emissions data	Year on year change in emissions (Scope 1 and 2)	ISAE3000	Year on year change was published in Merck's Sustainability Report (p. 158, 202) which was externally verified. See pages 242-244 of Merck's Sustainability Report for the Independent Assurance Report of the external verifier or the attached CDP Verification Letter. Merck Sustainability Report 2022.pdf Merck CDP Verification Letter 2022 KPMG.pdf
C6. Emissions data	Year on year change in emissions (Scope 3)	ISAE3000	Year on year change was published in Merck's Sustainability Report (p. 203) which was externally verified. See pages 242-244 of Merck's Sustainability Report for the Independent Assurance Report of the external verifier or the attached CDP Verification Letter. Merck Sustainability Report 2022.pdf Merck CDP Verification Letter 2022 KPMG.pdf
C8. Energy	Energy consumption	ISAE3000	Energy consumption was published in Merck's Sustainability Report (p. 205) which was externally verified. See pages 242-244 of Merck's Sustainability Report for the Independent Assurance Report of the external verifier or the attached CDP Verification Letter. Merck Sustainability Report 2022.pdf Merck CDP Verification Letter 2022 KPMG.pdf

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?
Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.
EU ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

EU ETS	
% of Scope 1 emissions covered by the ETS	5.4
% of Scope 2 emissions covered by the ETS	0
Period start date	January 1 2022
Period end date	December 31 2022
Allowances allocated	21084
Allowances purchased	55552
Verified Scope 1 emissions in metric tons CO2e	76636
Verified Scope 2 emissions in metric tons CO2e	0
Details of ownership	Facilities we own and operate
Comment	

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

With power plants at the Darmstadt and Gernsheim sites in Germany, Merck is covered by the EU Emission Trading Scheme (EU ETS) launched Europe-wide in 2005. When issuing emissions certificates, the German Emissions Trading Authority (DEHSt) acknowledged our previous measures (the substitution of brown and black coal with gas) as "early actions". In the trading periods I and II (2006-2012) Merck benefited from free allowances. In the third trading period (2013-2020) new allocation rules were implemented. Merck's benefited from free allocation which was based on heat benchmarks and industrial exceptions. But Merck had to purchase first additional allowances. In the meantime, the allocation rules for the fourth period (2021-2030) have been established. A first application for free allocation (until 2025) has been submitted. A purchase will remain necessary in the next years.

There is still the risk of changes of the EU ETS in the coming years and still there are planning and investment uncertainties caused by such discussions and by possible regulatory changes within the next years.

In the context of the EU Green Deal the complete climate and energy legislation is being reviewed. There is currently a discussion on extending the scope of the EU-ETS, further restricting the free allocation up to let them expire from 2030 (in connection with the CBAM initiative).

Merck reacts on changes of the EU ETS in different ways. Scenario planning is used to estimate the possible financial impact by the changes in EU ETS. Merck observes tightly the discussions and decisions of the EU regarding the period until 2030 and beyond to adapt strategy if needed.

Besides this, we reduce the need for emissions certificates by implementing energy saving and greenhouse gas reduction projects. To have a solid basis to improve energy efficiency and to save energy, the two sites have been certified according to ISO 50001 Energy Management Systems already in 2012.

At the Darmstadt and Gernsheim sites, an energy strategy is currently developed to fulfil Merck's 2030 and 2040 climate goals and to align the energy supply even more closely with Merck's climate protection goals. The strategy combines different projects and technologies such as:

- Reduction of steam consumption: Replacing existing steam (where possible) with low temperature heat grids and the usage of heat pumps. Within this workstream one focus is on the Delta project (Sustainability Research Project) to use industrial waste heat and to connect the Merck industrial with local municipal heat grids.
- Usage of geothermal energy as a source for low temperature water grids and support of cooling in summer. This technology is in several projects under investigation and in other under construction.
- Several photovoltaic projects are being set up on the site. At the end of 2023 a capacity of more than 1 MW will be installed.

The focus of the strategy is to combine these different technologies adequately.

A special focus is also on energy-efficient new buildings: e.g., selection of highly efficient technologies, intensification of life cycle considerations, increased usage of renewable energies (photovoltaic, geothermal, solar thermal etc.) and the expansion of e-mobility. Overall, sustainability considerations are integrated in all major investments.

C11.2

(C11.2) Has your organization canceled any project-based carbon credits within the reporting year?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Type of internal carbon price

Shadow price

How the price is determined

Other, please specify (Mixed approach with the main contribution of: prices of allowances under an Emission Trading Scheme and benchmarking with peers)

Objective(s) for implementing this internal carbon price

Change internal behavior

Drive energy efficiency

Drive low-carbon investment

Identify and seize low-carbon opportunities

Stakeholder expectations

Stress test investments

Scope(s) covered

Scope 1

Scope 2

Pricing approach used – spatial variance

Uniform

Pricing approach used – temporal variance

Evolutionary

Indicate how you expect the price to change over time

Generally, we expect an increase of internal carbon price in the long-term but given the current global macro-economical conditions and market fluctuations, more short-term-price projections (e.g., EU ETS) are going along with significant risks.

Actual price(s) used – minimum (currency as specified in C0.4 per metric ton CO2e)

100

Actual price(s) used – maximum (currency as specified in C0.4 per metric ton CO2e)

100

Business decision-making processes this internal carbon price is applied to

Capital expenditure

Risk management

Mandatory enforcement of this internal carbon price within these business decision-making processes

Yes, for all decision-making processes

Explain how this internal carbon price has contributed to the implementation of your organization's climate commitments and/or climate transition plan

Merck introduced a sustainability evaluation ("Green business case" with CO2e emission measures and cost savings) using a shadow price of 100 Euro/t CO2e. This shadow price is mandatory since January 2022 for all investment projects larger than 10 million Euros. This shadow price has to be considered for the whole Merck Group irrespective of regional, sectoral, and/or operational context. Clear implication is to set a focus and sensitivity to the carbon emissions in large capital expenditure projects. Besides the carbon price we set more climate related guardrails in our investment process. Calculations on capital spending for GHG savings measures (photovoltaic, building insulation, etc.) must be treated differently than the overall business investment projects. This kind of projects are calculated with a GHG discount rate of 5.0%, the useful economic lifetime of the GHG investment is not limited to the investment projects' typical 10- or 15-year horizon. By applying those special measures exclusively for sustainability investments, we actively support and incentivize project teams to go for sustainable investments throughout our company.

The carbon price used for large investments helps to reach Merck's near-term GHG goals. Furthermore, because of the long-term impact of the investments covered by the carbon pricing the transition to carbon neutrality (Merck's long-term 2040 goal) is supported.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers/clients

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Engagement & incentivization (changing supplier behavior)

Details of engagement

Run an engagement campaign to educate suppliers about climate change

% of suppliers by number

2

% total procurement spend (direct and indirect)

58

% of supplier-related Scope 3 emissions as reported in C6.5

65

Rationale for the coverage of your engagement

Our Supplier Decarbonization Program is a key element contributing to reduce our emissions in line with our decision to join the Science Based Target initiative. Through the program, we aim to reduce greenhouse gas emissions associated with purchased goods and services as well as capital goods which sum up to 69% of our overall scope 3 emissions. We set up a cross-functional Supplier Decarbonization Program team within Group Procurement to define our strategy and drive the execution of a ten-year program plan. We approach our suppliers in waves and contacted the first target group in 2021 with a letter from our Chief Procurement Officer, information about our aspirations and a questionnaire to assess their current decarbonization status (e.g., share of renewables in energy consumption, availability of Product Carbon Footprints, monitoring of emissions, availability of reduction plans, setting of Science Based targets). Target of the first wave was to cover approx. 50% of Merck's scope 3, category 1 and 2 emissions. The selection of the first wave suppliers was therefore based on their GHG emissions. The resulting list was further refined by other supplier-specific data. Besides this, our sourcing managers collect relevant data from these suppliers in a global monitoring database. In 2022, we followed up with these suppliers on their status in 1:1 conversations, developing their sustainability efforts. In 2022, we expanded our supplier engagement efforts to cover another 15% (wave 1 +2 = 65%) of Merck's scope 3, category 1 and 2 emissions, by contacting the second wave.

Merck is as well active in the industry initiative Together for Sustainability (TfS). Through the TfS initiative, suppliers are assessed either based on information obtained during audits or based on self-reported and publicly accessible information provided by EcoVadis, an independent rating agency.

EcoVadis assesses suppliers from more than 160 countries and 200 sectors across the four categories of Environment, Labor and Human Rights, Ethics, and Sustainable Procurement. On top of the assessments, suppliers are also monitored through a 360-degree news watch. Through the TfS initiative alone, we have access to more than 1,700 valid scorecards on the assessment of our suppliers, more than 1,100 of which completed a new assessment or re-assessment in 2022.

Impact of engagement, including measures of success

Regarding the efforts that we pursued with our first wave suppliers, we clearly saw an improvement concerning our key leading questions (e.g., setting of Science Based targets), indicating that there is progress on our focus suppliers' decarbonization journey. We found that we are working together with many suppliers that are already on their own decarbonization journey. This applies mainly to larger companies. However, we have also seen improvements of suppliers that had not been as progressed when we started our engagement. For instance, 45% of our first wave suppliers were monitoring their GHG emissions in 2021, in 2022 an additional 18% made the crucial step and successfully started measuring their GHG emissions.

We measure the success based on the response rate of our customers, with a threshold of 75%. Based on a response rate of 75%, we evaluated the feedback with regard to our key questions (e.g., setting of Science Based targets).

Comment

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement & Details of engagement

Collaboration & innovation	Run a campaign to encourage innovation to reduce climate change impacts
----------------------------	---

% of customers by number

1

% of customer - related Scope 3 emissions as reported in C6.5

5

Please explain the rationale for selecting this group of customers and scope of engagement

Merck is in direct contact with many of its customers to further develop our products according to the needs of the clients. We have committed to industry leadership in sustainability and see the ability to drive sustainability into our business as a competitive advantage. We are currently focused on our key account customers that make up a bulk of volume and sales, while systematically driving this into our business and extending environmental benefit to all customers. The absolute number is relatively low as we have 1.6 million customers.

Impact of engagement, including measures of success

The Life Science business sector works across its business units to drive product-related sustainability, for instance by developing Design for Sustainability (DfS) and the DOZN™ tool to create more sustainable products for our customers.

Our proprietary, web-based tool, DOZN™, enables us to evaluate various products and/or processes to identify opportunities for sustainability improvements and provide transparency to our customers. DOZN™ industrializes the 12 Principles of Green Chemistry, a previously theoretical framework, and rates products in three stewardship categories of "Improved resource use", "Increased energy efficiency", and "Reduced human and environmental hazards". DOZN™ 2.0 is the tool's external interface, allowing our customers and other scientists to make more ecologically sustainable choices in their development processes. In 2022, we counted approximately ~1,500 users of DOZN™, a 20% increase from 2021, from 60 countries. Our DOZN™ paper has been cited more than 75 times and has had almost 18,000 views.

In 2022, we worked to establish new partnerships with universities in the United Kingdom and Germany in addition to our existing partnerships with universities in Canada, France, India, Switzerland, and the United States. These partnerships apply the DOZN™ tool in both virtual and in-lab chemistry curricula. Using DOZN™ in an academic setting yields many benefits.

Through our Design for Sustainability (DfS) framework, we follow a comprehensive approach to increasing the sustainability of our Life Science products. In 2022, we embedded DfS into our R&D process so that integration of sustainability is now required. The DfS development pillar provides our product developers with a systematic approach that enables them to analyze product impacts in terms of materials used, energy and emissions, water, packaging, usability, innovation, and circular economy as

well as supplier- and manufacturing-related issues. We have developed sustainability criteria on more than 45 points that are used to quantify a product's performance in each of these areas. When developing a new product, our aim is to improve on as many of these criteria scores as possible. We expect to add approximately 10,000 new greener alternative products to our offering by 2030 through the implementation of DFS in our product pipeline.

Type of engagement & Details of engagement

Collaboration & innovation	Run a campaign to encourage innovation to reduce climate change impacts
----------------------------	---

% of customers by number

1

% of customer - related Scope 3 emissions as reported in C6.5

50

Please explain the rationale for selecting this group of customers and scope of engagement

In the Electronics industry various chemicals are used, e.g., Etch and Clean gases. Several of them like NF3 show high greenhouse gas warming potentials (GWP) and are emitted as process-related scope 1 emissions at our customers. Low-GWP gases solutions help to reduce our customer's scope 1 emissions as well as Merck's scope 3 emissions. So, they are a meaningful step forward in support of both side's sustainability goals. We see this as an opportunity to expand our market share, further establishing Merck as an innovation partner. Only few customers are responsible for our overall Scope 3, cat. 11 GHG emissions.

Impact of engagement, including measures of success

Merck proactively reaches out to customers to join forces and support their sustainability goals. Within Merck sustainability strategy, our Electronics business sector has set a focus on the sustainability of its products. Reducing the environmental impact of products is an important part of the R&D process. Merck's Electronics R&D team has been actively engaging with one of our main customers to develop low-GWP gases solutions, starting with Etch and Clean gases.

Measures of success:

We wanted to conduct one project with one of our main customers as a starting point for the development of low-GWP gases solutions which was successfully done.

Description of the impact:

After a year of iterative collaboration, our customer is now testing an alternative low-GWP Etch gas from our lab to validate its process performance to replace a traditional, high global warming material. We are also collaborating on new, low emission gases for chamber cleaning applications.

Type of engagement & Details of engagement

Collaboration & innovation	Run a campaign to encourage innovation to reduce climate change impacts
----------------------------	---

% of customers by number

1

% of customer - related Scope 3 emissions as reported in C6.5

Please explain the rationale for selecting this group of customers and scope of engagement

Merck's Electronics business sector is in direct contact with many of its customers to further develop our products according to the needs of the clients. Hereby, sustainability and climate protection are important aspects. Nevertheless, we do not have any detailed data on the number of customers or similar.

Impact of engagement, including measures of success

Merck products significantly help our customers conserve energy and thus reduce their GHG emissions, help them to produce more energy-efficient products or to develop new technologies for renewable energy resources.

Our Electronics portfolio contains numerous examples of such products. Among others, we are developing innovative solutions for energy-efficient displays and lighting (based on Light Emitting Diodes (LED) and Organic Light Emitting Diodes (OLED) technologies).

Our liquid crystal window (LCW) technology helps to reduce the energy consumption of buildings.

We view sustainability as a competitive advantage, and we proactively engage in partnerships with our customers to collectively drive more sustainable value creation. We have complemented our product development process with the principle that it should avoid highly hazardous materials wherever possible. Therefore, we have also prioritized new green and innovative materials that deliver sustainable value to our customers.

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?

Yes, climate-related requirements are included in our supplier contracts

C12.2a

(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization's purchasing process and the compliance mechanisms in place.

Climate-related requirement

Implementation of emissions reduction initiatives

Description of this climate related requirement

As per Supplier Code of Conduct, Merck expects its suppliers to support the reduction of GHG emissions by ensuring that over time in accordance with the timelines communicated by Merck:

- An energy management system is established, for example in accordance with ISO 50001,
- Renewable energy is sourced, whereby a target of at least 80% of the total amount of purchased energy should be met,
- CO2 emissions are reduced during transport (e.g. green logistics) and in warehousing,
- Circular economy practices are established, e.g. reuse products and material, (e.g. packaging), and/or develop and introduce of recyclable products (e.g. cradle to cradle approach).

% suppliers by procurement spend that have to comply with this climate-related requirement

100

% suppliers by procurement spend in compliance with this climate-related requirement

7.9

Mechanisms for monitoring compliance with this climate-related requirement

Supplier self-assessment

Response to supplier non-compliance with this climate-related requirement

Retain and engage

Climate-related requirement

Climate-related disclosure through a public platform

Description of this climate related requirement

As per Supplier Code of Conduct, Merck expects its suppliers to support the reduction of GHG emissions by ensuring that over time in accordance with the timelines communicated by Merck:

- A GHG inventory is established in accordance with the GHG Protocol Corporate Accounting and Reporting Standard, covering own operations (Scope 1 and Scope 2) and the value chain (Scope 3).

% suppliers by procurement spend that have to comply with this climate-related requirement

100

% suppliers by procurement spend in compliance with this climate-related requirement

24

Mechanisms for monitoring compliance with this climate-related requirement

Supplier self-assessment

Response to supplier non-compliance with this climate-related requirement

Retain and engage

Climate-related requirement

Purchasing renewable energy

Description of this climate related requirement

As per Supplier Code of Conduct, Merck expects its suppliers to support the reduction of GHG emissions by ensuring that over time in accordance with the timelines communicated by Merck:

- An energy management system is established, for example in accordance with ISO 50001,
- Renewable energy is sourced, whereby a target of at least 80% of the total amount of purchased energy should be met.

% suppliers by procurement spend that have to comply with this climate-related requirement

100

% suppliers by procurement spend in compliance with this climate-related requirement

31.3

Mechanisms for monitoring compliance with this climate-related requirement

Supplier self-assessment

Response to supplier non-compliance with this climate-related requirement

Retain and engage

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

External engagement activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

Yes, we engage directly with policy makers

Yes, our membership of/engagement with trade associations could influence policy, law, or regulation that may impact the climate

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?

Yes

Attach commitment or position statement(s)

We want to do our part to preserve the climate and comply with the Paris Agreement on climate change. Therefore, we have set our own objectives:

By 2030, we intend to lower our direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions by 50% compared with 2020. We aim to achieve this mainly by reducing process-related emissions, implementing energy efficiency measures and purchasing more electricity from renewable sources.

In May 2022, this near-term goal for 2030 was approved by the Science Based Targets initiative (SBTi), which independently assesses and approves company targets based on its strict climate science criteria. With this confirmation, we are contributing to limiting global warming to 1.5 °C, thus complying with the requirements of the Paris Agreement.

We also aim to cover 80% of our purchased electricity with renewables by 2030.

Moreover, we aim to reduce our Scope 3 emissions across the entire value chain by 52% (per euro of gross profit) by 2030. This target was also approved by SBTi.

By 2040, we intend to have achieved climate-neutral operations throughout our entire value chain; this target covers our Scope 1, 2 and 3 emissions.

(Merck Annual Report 2022, p. 114).

Merck Annual Report 2022.pdf

Describe the process(es) your organization has in place to ensure that your external engagement activities are consistent with your climate commitments and/or climate transition plan

We actively participate in the political process and advocate our positions and views by engaging policymakers in a direct dialogue as well as through our work with industry coalitions. The major national and international industry associations in which we are members and also hold positions include (excerpt):

- The German Federation of Chemical Employers' Associations (BAVC)
- The European Federation of Pharmaceutical Industries and Associations (EFPIA)
- The International Federation of Pharmaceutical Manufacturers & Associations (IFPMA)
- The German Chemical Industry Association e. V. (VCI)
- The European Chemical Industry Council (Cefic)
- National Association of Manufacturers (NAM)
- United States Chamber of Commerce (USCC)
- Association of International Chemical Manufacturers (AICM)

For a list, please see our entry at the Lobbyregister: [https://www.lobbyregister.bundestag.de/suche/R001503/22142?](https://www.lobbyregister.bundestag.de/suche/R001503/22142?backUrl=%2Fsuche%3Fq%3Dmerck%26pageSize%3D10%26filter%255BactiveLobbyist%255D%255Btrue%255D%3Dtrue%26sort%3DRELEVANCE_DESC)

[backUrl=%2Fsuche%3Fq%3Dmerck%26pageSize%3D10%26filter%255BactiveLobbyist%255D%255Btrue%255D%3Dtrue%26sort%3DRELEVANCE_DESC](https://www.lobbyregister.bundestag.de/suche/R001503/22142?backUrl=%2Fsuche%3Fq%3Dmerck%26pageSize%3D10%26filter%255BactiveLobbyist%255D%255Btrue%255D%3Dtrue%26sort%3DRELEVANCE_DESC)

And our registry entry at the EU Transparency register:

<https://ec.europa.eu/transparencyregister/public/consultation/displaylobbyist.do?id=49654992078-52>

Merck's engagement activities are mainly driven by our Group function Corporate Affairs and by technical Merck experts working in the associations. This group is well aware of Merck's overall position on climate change (sustainability strategy, targets etc.). Information about Merck's climate strategy etc. is shared among all employees via different means (e.g., intranet, webinars, townhall meetings of the Board). Employees involved in advocacy activities are often deeply involved in our climate action program as well. By this, consistency between Merck's strategy and our advocacy activities is ensured.

Our interactions with actors in the political sphere focus on political dialogue, information exchange and open and transparent knowledge sharing. Our guidelines stipulate that our interactions and contributions must comply with all applicable laws and must never aim to inappropriately influence or compensate officials for political favors. Even if permitted by local law, we do not make contributions in the form of donations to or sponsorships of political parties or related organizations. Furthermore, we do not make donations to or sponsor holders of public office or candidates for such, nor do we make other types of financial contributions.

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

C12.3a

(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?

Specify the policy, law, or regulation on which your organization is engaging with policy makers

Various: EU Emission Trading Scheme (EU ETS), Carbon Border Adjustment Mechanism (CBAM), EU Green Deal, ECHA PFAS restriction proposal, PFAS legislation and regulation at the state and federal level (US), UWWD Urban Waste Water Directive (EU), EU electricity market design, Green Deal Industrial Plan, Net Zero Industry Act, Free Trade Agreements

Category of policy, law, or regulation that may impact the climate

Carbon pricing, taxes, and subsidies

Focus area of policy, law, or regulation that may impact the climate

Carbon taxes

Emissions trading schemes

Other, please specify (Funding for net zero technologies, waste management, air and water quality regulations)

Policy, law, or regulation geographic coverage

Global

Country/area/region the policy, law, or regulation applies to

<Not Applicable>

Your organization's position on the policy, law, or regulation

Support with minor exceptions

Description of engagement with policy makers

Sustainability (and hence climate) is a key priority of Merck. When addressing policy-makers in personal meetings this topic is almost always briefly outlined. We see our commitment and activities in sustainability as a competitive advantage and advocate for it.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

The allocation of ETS certificates should reflect the real situation and a reasonable (though ambitious) reduction of certificates in a level-playing field should be ensured.

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?

<Not Applicable>

C12.3b

(C12.3b) Provide details of the trade associations your organization is a member of, or engages with, which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association

European Chemical Industry Council (CEFIC)

Is your organization's position on climate change policy consistent with theirs?

Consistent

Has your organization attempted to influence their position in the reporting year?

Yes, we publicly promoted their current position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position

Across industries – from health, hygiene, construction and mobility to agriculture and energy supply, the chemical industry has a crucial role to play in this transition as it enables the transformation required.

Building on the Responsible Care programme and other sustainability initiatives, Cefic and its members have developed a Sustainability Charter and agreed on a SDG roadmap to foster innovation and deliver on sustainability goals, aligned to Cefic's Sustainable Development Vision. This vision translates how the European chemical industry can contribute to improving the living of over nine billion people by 2050, within the planetary boundaries.

Cefic and its members focus resources in the four critical areas to progress sustainable development:

- Enabling transition to a low carbon economy,
- Driving resource efficiency across global value chains and our operations,
- Promoting the adoption of circular economy principles to prevent waste, achieve low-carbon economy and enhance resource efficiency,
- Preventing harm to humans and the environment throughout the entire life cycle"

See: <https://cefic.org/a-solution-provider-for-sustainability/>

CEFIC statement (<https://cefic.org/policy-matters/chemical-industry-green-deal/how-can-europes-chemical-industry-help-deliver-on-the-green-deal/>):

"We support the Paris Climate Agreement and a strong action on climate change in line with the scientific advice provided by the Intergovernmental Panel on Climate Change (IPCC). Cefic also supports the European Green Deal and Europe's ambition to become climate neutral by 2050 and the European chemical industry has the ambition to become climate neutral by 2050. Reaching this goal will only be possible with the help of climate-neutral and circular economy solutions developed by our industry. We want to see Europe become a global innovation hub and a hotspot for investments into breakthrough climate-neutral and circular technologies. Yet the challenge we face is immense – with only 30 years left for the European society and industry to implement the necessary massive changes in energy transition and business models."

Our own position is in line with the CEFIC position.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)

Describe the aim of your organization's funding

<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Trade association

German Chemical Industry Association (VCI)

Is your organization's position on climate change policy consistent with theirs?

Consistent

Has your organization attempted to influence their position in the reporting year?

Yes, we publicly promoted their current position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position

The chemical and pharmaceutical industry in Germany has set itself the goal of becoming greenhouse gas neutral.

To find ways and solutions, the Association of German Engineers (VDI) and the German Chemical Industry Association (VCI) launched the Chemistry4Climate platform in May 2021.

In total, more than 80 stakeholders from industry, politics and civil society are represented at C4C. The participating companies come from the chemical, energy, waste management, plant construction buildings and transport sectors, as well as other energy-intensive industries. The German Federal Ministry of Economics and Climate Protection (BMWK) supports the work of the platform.

With the VCI Roadmap 2050 from fall 2019, the German chemical industry had already analyzed whether, and if so how, the path to a greenhouse gas-neutral chemical industry is possible. Technically, it is possible, but it is linked to numerous prerequisites. First and foremost, large amounts of renewable electricity at competitive prices are needed, as well as sufficient availability of green hydrogen. Furthermore, new sources of carbon for material use must be mobilized when fossil carriers are largely eliminated. Only then will the investments in the new technologies materialize.

See: <https://www.vci.de/themen/energie-klima/klimaschutz/ueber-chemistry4climate-klimaschutzplattform.jsp>

Our own position is in line with the VCI position.

Generally, the chemical and pharmaceutical industry has long seen sustainability as an obligation to current and future generations - and as a strategy for the future in which economic success is linked to social justice and ecological responsibility.

In the joint sustainability initiative Chemie³ of VCI, IG BCE and BAVC, the chemical industry is working united to anchor the principle of sustainability as a guiding principle.

The VCI represents the economic policy interests of around 1,700 chemical and pharmaceutical companies in Germany vis-à-vis politicians and society, public authorities, other sectors of industry, the scientific community and the media. The chemical and pharmaceutical industry is affected by numerous laws, rules and regulations. These affect the everyday lives of our member companies and are relevant to their competitiveness. That is why the VCI participates in the political and social discussions on the economic framework conditions and pay

See: <https://www.vci.de/themen/nachhaltigkeit/uebersicht.jsp>

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)**Describe the aim of your organization's funding**

<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Trade association

Federation of German Industries (BDI)

Is your organization's position on climate change policy consistent with theirs?

Consistent

Has your organization attempted to influence their position in the reporting year?

Yes, we publicly promoted their current position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position

The BDI is the umbrella organization of German industry and industry-related service providers. 39 industry associations, more than 100,000 companies with around eight million employees in Germany and 15 state representatives make us the voice of German industry.

Purpose of the BDI: We work for a modern, sustainable and successful industry in Germany, Europe and the world.

German industry supports the policy objective of promoting the sustainable use of natural resources while minimising harmful environmental and climate impacts, and has already been making a decisive contribution to increasingly efficient use of natural resources for many decades with innovative technologies and products.

The BDI's positions on sustainability: A high-performance industry is not sustainable without an intact environment. Environmental policy is therefore location policy. For decades, German industry has been making a decisive contribution to the increasingly efficient use of natural resources with innovative technologies and products.

<https://bdi.eu/umwelt-und-nachhaltigkeit>

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)**Describe the aim of your organization's funding**

<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

Merck Annual Report 2022.pdf

Page/Section reference

Annual Report Merck 2022; see pages 100, 114-116

Content elements

- Governance
- Strategy
- Risks & opportunities
- Emissions figures
- Emission targets
- Other metrics

Comment

Publication

In voluntary sustainability report

Status

Complete

Attach the document

Merck Sustainability Report 2022.pdf

Page/Section reference

Merck Sustainability Report 2022, see pages 15, 156-162, 202-203, 205-206, 242-244

Content elements

- Governance
- Strategy
- Risks & opportunities
- Emissions figures
- Emission targets
- Other metrics

Comment

C12.5

(C12.5) Indicate the collaborative frameworks, initiatives and/or commitments related to environmental issues for which you are a signatory/member.

	Environmental collaborative framework, initiative and/or commitment	Describe your organization's role within each framework, initiative and/or commitment
Row 1	UN Global Compact Other, please specify (Responsible Care® Global Charter, Together for Sustainability (TfS), Pharmaceutical Supply Chain Initiative (PSCI), Initiative Chemie3)	We support the following responsible governance initiatives: • We have been a participant in the United Nations Global Compact since 2005 and are committed to complying with its principles. Within the UN Global Compact Network Germany, we are a member of the Climate and Business & Human Rights Peer Learning Groups. In this context, we discuss challenges, current issues, experiences, and successful approaches with other companies. • As a signatory to the chemical industry's Responsible Care® Global Charter, we voluntarily go above and beyond what is required by law and have adopted mandatory standards for product responsibility, environmental impact mitigation and health and safety. • As a member of the Together for Sustainability (TfS) network, we are dedicated to improving the supply chain with respect to environmental, compliance and social standards. In 2022, we collaborated closely with member companies in TfS workstreams focusing on sustainability capacity building and supplier decarbonization. We supported the development of a capability-building concept and deployed the TfS Academy. This training platform offers sourcing managers, interested employees and suppliers of TfS member companies 165 courses in up to nine languages on topics such as sustainable procurement, environment, health and safety, as well as labor and human rights. We also contributed to several best practice sharing and collaboration formats such as the TfS Talks as well as TfS Coordinator Roundtable. Furthermore, we supported the development and launch of the TfS Product Carbon Footprint (PCF) Guideline, which harmonizes PCF calculation methodology across the industry, and led the development of decarbonization training materials for TfS member companies and their suppliers. • We are a member of the Pharmaceutical Supply Chain Initiative (PSCI), which aims to continuously improve health, safety and environmental aspects throughout the supply chain. • We are also a member of Initiative Chemie3, a collaboration between the German Chemical Industry Association (VCI), the German Employers' Federation of the Chemical Industry (BAVC), and the German Mining, Chemical and Energy Industrial Union (IG BCE). The partners involved this globally unique alliance seek to make sustainability a core part of the chemical industry's guiding principles and to jointly drive the sector's position within the German economy as a key contributor to sustainable development.

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	No, but we plan to have both within the next two years	<Not Applicable>	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have made public commitments only	Other, please specify (Nagoya Protocol, commitment to follow Convention on Biological Diversity (CBD) – Global Biodiversity Framework)	<Not Applicable>

C15.3

(C15.3) Does your organization assess the impacts and dependencies of its value chain on biodiversity?

Impacts on biodiversity

Indicate whether your organization undertakes this type of assessment

Yes

Value chain stage(s) covered

Direct operations

Portfolio activity

<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity

IBAT – Integrated Biodiversity Assessment Tool

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)

Currently we are analyzing our site activities. We aim to develop Biodiversity Site Profiles based on IBAT data. Furthermore, we published an internal guideline “Convention on Biological Diversity”.

Dependencies on biodiversity

Indicate whether your organization undertakes this type of assessment

Yes

Value chain stage(s) covered

Direct operations

Portfolio activity

<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity

Other, please specify (Project with consulting company)

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)

Project with consulting company to have a basis for further actions.

C15.4

(C15.4) Does your organization have activities located in or near to biodiversity- sensitive areas in the reporting year?

Not assessed

C15.5

(C15.5) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Other, please specify (Currently we are analyzing our site activities using external consulting support. We aim to develop Biodiversity Site Profiles based on IBAT data. Furthermore, we published an internal guideline “Convention on Biological Diversity”).

C15.6

(C15.6) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	No	Please select

C15.7

(C15.7) Have you published information about your organization’s response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Other, please specify (Part of materiality analysis)	p. 33 Merck Sustainability Report 2022.pdf

C16. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Member of the Executive Board, CEO	Director on board

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

Sustainable supply chain management

Our company procures many raw and packaging materials, technical products, components, and services from around the world. We aim to promote supply chain stability while providing our customers with high quality products and services. We expect our suppliers to share our ethical, social and compliance standards and apply these within their own supply chains.

The total value of the goods and services we purchased in 2022 from approximately 54,000 suppliers in more than 140 countries amounted to around € 10.2 billion, compared with approximately € 8.6 billion in 2021, representing an increase of 18.5%. Of these (including R&D services), we purchased 30% from suppliers based in North America, 43% from suppliers based in Europe, 20% from suppliers based in the Asia-Pacific region, 1% from suppliers in the Middle East and Africa, and 2% from suppliers in Latin America.

With our supplier management endeavours, we aim for compliance with fundamental environmental and social standards in addition to high quality, reliable delivery and competitive prices. Therefore, we have introduced relevant strategies, processes and guidelines to prevent violations of supply chain standards and continuously improving our sustainability performance.

To achieve our sustainability goals, our Group Procurement team is working closely with our suppliers. We aim to create transparency in all our sourcing regions and fully integrate sustainability into all our value chains. To this end, we have defined two key indicators to measure our journey towards increasing this transparency by evaluating the sustainability performance of our relevant suppliers with valid sustainability assessments. Our definition of valid sustainability assessment includes assessments carried out over the last three years and performed by a reliable, approved source.

We view our approach to supply chain sustainability as a journey and continuously work to improve and develop our policies and processes. While doing so, we consider all applicable legal requirements and initiate corresponding measures where necessary. For this purpose, in 2022, we implemented measures to operate compliant with the German Supply Chain Due Diligence Act. Among other things, the Head of Corporate Sustainability, Quality and Trade Compliance has been appointed as Human Rights Officer.

We expect all our suppliers and service providers to comply with our environmental and social standards, which are primarily derived from the core labor standards of the International Labour Organization (ILO) and the UN Global Compact. We expect our suppliers to ensure that their subcontractors respect the same rules. In the reporting year, we have developed a Supplier Code of Conduct which details our expectations towards suppliers and business partners regarding human rights, health and safety, business integrity, environmental protection, continuous improvement, and management of their respective suppliers more comprehensively. It replaces our Responsible Sourcing Principles as of January 2023.

Our Responsible Minerals Sourcing Charter demonstrates our commitment to responsible sourcing of minerals from conflict-affected and high-risk areas. It applies to all our legal entities and subsidiaries worldwide. The charter complements the requirements set out in our Supplier Code of Conduct.

To ensure that we work based on industry standards and can rely on comparable data analytics and expert analysis, we collaborate with our peer companies in industry initiatives. For example, we are a member of Together for Sustainability (TfS), the Pharma Supply Chain Initiative (PSCI), the Responsible Mica Initiative, and the Responsible Minerals Initiative (RMI).

Supplier Decarbonization Program

Our Supplier Decarbonization Program is a key element of achieving our Science Based Target. Our cross-functional program team within Group Procurement is driving the execution of a ten-year program as part of the decarbonization strategy that was defined in 2021. In 2022, we continued to provide training sessions and materials for procurement managers and sourcing teams and engaged further with suppliers by sharing information about our climate targets. Follow-up discussions were again held regarding the supplier decarbonization questionnaire to assess the current decarbonization status and progress made since last year. This allows our sourcing managers to collate relevant supplier data in a global monitoring database.

We have also developed an automated carbon accounting tool to manage the large quantities of data on the CO2 emissions of our suppliers. It has been available since the beginning of 2022 and we will continue adding new functionalities in the coming years.

For further details, please see our Sustainability Report 2022 (<https://www.merckgroup.com/en/sustainability-report/2022/>).

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	22232000000

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

Requesting member

Altria Group, Inc.

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

43

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

Merck tracks both Scope 1 and Scope 2 emissions from all its manufacturing sites as well as from the most relevant R&D sites, sites with warehouses and commercial affiliates (in total more than 200 sites). We made huge progress in overall reporting of Scope 3 emissions in the past two years and are now able to report on all 15 categories. Projects are ongoing to improve data quality (e.g., switch from a spend-based approach to a weight-based approach to calculate scope 3, category 1 and 2 emissions).

In its Healthcare, Life Science and Electronics business sectors, Merck offers more than 300,000 products. Allocation of Scope 1, Scope 2 and Scope 3 emissions to specific products by breaking down site-related or other emissions is currently not possible because very often a single manufacturing site or even a single plant/factory is engaged in the production of a variety of intermediates, products or product groups from multiple business sectors at any given time. Also, most customers purchase multiple products that span across various manufacturing sites, making identification of GHG emissions specific to one customer even more complex.

In 2022 we have started a pilot project to implement an IT tool for calculating portfolio product carbon footprints.

To ensure that we work based on industry standards and can rely on comparable data analytics and expert analysis, we collaborate with our peer companies in industry initiatives. For example, we are a member of Together for Sustainability (TfS). In 2022, we supported the development and launch of the TfS Product Carbon Footprint (PCF) Guideline, which harmonizes PCF calculation methodology across the industry, and led the development of decarbonization training materials for TfS member companies and their suppliers.

This will be the basis for our way forward with regard to processes and tools for product carbon footprinting.

Requesting member

Altria Group, Inc.

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

37

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Altria Group, Inc.

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

814

Uncertainty (±%)

30

Major sources of emissions

Our scope 3 reporting covers all 15 categories. With a share of approx. 60%, emissions from Purchased goods and services (cat. 1) are the most relevant contributor to our overall scope 3 emissions, followed by emissions from the Use of sold products (cat. 11; 20%). Some categories like Processing of sold products (cat. 10), Downstream leased assets (cat. 13), Franchises (cat. 14) or Investments (cat. 15) are not applicable for Merck or negligible. Cat. 8 emissions from upstream leased assets are included in Scope 1&2 emissions.

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Ambev S.A

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

27

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Ambev S.A

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

23

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Ambev S.A

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

508

Uncertainty (±%)

30

Major sources of emissions

Our scope 3 reporting covers all 15 categories. With a share of approx. 60%, emissions from Purchased goods and services (cat. 1) are the most relevant contributor to our overall scope 3 emissions, followed by emissions from the Use of sold products (cat. 11; 20%). Some categories like Processing of sold products (cat. 10), Downstream leased assets (cat. 13), Franchises (cat. 14) or Investments (cat. 15) are not applicable for Merck or negligible. Cat. 8 emissions from upstream leased assets are included in Scope 1&2 emissions.

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

AstraZeneca

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2485

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

AstraZeneca

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1059

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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This will be the basis for our way forward with regard to processes and tools for product carbon footprinting.

Requesting member

AstraZeneca

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services
Category 2: Capital goods
Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)
Category 4: Upstream transportation and distribution
Category 5: Waste generated in operations
Category 6: Business travel
Category 7: Employee commuting
Category 9: Downstream transportation and distribution

Category 11: Use of sold products
Category 12: End-of-life treatment of sold products
Category 13: Downstream leased assets
Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

23297

Uncertainty (±%)

30

Major sources of emissions

Our scope 3 reporting covers all 15 categories. With a share of approx. 60%, emissions from Purchased goods and services (cat. 1) are the most relevant contributor to our overall scope 3 emissions, followed by emissions from the Use of sold products (cat. 11; 20%). Some categories like Processing of sold products (cat. 10), Downstream leased assets (cat. 13), Franchises (cat. 14) or Investments (cat. 15) are not applicable for Merck or negligible. Cat. 8 emissions from upstream leased assets are included in Scope 1&2 emissions.

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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This will be the basis for our way forward with regard to processes and tools for product carbon footprinting.

Requesting member

Bayer AG

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

540

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

Merck tracks both Scope 1 and Scope 2 emissions from all its manufacturing sites as well as from the most relevant R&D sites, sites with warehouses and commercial affiliates (in total more than 200 sites). We made huge progress in overall reporting of Scope 3 emissions in the past two years and are now able to report on all 15 categories. Projects are ongoing to improve data quality (e.g., switch from a spend-based approach to a weight-based approach to calculate scope 3, category 1 and 2 emissions).

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This will be the basis for our way forward with regard to processes and tools for product carbon footprinting.

Requesting member

Bayer AG

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

422

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Bayer AG

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

9280

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Bristol-Myers Squibb

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1294

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Bristol-Myers Squibb

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1022

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Bristol-Myers Squibb

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

22494

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

British American Tobacco

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

British American Tobacco

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

British American Tobacco

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

40

Uncertainty (±%)

30

Major sources of emissions

Our scope 3 reporting covers all 15 categories. With a share of approx. 60%, emissions from Purchased goods and services (cat. 1) are the most relevant contributor to our overall scope 3 emissions, followed by emissions from the Use of sold products (cat. 11; 20%). Some categories like Processing of sold products (cat. 10), Downstream leased assets (cat. 13), Franchises (cat. 14) or Investments (cat. 15) are not applicable for Merck or negligible. Cat. 8 emissions from upstream leased assets are included in Scope 1&2 emissions.

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Estee Lauder Companies Inc.

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

26

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Estee Lauder Companies Inc.

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

23

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Estee Lauder Companies Inc.

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)
Category 4: Upstream transportation and distribution
Category 5: Waste generated in operations
Category 6: Business travel
Category 7: Employee commuting
Category 9: Downstream transportation and distribution
Category 11: Use of sold products
Category 12: End-of-life treatment of sold products
Category 13: Downstream leased assets
Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

502

Uncertainty (±%)

30

Major sources of emissions

Our scope 3 reporting covers all 15 categories. With a share of approx. 60%, emissions from Purchased goods and services (cat. 1) are the most relevant contributor to our overall scope 3 emissions, followed by emissions from the Use of sold products (cat. 11; 20%). Some categories like Processing of sold products (cat. 10), Downstream leased assets (cat. 13), Franchises (cat. 14) or Investments (cat. 15) are not applicable for Merck or negligible. Cat. 8 emissions from upstream leased assets are included in Scope 1&2 emissions.

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Infineon

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

701

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Infineon

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

124

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

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Requesting member

Infineon

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

3377

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

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Requesting member

Intel Corporation

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

13465

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Intel Corporation

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2346

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Intel Corporation

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

64134

Uncertainty (±%)

30

Major sources of emissions

Our scope 3 reporting covers all 15 categories. With a share of approx. 60%, emissions from Purchased goods and services (cat. 1) are the most relevant contributor to our overall scope 3 emissions, followed by emissions from the Use of sold products (cat. 11; 20%). Some categories like Processing of sold products (cat. 10), Downstream leased assets (cat. 13), Franchises (cat. 14) or Investments (cat. 15) are not applicable for Merck or negligible. Cat. 8 emissions from upstream leased assets are included in Scope 1 & 2 emissions.

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

International Flavors & Fragrances Inc.

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

15

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

International Flavors & Fragrances Inc.

Scope of emissions

Scope 2

Scope 2 accounting method

Location-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

13

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

290

Uncertainty (±%)

30

Major sources of emissions

Our scope 3 reporting covers all 15 categories. With a share of approx. 60%, emissions from Purchased goods and services (cat. 1) are the most relevant contributor to our overall scope 3 emissions, followed by emissions from the Use of sold products (cat. 11; 20%). Some categories like Processing of sold products (cat. 10), Downstream leased assets (cat. 13), Franchises (cat. 14) or Investments (cat. 15) are not applicable for Merck or negligible. Cat. 8 emissions from upstream leased assets are included in Scope 1&2 emissions.

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Johnson & Johnson

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

5107

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

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Requesting member

Johnson & Johnson

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

3023

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Johnson & Johnson

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services
 Category 2: Capital goods
 Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)
 Category 4: Upstream transportation and distribution
 Category 5: Waste generated in operations
 Category 6: Business travel
 Category 7: Employee commuting
 Category 9: Downstream transportation and distribution
 Category 11: Use of sold products
 Category 12: End-of-life treatment of sold products
 Category 13: Downstream leased assets
 Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

66515

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Johnson & Johnson Consumer

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Johnson & Johnson Consumer

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Johnson & Johnson Consumer

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Johnson Matthey

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

16

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Johnson Matthey

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

14

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Johnson Matthey

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

303

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

L'Oréal

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

129

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

L'Oréal

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

112

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

L'Oréal

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2457

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Medtronic PLC

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

110

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Medtronic PLC

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

95

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Medtronic PLC

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2083

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Micron Technology, Inc.

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

17000

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Micron Technology, Inc.

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2963

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

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Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

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Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

80985

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Novartis

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

3168

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Novartis

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1498

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

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Requesting member

Novartis

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

32976

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Renesas Electronics Corporation

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Renesas Electronics Corporation

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Renesas Electronics Corporation

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products
Category 12: End-of-life treatment of sold products
Category 13: Downstream leased assets
Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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This will be the basis for our way forward with regard to processes and tools for product carbon footprinting.

Requesting member

Robert Bosch GmbH

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

316

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Robert Bosch GmbH

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

58

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Robert Bosch GmbH

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1571

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Samsung Biologics Co Ltd

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

3268

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Samsung Biologics Co Ltd

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1536

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

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Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

33791

Uncertainty (±%)

30

Major sources of emissions

Our scope 3 reporting covers all 15 categories. With a share of approx. 60%, emissions from Purchased goods and services (cat. 1) are the most relevant contributor to our overall scope 3 emissions, followed by emissions from the Use of sold products (cat. 11; 20%). Some categories like Processing of sold products (cat. 10), Downstream leased assets (cat. 13), Franchises (cat. 14) or Investments (cat. 15) are not applicable for Merck or negligible. Cat. 8 emissions from upstream leased assets are included in Scope 1&2 emissions.

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Samsung Display Co.,Ltd

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2230

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Samsung Display Co.,Ltd

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

389

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

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Requesting member

Samsung Display Co.,Ltd

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

8550

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Samsung Electronics

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

17275

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Samsung Electronics

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

3010

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Samsung Electronics

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)
Category 4: Upstream transportation and distribution
Category 5: Waste generated in operations
Category 6: Business travel
Category 7: Employee commuting
Category 9: Downstream transportation and distribution
Category 11: Use of sold products
Category 12: End-of-life treatment of sold products
Category 13: Downstream leased assets
Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

82278

Uncertainty (±%)

30

Major sources of emissions

Our scope 3 reporting covers all 15 categories. With a share of approx. 60%, emissions from Purchased goods and services (cat. 1) are the most relevant contributor to our overall scope 3 emissions, followed by emissions from the Use of sold products (cat. 11; 20%). Some categories like Processing of sold products (cat. 10), Downstream leased assets (cat. 13), Franchises (cat. 14) or Investments (cat. 15) are not applicable for Merck or negligible. Cat. 8 emissions from upstream leased assets are included in Scope 1&2 emissions.

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

SK Hynix

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

8578

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

SK Hynix

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1495

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

SK Hynix

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

40857

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Stéarinerie Dubois

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Stéarinerie Dubois

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

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Requesting member

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Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

4

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

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Requesting member

Sumitomo Chemical Co., Ltd.

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

253

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Sumitomo Chemical Co., Ltd.

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

220

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Sumitomo Chemical Co., Ltd.

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Commodity

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

4839

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Taiwan Semiconductor Manufacturing Company, Ltd.

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

16374

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

Taiwan Semiconductor Manufacturing Company, Ltd.

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2853

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

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Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services
 Category 2: Capital goods
 Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)
 Category 4: Upstream transportation and distribution
 Category 5: Waste generated in operations
 Category 6: Business travel
 Category 7: Employee commuting
 Category 9: Downstream transportation and distribution
 Category 11: Use of sold products
 Category 12: End-of-life treatment of sold products
 Category 13: Downstream leased assets
 Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

77987

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

TDK Corporation

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

3

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

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Requesting member

TDK Corporation

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

3

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

TDK Corporation

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

64

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Teva Pharmaceuticals

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

281

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Teva Pharmaceuticals

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

187

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

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Requesting member

Teva Pharmaceuticals

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

4119

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Xylem Inc

Scope of emissions

Scope 1

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

13

Uncertainty (±%)

30

Major sources of emissions

Energy usage, process-related emissions (emissions of refrigerants from HVACs etc.)

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Xylem Inc

Scope of emissions

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

11

Uncertainty (±%)

30

Major sources of emissions

Energy usage

Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

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Requesting member

Xylem Inc

Scope of emissions

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 1: Purchased goods and services

Category 2: Capital goods

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Category 4: Upstream transportation and distribution

Category 5: Waste generated in operations

Category 6: Business travel

Category 7: Employee commuting

Category 9: Downstream transportation and distribution

Category 11: Use of sold products

Category 12: End-of-life treatment of sold products

Category 13: Downstream leased assets

Category 15: Investments

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

252

Uncertainty (±%)

30

Major sources of emissions

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Verified

No

Allocation method

Other, please specify (Allocation based on revenue/sales)

Market value or quantity of goods/services supplied to the requesting member**Unit for market value or quantity of goods/services supplied**

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Allocation of GHG emissions was carried through on a pro rata basis using customer sales and Merck's total revenues. The figure involves a considerable element of uncertainty that cannot be assessed (see additional information below). Process-related GHG emissions from our Life Science business sector could be allocated to products and customers directly without going the sales-based approach.

Merck tracks both Scope 1 and Scope 2 emissions from all its manufacturing sites as well as from the most relevant R&D sites, sites with warehouses and commercial affiliates (in total more than 200 sites). We made huge progress in overall reporting of Scope 3 emissions in the past two years and are now able to report on all 15 categories. Projects are ongoing to improve data quality (e.g., switch from a spend-based approach to a weight-based approach to calculate scope 3, category 1 and 2 emissions).

In its Healthcare, Life Science and Electronics business sectors, Merck offers more than 300,000 products. Allocation of Scope 1, Scope 2 and Scope 3 emissions to specific products by breaking down site-related or other emissions is currently not possible because very often a single manufacturing site or even a single plant/factory is engaged in the production of a variety of intermediates, products or product groups from multiple business sectors at any given time. Also, most customers purchase multiple products that span across various manufacturing sites, making identification of GHG emissions specific to one customer even more complex.

In 2022 we have started a pilot project to implement an IT tool for calculating portfolio product carbon footprints.

To ensure that we work based on industry standards and can rely on comparable data analytics and expert analysis, we collaborate with our peer companies in industry initiatives. For example, we are a member of Together for Sustainability (TfS). In 2022, we supported the development and launch of the TfS Product Carbon Footprint (PCF) Guideline, which harmonizes PCF calculation methodology across the industry, and led the development of decarbonization training materials for TfS member companies and their suppliers.

This will be the basis for our way forward with regard to processes and tools for product carbon footprinting.

SC1.2**(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).**

No published information has been used.

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges
Diversity of product lines makes accurately accounting for each product/product line cost ineffective	Up to now, we haven't seen an efficient way to allocate GHG emissions to our products and our customers. On the one hand side, there is the need to have a simple, generally accepted, methodology to provide a good estimate for these figures. On the other hand side, tools are needed to calculate product portfolio product carbon footprints. At the moment, physical allocation of GHG emissions by breaking down site related emissions into specific product lines is not possible with justifiable efforts because very often a single manufacturing site or even a single plant/factory is engaged in the production of a variety of intermediates, products or product groups from multiple business sectors at any given time. Considering also the fact that Merck offers several 100,000 products, direct allocation of GHG emissions to specific products is very complex and would require an enormous effort and be costly. Also, most customers purchase multiple products that span across various manufacturing sites, making identification of GHG emissions specific to one customer even more complex. For instance, the companies asking us to respond to CDP Supply Chain purchase several hundreds of different products. Merck made huge progress in overall reporting of Scope 3 emissions in the past three years and is able to report on all 15 categories. Projects are ongoing to improve data quality (e.g., switch from a spend-based approach to a weight-based approach to calculate scope 3, category 1 and 2 emissions). In 2022 we have started a pilot project to implement an IT tool for calculating portfolio product carbon footprints. To ensure that we work based on industry standards and can rely on comparable data analytics and expert analysis, we collaborate with our peer companies in industry initiatives. For example, we are a member of Together for Sustainability (TfS). In 2022, we supported the development and launch of the TfS Product Carbon Footprint (PCF) Guideline, which harmonizes PCF calculation methodology across the industry, and led the development of decarbonization training materials for TfS member companies and their suppliers. This will be the basis for our way forward with regard to processes and tools for product carbon footprinting.
Customer base is too large and diverse to accurately track emissions to the customer level	Up to now, we haven't seen an efficient way to allocate GHG emissions to our products and our customers. On the one hand side, there is the need to have a simple, generally accepted, methodology to provide a good estimate for these figures. On the other hand side, tools are needed to calculate product portfolio product carbon footprints. At the moment, physical allocation of GHG emissions by breaking down site related emissions into specific product lines is not possible with justifiable efforts because very often a single manufacturing site or even a single plant/factory is engaged in the production of a variety of intermediates, products or product groups from multiple business sectors at any given time. Considering also the fact that Merck offers several 100,000 products, direct allocation of GHG emissions to specific products is very complex and would require an enormous effort and be costly. Also, most customers purchase multiple products that span across various manufacturing sites, making identification of GHG emissions specific to one customer even more complex. For instance, the companies asking us to respond to CDP Supply Chain purchase several hundreds of different products. Merck made huge progress in overall reporting of Scope 3 emissions in the past three years and is able to report on all 15 categories. Projects are ongoing to improve data quality (e.g., switch from a spend-based approach to a weight-based approach to calculate scope 3, category 1 and 2 emissions). In 2022 we have started a pilot project to implement an IT tool for calculating portfolio product carbon footprints. To ensure that we work based on industry standards and can rely on comparable data analytics and expert analysis, we collaborate with our peer companies in industry initiatives. For example, we are a member of Together for Sustainability (TfS). In 2022, we supported the development and launch of the TfS Product Carbon Footprint (PCF) Guideline, which harmonizes PCF calculation methodology across the industry, and led the development of decarbonization training materials for TfS member companies and their suppliers. This will be the basis for our way forward with regard to processes and tools for product carbon footprinting.

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?

Yes

SC1.4a

(SC1.4a) Describe how you plan to develop your capabilities.

Merck will continue to refine data collection and GHG calculation methodologies along its value chain and to provide product portfolio related emissions data for our customers.

Merck made huge progress in overall reporting of Scope 3 emissions in the past three years and is able to report on all 15 categories. Projects are ongoing to improve data quality (e.g., switch from a spend-based approach to a weight-based approach to calculate scope 3, category 1 and 2 emissions).

In 2022 we have started a pilot project to implement an IT tool for calculating portfolio product carbon footprints.

To ensure that we work based on industry standards and can rely on comparable data analytics and expert analysis, we collaborate with our peer companies in industry initiatives. For example, we are a member of Together for Sustainability (TfS). In 2022, we supported the development and launch of the TfS Product Carbon Footprint (PCF) Guideline, which harmonizes PCF calculation methodology across the industry, and led the development of decarbonization training materials for TfS member companies and their suppliers.

This will be the basis for our way forward with regard to processes and tools for product carbon footprinting.

Besides these short to mid-term activities our business sectors already work on the sustainability of our products since many years. We are committed to continuously improving and integrating sustainability and circular economy criteria to assess the sustainability performance of our products and portfolio.

In our **Life Science** business sector, we work to reduce the adverse impacts of our products on health and the environment. This applies to the entire life cycle, from manufacture and use to end of life. At the same time, we seek to make our products more efficient and user-friendly, asking ourselves from the start of product development how to best reconcile these requirements.

Through our Design for Sustainability (DfS) framework, we follow a comprehensive approach to increasing the sustainability of our Life Science products. The DfS development pillar provides our product developers with a systematic approach that enables them to analyze product impacts in terms of materials used, energy and emissions, water, packaging, usability, innovation, and circular economy as well as supplier- and manufacturing-related issues. We have developed sustainability criteria that can be used to rank a product's performance in each of these areas. When developing a new product, our aim is to improve on as many of these criteria scores as possible.

To understand the potential environmental impacts throughout the product life cycle, we conduct streamlined product life cycle analyses. The findings from these analyses help us to improve our products and are incorporated into subsequent development stages. Experts from Research and Development (R&D), Product Management, Quality, Procurement, and other departments collaborate along every step of the process.

In our **Healthcare** business sector, we aim to reduce any adverse impacts our medicines may have on the environment during their development, manufacture, transportation, use, and disposal. We are developing an overarching strategy to make our medicines, our medical devices and their packaging more ecologically sustainable and user-friendly.

In 2022, we started to implement the Design for Sustainability framework in our Healthcare R&D approach. We will also establish a governance framework to integrate sustainability and define sustainability criteria for qualitative and quantitative scorecards that can be used to measure sustainability impacts.

Our newly launched Green Biotech program helps to integrate sustainable innovation and state-of-the-art technology into our development processes and products along the clinical manufacturing value chain. This program is aligned with our Healthcare sustainability strategy to drive progress for more than one billion people through sustainable science and technology and is linked to other sustainability projects aimed at helping us achieve climate neutrality by 2040.

In our Electronics business sector, we aim to reduce any potential adverse environmental impacts caused by the manufacture, packaging, transportation, use, and disposal of our products. According to our new principle, highly hazardous materials are to be avoided in our product development process wherever possible. Therefore, we have also prioritized new green and innovative materials that deliver sustainable value to our customers.

Furthermore, the **Electronics** business sector launched a web-based application to automatically extract process and reaction data from research, development and manufacturing databases to calculate and evaluate carbon footprint of our operations. This allows sustainable decision making to reduce resource consumption as well as direct and indirect CO2 emissions from chemical processes. The app has been launched in September of 2022.

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

Requesting member

Acer Inc.

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Acer in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Altria Group, Inc.

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Altria in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Ambev S.A

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Ambev in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

AstraZeneca

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage AstraZeneca in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Bayer AG

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Bayer in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Bristol-Myers Squibb

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Bristol-Myers Squibb in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

British American Tobacco

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage British American Tobacco in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Estee Lauder Companies Inc.

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings

Estimated payback

Please select

Details of proposal

Merck would welcome an opportunity to engage Estée Lauder in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Grupo Boticário

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Grupo Boticário in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Icon PLC

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Icon PLC in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Infineon

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Infineon in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Intel Corporation

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Intel in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

International Flavors & Fragrances Inc.

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage IFF in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Johnson & Johnson

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Johnson & Johnson in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Johnson & Johnson Consumer

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Johnson & Johnson Consumer in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Johnson Matthey

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Johnson Matthey in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

L'Oréal

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage L'Oréal in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Medtronic PLC

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Medtronic PLC in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Micron Technology, Inc.

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Micron Technology in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Novartis

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Novartis in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Renesas Electronics Corporation

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Renesas Electronics Corporation in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Robert Bosch GmbH

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Robert Bosch GmbH in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to

implement reduction activities.

Requesting member

Samsung Biologics Co Ltd

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Samsung Biologics Co., Ltd. in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Samsung Display Co.,Ltd

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Samsung Display Co. in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Samsung Electronics

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Samsung Electronics in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

SK Hynix

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage SK Hynix in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Stéarinerie Dubois

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Stéarinerie Dubois in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Sumitomo Chemical Co., Ltd.

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage Sumitomo Chemical Co., Ltd. in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Taiwan Semiconductor Manufacturing Company, Ltd.

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings**Estimated payback**

Please select

Details of proposal

Merck would welcome an opportunity to engage TSMC in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

TDK Corporation

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings

Estimated payback

Please select

Details of proposal

Merck would welcome an opportunity to engage TDK Corporation in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Teva Pharmaceuticals

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings

Estimated payback

Please select

Details of proposal

Merck would welcome an opportunity to engage Teva Pharmaceutical Industries Ltd. in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

Requesting member

Xylem Inc

Group type of project

Please select

Type of project

Please select

Emissions targeted

Please select

Estimated timeframe for carbon reductions to be realized

Please select

Estimated lifetime CO2e savings

Estimated payback

Please select

Details of proposal

Merck would welcome an opportunity to engage Xylem Inc. in a coordinated action to reduce climate impact and the reduction of GHG emissions. As we are continuously examining and improving environmental performance both internally and externally with customers, we propose to have a meeting to discuss tangible ways to implement reduction activities.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?

No

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?
No, I am not providing data

Submit your response

In which language are you submitting your response?
English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below
I have read and accept the applicable Terms