Sustainability Report 2023

TABLE OF CONTENTS

Strategy & management

4 Company profile
8 Letter from the CEO
11 Sustainability strategy & goals
21 Sustainable Development Goals
23 Stakeholder dialogue
28 Materiality analysis

Business ethics

44 Corporate governance
- **44** Governance
- **46** Compliance management
- **51** Data protection & cyber security
- **53** Interactions with health systems
- **57** Tax governance

59 Suppliers
- **59** Supply chain management
- **64** Mica supply chain

67 Human rights
71 Clinical studies
77 Animal welfare
83 Bioethics
87 Digital ethics

Products

90 Sustainable innovation & technology
94 Products & packaging
- **94** Life Science
- **99** Healthcare
- **101** Electronics

106 Health for all
- **106** Global Health
- **114** Innovation sharing
- **116** Prices of medicines
- **119** Health capacity & awareness

124 Product safety & quality
- **124** Chemical product safety
- **127** Patient safety
- **133** Product-related crime

Employees

137 Career with us
143 Corporate culture
148 Diversity, equity & inclusion
157 Health & safety

Environment

162 Environmental protection
166 Climate action
172 Resource efficiency
- **172** Water management
- **176** Waste & recycling

179 Plant, process & transport safety

Community

183 Community engagement

Facts & figures

190 Report profile
193 Indicators
- **193** Economics
- **194** Business ethics
- **197** Employees
- **212** Environment
- **219** Community

221 GRI content index
- **221** General disclosures
- **225** Economic standards
- **229** Environmental standards
- **235** Social standards
- **244** Additional material topics

246 SASB index
259 TCFD report
270 Assurance report

STRATEGY & MANAGEMENT

4 Company profile

8 Letter from the CEO

11 Sustainability strategy & goals

21 Sustainable Development Goals

23 Stakeholder dialogue

28 Materiality analysis

Company profile

We are Merck, a science and technology company. We are pioneers of human progress, driven by our curiosity.

We are working toward a better future in a special organizational setup and are bringing together different disciplines under one roof with the three business sectors Life Science, Healthcare and Electronics.

Our Life Science business sector provides the tools, high-grade chemicals and consumables that accelerate scientific breakthroughs and enable the biopharmaceutical industry to ensure that medicines are safe and effective for a global population. In our Healthcare business sector, we advance innovation through our research, enable life-changing therapies for serious illnesses, treat patients with cancer, cardiovascular, diabetes, thyroid disorders, and multiple sclerosis, and help people to realize their wish to have a child. In our Electronics business sector, we are the company behind the companies, advancing digital living. Our semiconductor and display solutions are used in the manufacture of many components for electronic devices. We are thus changing the way in which information is processed and made accessible. In addition, our specialists also explore visionary new solutions at the interfaces of our three diversified business sectors.

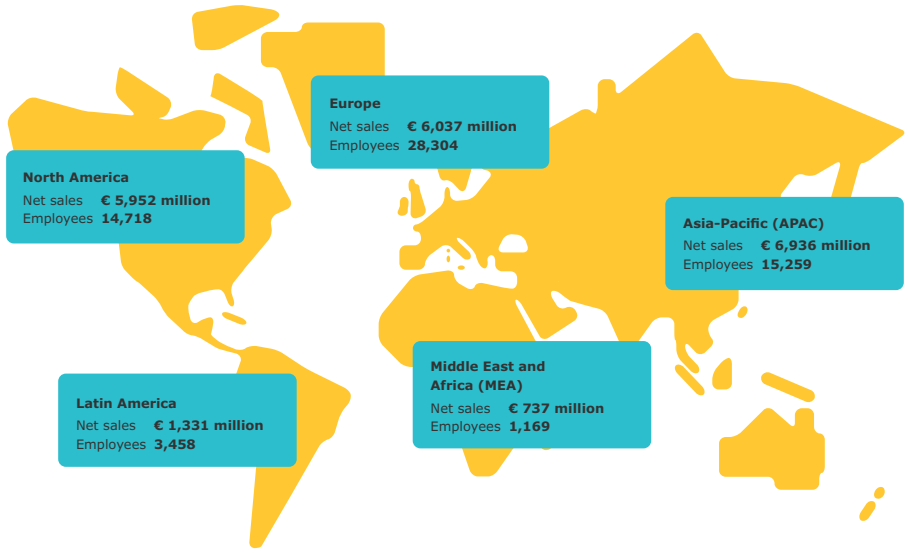
Ever since we were established in 1668, we have continuously reinvented ourselves and adopted a long-term mindset. This approach is rooted in responsibility, care and respect: for our work, our people, our customers, patients, society, and our planet. We want to become the global 21st century science and technology pioneer and are committed to working towards a better future: sustainable progress for humankind.

We hold the global rights to the Merck name and brand. The only exceptions are Canada and the United States. In these countries, we operate as MilliporeSigma in the Life Science business, as EMD Serono in the Healthcare business, and as EMD Electronics in the Electronics business.

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, 2023, we had 62,908 employees worldwide. The figure as of December 31, 2022, was 64,243 employees.

In 2023, our 225 fully consolidated companies with personnel in 65 countries generated sales of € 21.0 billion. Our 101 production sites are located across 19 countries.

Employees and sales by region – 2023



Group structure

In accordance with our strategic orientation our company comprises three business sectors: Life Science, Healthcare and Electronics.

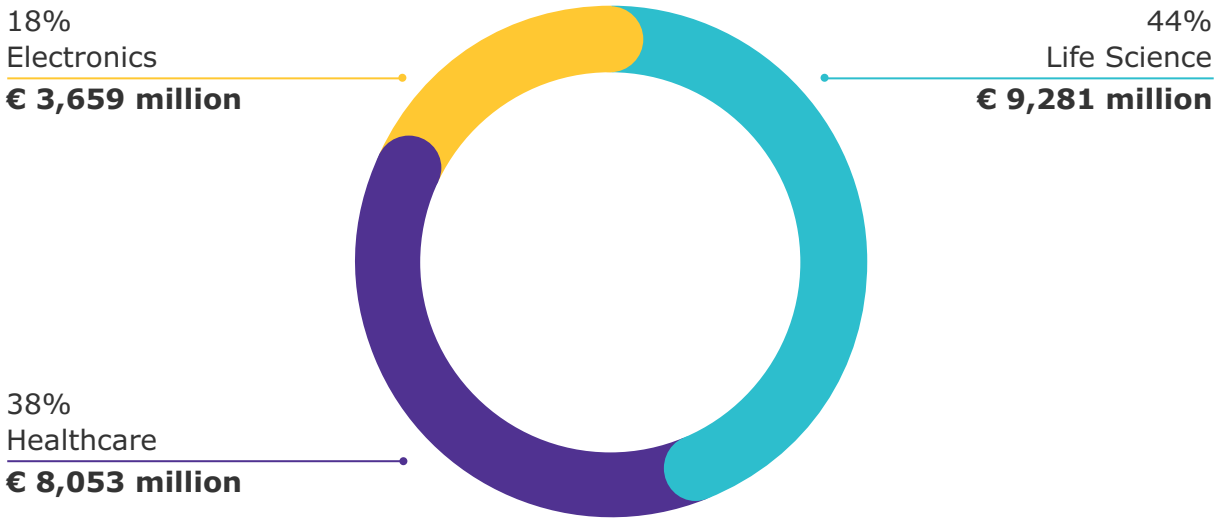
In **Life Science**, we are a leading global provider of products and services for a wide range of customers, including academic labs, biotech and pharmaceutical companies, diagnostic labs, and the industrial sector. Across our Life Science business sector, we collaborate with the global scientific community to deliver innovations and to this end, we offer a broad and deep product portfolio as well as global Contract Testing Development Manufacturing Organization (CTDMO) services ranging from process development to commercialization. In 2023, we continued to execute our strategy as a diversified life science company to strengthen our three business units, Process Solutions, Life Science Services, and Science & Lab Solutions. The Process Solutions business unit continued to focus on delivering its product offering for the pharmaceutical development and manufacture of filtration devices, chromatography resins, single-use assemblies and systems, processing chemicals, and excipients. The Life Science Services business unit offers traditional and novel modalities, including monoclonal antibodies, high-potency active pharmaceutical ingredients and antibody-drug conjugates as well as viral and gene therapies, including mRNA. In addition to manufacturing, Life Science Services includes sales and marketing, research and development and supply chain operations. Our integrated CTDMO services support clients from pre-clinical phases to commercial production. The Science & Lab Solutions business unit serves customers in the pharmaceutical and biotech industries and other industries in production, testing and research, as well as public authorities and research institutions, providing customers with 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.

In our **Healthcare** business sector, we operate as a global specialty innovator in the Neurology & Immunology and Oncology franchises as well as in the therapeutic areas of fertility and cardiovascular, metabolic and endocrinological disorders. The Healthcare business sector discovers, develops, manufactures, and markets pharmaceutical and biological prescription drugs to treat cancer, multiple sclerosis (MS), infertility, and growth

disorders as well as certain cardiovascular and metabolic diseases. Our R&D pipeline is focused on strengthening our position in the fields of oncology, neurology and immunology.

With our **Electronics** business sector, we are a major supplier of materials and solutions for the semiconductor and display industries. We have a portfolio of materials, systems and services as well as R&D and a global production network close to our customers. We have built our portfolio to cater to the continued digitalization and the unabated growth of data. The demand for increasingly sophisticated semiconductor chips and displays will continue to rise, not least thanks to developments such as Artificial Intelligence (AI), 5G (fifth-generation mobile networks) and autonomous driving. In recent years, we have developed into a relevant player in the global electronic materials market. In addition, we offer decorative and functional solutions for surfaces of all kinds. The Electronics business sector consists of three business units: Semiconductor Solutions, Display Solutions and Surface Solutions. Three cross-functional boards support the business units: Technology Leadership Board, Supply Chain Leadership Board, and Commercial Leadership Board. They define cross-sector standards, steer portfolio management, drive forward the exchange on good practice, and promote transparency.

Net sales by business sector – 2023



Governance

The founding family, now in the 13th generation, is still the majority owner. This is made possible by our company structure: a corporation with general partners (Kommanditgesellschaft auf Aktien – KGaA). In a KGaA, the total capital is divided between general partners and limited partners. The founding family holds a 70% stake in the listed Merck Kommanditgesellschaft auf Aktien (Merck KGaA), Darmstadt, as general partner via the Group's ultimate parent company, E. Merck Kommanditgesellschaft, Darmstadt. The remaining 30% of the share capital of Merck KGaA is traded on the regulated market of the Frankfurt Stock Exchange and other stock exchanges. In September 2008, our company was added to the FTSE4Good Index, a sustainability index that assesses the social, ecological and ethical conduct of companies.

Group strategy

We are curious minds dedicated to human progress. We believe that scientific exploration and responsible entrepreneurship are key to technological advances that benefit us all. Our values – courage, achievement, responsibility, respect, integrity, and transparency – guide us in every step we take and in every decision we make. Our company has a firm foundation with convictions and principles that the Merck family has lived for generations. We always take them into consideration when discussing and deciding on our enterprise strategy.

In comparison with last year, headwinds have intensified while the world has become more complex, also in some of our end markets. This poses challenges for the global economy and society. With a history of more than 355 years and a truly global footprint today, we have established a solid, resilient foundation that continues to bolster our confidence in our ambition for the future – to become the global 21st century science and technology pioneer. To achieve this, we continue to focus on our key growth drivers: Process Solutions, Life Science Services, Science & Lab Solutions, and Semiconductor Solutions as well as developing specialty drugs in our Healthcare business. Our must-win battles include establishing a fully data-literate organization and strengthening innovation. For instance, in our “Data & Digital” initiatives, we focus on identifying, prioritizing, and implementing technical capabilities across our businesses to promote future growth.

Through our multi-industry business model, we serve attractive global markets with secular growth trends as a trusted partner to advance human progress. Our diversified portfolio benefits from key megatrends. In Life Science, this includes a growing market for complex and novel modalities. In Healthcare, we develop and commercialize specialty pharmaceuticals in the Oncology and Neurology & Immunology franchises. These include the medicines Erbitux® (cancer), Bavencio® (cancer) and Mavenclad® (multiple sclerosis). In addition, we are conducting clinical trials with late-stage xevinapant (head and neck cancer) and further assets in oncology, neurology and immunology in earlier stages of clinical development. With our comprehensive portfolio of semiconductor materials, we expect to benefit in the medium term from continuously increasing demand for chips due to the exponential growth of data volumes as well as the further implementation of artificial intelligence (AI) and the Internet of Things (IoT).

Ultimately, active portfolio management as an integral part of the strategy of our company successfully enabled our transformation over the last decades and our evolution into a global science and technology pioneer. In this sense, inorganic growth is a relevant element to accelerate strategic plans and to leverage business opportunities in our attractive end markets. Strengthening our key growth businesses remains the highest priority for which mergers and acquisitions (M&A) could serve as an appropriate tool.

You can find more information on our company strategy in our **Annual Report 2023**. Details on the sustainability strategy can be found there and **here in the report**.

Letter from the CEO

Dear readers

Our global society faces many significant risks in 2024, including the devastating wars in the Middle East and Europe, climate denialism, populism, and political extremism. These and other forces threaten to widen fragmentation and weaken solidarity across our communities.

With so much change and uncertainty surrounding us, many people are becoming increasingly selective about who or what they're prepared to trust, and what's worth fighting for. It's therefore insightful that people today are most trusting of scientists out of all societal leadership roles, and that businesses, especially family-led ones, are the most trusted of all institutions[1]. Furthermore, around nine out of ten people believe **science and technology are vital** in addressing big global challenges like climate change and health inequity[2].

That's why I believe our global society is entering a new era of **trust-driven leadership**. Three things will largely determine the ability of any person or organization to influence the future: the history of their actions, the strength of their values, and their ability to unite others behind a common purpose. Merck is well-positioned to thrive in this era as a globally diversified science and technology company with a proud 355-year history of advancing human progress.

We at Merck acknowledge our special leadership responsibility to demonstrate the potential of science as a **powerful force for good**. This 2023 Sustainability Report reflects the growing size and scale of our ambitions. It also highlights our commitment to be fully accountable for our performance and transparent in how we measure our progress.

After reviewing this report, I had two immediate reactions. My first feeling was tremendous pride in what our energetic teams across the globe have achieved. We've come a long way since 2020 when we committed ourselves to three bold overall goals. By 2030, we aim to fully integrate sustainability into our value chains and achieve human progress for more than one billion people through sustainable science and technology. And by 2040, we will achieve climate neutrality. I am pleased to report that we remain **on track to complete these three goals**.

Here are a few examples of the progress we made toward these goals in 2023:

- We reduced our direct (scope 1) and indirect (scope 2) greenhouse gas emissions by nearly 17% compared with the previous year.
- We obtained more than half of our electricity purchased worldwide from renewable sources for the first time.
- We signed virtual power purchase agreements (VPPAs) that will ensure 100% of purchased electricity in Europe, 90% in North America, and 70% worldwide will be covered by renewable energy certificates from 2025.
- We increased the percentage of women in leadership positions worldwide to a record high of 39%.
- And, we were amongst the world's top five pharmaceutical companies enabling access to our medicines in low and middle-income countries.

Yet despite feeling such tremendous pride in these and other achievements during 2023, I also felt there was **no time to rest upon** these accomplishments. Because while we've made a good start on our journey to transform Merck into a global sustainability leader, there is still a long way to go. In particular, we must continue to explore opportunities to accelerate existing programs and enter new areas where we can also make a significant impact.

I'm therefore pleased about how we further **enhanced our sustainability strategy in 2023**. We've introduced new water and waste management targets and strengthened our commitment to biodiversity and circular operations. Furthermore, we're embedding our social responsibilities more deeply into our ways of working and decision-making.

However, embedding sustainability into every part of our business still isn't enough. In parallel, we must do even more to help our customers, partners, suppliers, and industry peers to advance their own sustainability targets. There are three main ways we're making this a reality.

First, to ensure we fully integrate sustainability into our value chains, we are gaining **greater transparency into the performance of our global supplier network**. Two-thirds of relevant suppliers worldwide are now covered by a valid sustainability assessment – a significant increase compared to the prior year. In addition, 2023 is the first year in which we can include primary emission data from our service providers (scope 3.1) into our calculation methodology.

Second, we are strengthening our focus on creating sustainable innovations and technologies for our customers. In Life Science for example, we increased our portfolio of Greener Alternative Products to 2,500 products in 2023, a 34% increase compared to the prior year.

Third, we are closely collaborating with our peers and partners in groups such as the Sustainable Markets Initiative Health Systems Taskforce to leverage our collective power to **accelerate sustainable change** across entire industries.

Amazing things can happen when you set targets and commit to them with the right mix of global and local partners. Consider, for example, our efforts to **eliminate the neglected tropical disease schistosomiasis**.

Over the last 15 years, we have donated over two billion Praziquantel tablets and supported many other programs to fight this devastating parasitic disease across Sub-Saharan Africa and other tropical countries. After reaching 84 million patients last year and securing approval for a new treatment option for children between three months and six years old, we and our many partners are on track to achieve our ambitious goal of eliminating schistosomiasis as a public health problem by 2030.

Being committed to sustainability is no longer just a social mandate but also a business imperative. For companies like ours that **strive to remain ahead of the curve**, we expect our actions will make us an even more trusted partner to customers and patients and a more attractive place for top talent to make an impact.

Thank you for your ongoing trust and support. I look forward to keeping you updated on our progress.

Belén Garijo
Chair of the Executive Board and CEO

1 **The 2024 Edelman Trust Barometer**
2 **2023 3M State of Science Index**

Sustainability strategy & goals

The world is facing numerous challenges that also affect us as a company. These include climate change, international conflicts and economic crises, for instance. Our ambition is to leverage science and technology to achieve sustainable progress for mankind.

Our approach: sustainable progress

In our view, sustainable entrepreneurship and profitable growth go hand in hand; we can remain competitive only by creating **added value for society**. Through our innovative and high-quality products, we want to help meet global challenges. At the same time, these types of product secure our financial performance capability.

Responsible action is an integral part of our company culture. This also includes respecting the interests of our employees, customers, investors, and society. For more than 350 years, our company has been shaped and **guided by strong values** that underpin our understanding of sustainable entrepreneurship. Our success is based on courage, achievement, responsibility, respect, integrity, and transparency.

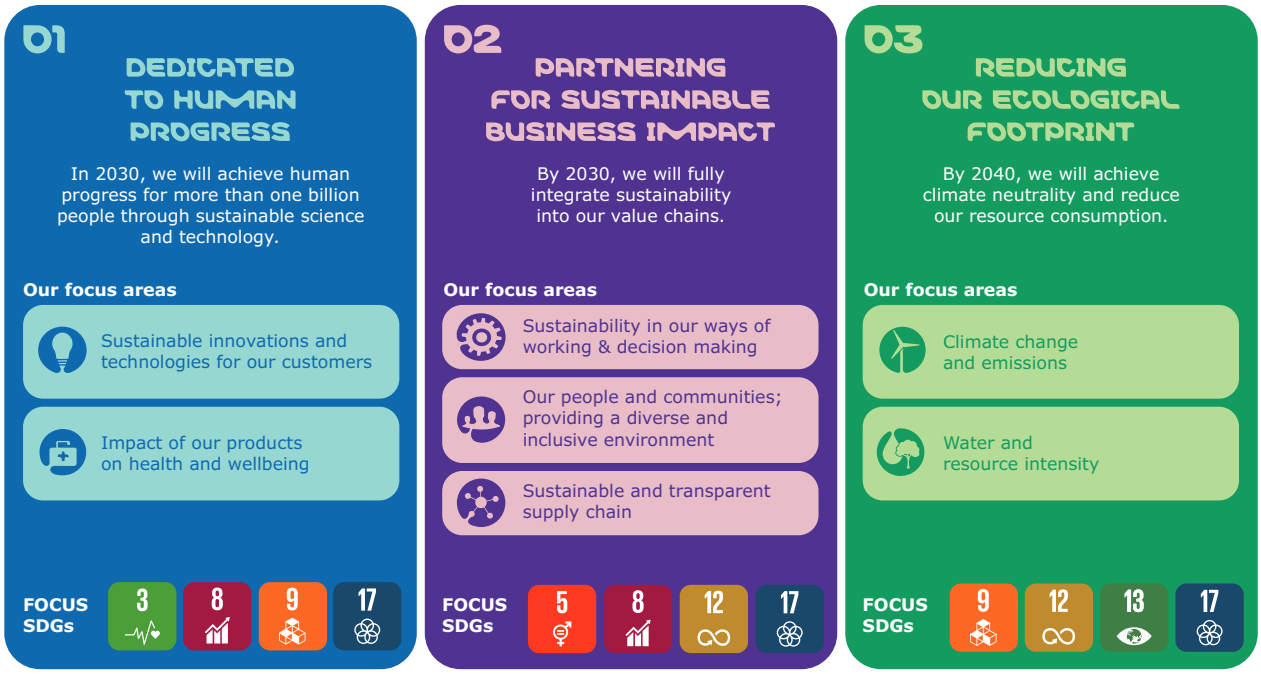
Safety and ethics matter just as much to us as business success. We mitigate **ethical, economic, environmental, and social risks** as far as possible. From the early stages of development through to disposal, we keep an eye on the entire life cycle of a product. We apply strict sustainability standards to our procurement activities. During product manufacture, it is important to us to keep the environmental impact as low as possible, which is why safe production, high environmental standards and strict quality management are of course so important to us. By supplying products that meet extensive sustainability criteria, we also help other companies to achieve their sustainability goals.

We closely monitor **new global trends and challenges** and we use scenario analyses, among other things, in order to clearly understand the complex nature of potential impacts. In addition, we participate in dialogues and initiatives, consult with other organizations in our industry and assess media and news coverage. This enables us to minimize risks while also leveraging **new business opportunities**.

Implementing the strategy globally

The rapidly growing challenges facing both society and the environment require a clear objective for the coming years. Consequently, sustainability is an essential element of our enterprise strategy. We are pursuing three strategic sustainability goals.

Our sustainability strategy



Overall, our sustainability strategy is centered on **seven focus areas** within which we are realizing numerous initiatives and projects today and tomorrow, measuring our progress as we go.

In 2023, we revised our sustainability strategy, which we had communicated in 2020. In particular, we sharpened the second goal: Under the new heading “Partnering for sustainable business impact”, we want to **strengthen our focus on the social aspects in our value chains** and embed sustainability more comprehensively into our decision-making processes. Therefore, in addition to the existing focus area “Sustainable and transparent supply chain”, we are now also working on the new focus areas “Embedding sustainability into our ways of working and decision-making” and “Our people and communities; providing a diverse and inclusive environment”.

For the third goal, “Reducing our ecological footprint”, we modified two of our key indicators for waste and water. The two new indicators valid as of 2024 use more common metrics and also include circular economy criteria. More information on this can be found under Waste & Recycling as well as Water Management.

In addition, we added **two new focus SDGs**: Under the second goal, SDG 5 (Gender equality) to reflect our efforts in the area of diversity, equal opportunities and inclusion. We added SDG 13 (Climate action) under the third goal to reflect our commitment to climate action.

Implementing the sustainability strategy

While we revised our sustainability strategy in 2023, we also forged ahead with its implementation. We want to **change our company culture in the long term** by embedding sustainability aspects even more deeply in our employees’ day-to-day work and decisions. Training courses and best-practice sharing within networks are two routes we follow to achieve this. Moreover, we are integrating the topic of sustainability into the innovation

process and all parts of the value chain. Another one of our aims is to decouple the growth of our businesses from negative environmental impacts.

We use 14 key indicators to record and assess our progress towards achieving our sustainability goals. We defined these indicators back in 2021 and did not identify any significant non-financial performance indicators. The key indicator “Percentage of employees trained in sustainability” was dropped in 2023 because we had achieved the associated target. Instead, as of 2023, we began using several questions in our annual Employee Engagement Survey to measure how mature the sustainability culture is within our organization. More information on this can be found under **Corporate culture**.

We also take **sustainability aspects** into account when evaluating potential acquisitions, as well as when allocating operating capital, deciding on capital expenditure and in research and development.

Moreover, our annual Long-Term Incentive Plan (LTIP) for Executive Board members and senior executives contains a sustainability factor. We use it to measure performance over a period of three years based on selected key indicators for each of our three sustainability goals. Consequently, target achievement based on the key financial performance indicators can increase or decrease by up to 20%. Details on how this sustainability factor is calculated can be found in the **Compensation Report**, which is subject to a special content review by Deloitte GmbH Wirtschaftsprüfungsgesellschaft in addition to a formal audit. In 2023 and for the first time, the company tied 15% of variable employee compensation to sustainability parameters. Details on this can be found under **Sustainable innovation & technology**.

Our key indicators

Goal 1: In 2030, we will achieve human progress for more than one billion people through sustainable science and technology.

Focus area	Sustainability key indicators	Further details
Sustainability innovation and technologies	◆ Percentage of newly published patent families with positive sustainability impact	**Sustainable innovation & technologies**
Impact of our products on health and wellbeing	◆ People treated with our Healthcare products[1]	**SASB index**
	◆ People treated with pharma products enabled by our Life Science business sector[1]	Will be published in 2025

1 The key indicator is used to determine the sustainability factor for the Merck Long-Term Incentive Plan (LTIP).

Goal 2: By 2030, we will fully integrate sustainability into our value chains.

Focus area	Sustainability key indicators	Further details
Sustainability in our ways of working & decision making	◆ Result of the employee engagement survey on sustainability culture[2]	Corporate culture
Our people and communities; providing a diverse and inclusive environment	◆ Percentage of women in leadership positions	Diversity, equity and inclusion
	◆ Environment, Health and Safety (EHS) Incident Rate	Plant, process and transport safety
	◆ Lost Time Injury Rate (LTIR)	Health and safety
Sustainable and transparent supply chain	◆ Percentage of relevant suppliers (in terms of number and supplier spend) that are covered by a valid sustainability assessment[1]	Responsible supply chain
	◆ Violations of Global Social and Labor Standards Policy	Human rights

1 The key indicator is used to determine the sustainability factor for the Merck Long-Term Incentive Plan (LTIP).
2 Key figure "Percentage of employees trained on sustainability" no longer applicable in 2023, as target achieved.

Goal 3: By 2040, we will achieve climate neutrality and reduce our resource consumption.

Focus area	Sustainability key indicators	Further details
Climate change and emissions	◆ Greenhouse gas emissions (Scope 1 and 2)[1]	Climate action
	◆ Indirect greenhouse gas emissions (Scope 3)	Climate action
	◆ Percentage of purchased electricity from renewable sources	Climate action
Water and resource intensity	◆ Waste Score[2]	Waste & recycling
	◆ Water Intensity Score[2]	Water management
	◆ Wastewater quality	Water management

1 The key indicator is used to determine the sustainability factor for the Merck Long-Term Incentive Plan (LTIP).
2 A new key figure will replace this key figure from the 2024 reporting year.

In order to assess the impacts of our products, technologies and business activities on the environment and society, we developed the **Sustainable Business Value (SBV) method**. It enables us to calculate the positive

and negative impacts of our activities along our entire value chain, based on various sustainability criteria. The result is a monetary value that quantifies the benefit that a product has for consumers, the environment and society, for instance. In 2023, we revised the calculation method for environmental aspects and aligned them more closely with our strategic key indicators.

Our operational sustainability goals

Our three strategic goals make our long-term sustainability ambition clear. In order to achieve them, we have also defined operational sustainability goals. These are more specific, may apply for a shorter time frame and are aligned with our current business activities.

Status icons: New | In Progress | Achieved | Not Achieved

Goal 1: In 2030, we will achieve human progress for more than one billion people through sustainable science and technology.

Material topic	Operational target	Actions 2023	Status
Access to Health	By 2030, we will provide sufficient praziquantel tablets to treat more than 90 million patients per year.	Provided over 210 million tablets in 2023, enabling the treatment of around 84 million patients.	In Progress
Access to Health	By 2024, there will be the start of the launch phase to make arpraziquantel dispersible tablets available in the first African countries. By 2030, arpraziquantel will be available to reach up to 12 million preschool-aged children.	Arpraziquantel received a positive scientific opinion from the Committee for Medicinal Products for Human Use (CHMP) - part of the European Medicines Agency (EMA) - in December 2023. This outcome facilitates arpraziquantel's inclusion into the WHO's list of prequalified and essential medicinal products. It will also help to support more direct access to medicines in schistosomiasis-endemic countries.	In Progress
Prices of Medicines	In 2023 we served more than 57 million patients in low- and middle-income countries with our healthcare portfolio. Boosted by our low- and middle-income countries access program called "SHAPE", we aim to reach 80 million patients in those countries per year by 2030.	15 pilots have been initiated, including Argentina, Brazil, Egypt, Indonesia, Mexico and several Central American countries.	New
Patient Safety	By 2025, we will actively deliver product specific safety and benefit-risk strategies to support the execution of all key priority programs in line with internal and external stakeholders' expectations.	Provided high-level safety and benefit-risk contributions to key priority programs in oncology, neurology and immunology. Supported new partnering and in-licensing opportunities with medical safety strategies and outputs.	New

Material topic	Operational target	Actions 2023	Status
		Ensured professional safety contract management with our partners. Integrated Global Patient Safety's tasks and interactions during early development. Actions included the scope extension of the Benefit-Risk Action Team to early development phases, and respective enhancement of the Benefit-Risk Strategy Document to enable early, evidence-based safety decisions.	
Circular Economy, Waste & Recycling	By 2030, 10% of our portfolio will be Greener Alternative Products.	We added 637 Greener Alternative Products to our portfolio. Our free green chemistry tool DOZN™ had over 2,000 users in 78 countries in 2023, helping scientists worldwide make sustainability improvements in their processes and products.	

Goal 2: By 2030, we will fully integrate sustainability into our value chains.

Material topic	Operational target	Actions 2023	Status
Compliance Management	By end of 2023, all subsidiaries of our company will have a new Third Party Risk Management process and tool. By conducting due diligence on all high risk third parties, we check the legal compliance of our business partners.	We started implementing a new workflow-based process for third-party risk management. In addition to the existing high-risk categories, we introduced new general categories to strengthen our due diligence and legal compliance in all countries.	
Interactions with Health Systems and Responsible Marketing	By 2024, we will roll out a risk identification process in a staggered approach to get a better risk overview on bribery and corruption related risks.	We implemented a new tool governing our interactions with healthcare stakeholders.	
Sustainable Supply Chain	By 2024, we will increase transparency of our supply chain by the following two sub-targets: 1) 70% of our relevant number of suppliers will be covered by a valid sustainability assessment 2) 90% of relevant supplier spend will be covered by a valid sustainability assessment. Each of these two sub-targets are weighted 50%.	In 2023, we worked with our relevant suppliers on new assessments and re-assessments, based on the TfS/EcoVadis Assessment process. As a result, 1) 66% of our relevant number of suppliers were covered by a valid sustainability assessment; 2) 94% of our relevant supplier spend were covered by a valid sustainability assessment.	
Animal Welfare	By 2030, we will make a substantial impact on the 4R (reduction, replacement, refinement and	Key indicators: Our Life Science and Healthcare business sectors have developed 4R strategies; corresponding key indicators exist and are	

Material topic	Operational target	Actions 2023	Status
	responsibility) and make our success visible by meaningful performance indicators implemented in our three business sectors.	regularly tracked. In 2023, the Group Animal Welfare Council approved our approach of preparing a roadmap with the aim of eliminating animal research. We published this approach on our website. Professional training and continuing education: We implemented our training concept in 2023. It specifies professional continuing education for all roles across the Group that deal with in-vivo processes. It includes the Animal Affairs Academy as well as the Vivarium Rotation Program. Our Animal Affairs Academy offers numerous internal and external training courses. It also includes an internal website and a newsletter to inform employees about these courses. Additional companies have become signatories to the Marseilles Declaration, a voluntary self-commitment by companies with commercial animal husbandry activities to standards extending beyond local legislation.	
Animal Welfare	By 2025, we will have all our animal facilities AAALAC accredited and will have established an Animal Affairs Academy which provides knowledge in Animal Science and Welfare and drives progress towards our 4R ambitions.	In 2023, the final two still outstanding Group sites received accreditation. Re-accreditation of our sites takes place every three years. In 2023, we rolled out a global 4R training that teaches all employees how they can help to reduce the use of animals and support the transformation towards animal-free value chains. We strengthened refinement through our alignment in 2023 to make “non-aversive handling of research animals“ mandatory for all our animal husbandry facilities. In 2023, the Animal Affairs Academy held more than 60 training courses and workshops on the topic of animal research.	
Animal Welfare	By 2024, we will roll out the process and tool to further streamline the centralized governance for the interactions with healthcare stakeholders and to further increase monitoring as well as risk control capabilities.	IT-based solutions: ◆ We digitized animal welfare-relevant processes, e.g. the approval process for internal work with animals, risk management as well as a reporting system for animal welfare-related incidents. Transparency: ◆ We have set up an internal webinar series called “Let’s talk Animal Affairs” in order to discuss the topic of animal welfare transparently and openly with everyone.	
Working Conditions for	We aim to bring our LTIR (Lost Time Injury Rate) below 1.0 by 2025.	Through our BeSafe! program we continuously raise employee awareness of workplace dangers and teach them rules for safe behavior	

Material topic	Operational target	Actions 2023	Status
Employees			
Equal Treatment and Opportunities for All	Aim for gender parity in leadership by 2030.	We focused on retaining and developing talented women by offering mentoring, sponsoring and talent programs. In addition, we repeated our gender pay equity analysis, launched fertility benefits and a returnship pilot program in Germany to ensure we remain an attractive employer.	
Equal Treatment and Opportunities for All	Aim for 30% nationals from Asia, LATAM and MEA in leadership (Role 4+) by 2030.	We developed a Culture, Nationality & Ethnicity Action Plan. We offered development opportunities for underrepresented ethnic talent as well as continued to explore opportunities to source international and underrepresented ethnic talent. We also continued to train our recruiting and sourcing team members.	
Equal Treatment and Opportunities for All	Aim for 30% of underrepresented ethnic colleagues in United States leadership (Role 4+) by 2030.	We developed a Culture, Nationality & Ethnicity Action Plan. We offered development opportunities for underrepresented ethnic talent as well as continued to explore opportunities to source international and underrepresented ethnic talent. We piloted new programs such as the McKinsey Connected Leaders Academy.	
Equal Treatment and Opportunities for All	By 2026, all leaders will have participated in inclusive leadership workshops.	Until the end of 2023 92% of our leaders took part in the Inclusive Leadership Training.	

Goal 3: By 2040, we will achieve climate neutrality and reduce our resource consumption.

Material topic	Operational target	Actions 2023	Status
Climate Action	By 2030, we aim to cover 80% of our purchased electricity with renewables.	Purchasing electricity from renewable sources (new VPPAs in Europe)	
Climate Action	By 2030, we intend to reduce direct and indirect greenhouse gas emissions (Scope 1 and 2) by 50% (2020 baseline).	◆ Systematic examination of the energy consumption at our individual production sites ◆ Reduction of process-related emissions ◆ Emission reduction through green fleet ◆ Training of employees in energy management ◆ Implementation of energy and water efficiency projects at sites	
Climate Action	By 2030, we intend to reduce direct and indirect greenhouse gas emissions	We continued implementing our sustainable packaging initiative, Mpact. We updated its scope	

Material topic	Operational target	Actions 2023	Status
	(Scope 1 and 2) by 50% (2020 baseline).	and have created several working sub-teams such as sustainable blister packaging and the European Packaging and Packaging Waste Regulation (PPWR), which aim is to follow legal changes and new requirements relevant to our MPact initiative.These sub-teams are working on the alignment with new packaging regulations impacting pharmaceutical industry in the upcoming years.	
Climate Action	By 2030, we intend to reduce direct and indirect greenhouse gas emissions (Scope 1 and 2) by 50% (2020 baseline).	To reduce process-related emissions, we successfully piloted a NF3 abatement technology for high volume manufacturing at our site in Hometown, Pennsylvania, USA. In 2023, we developed the plan for broader deployment.	
Climate Action	By 2030, we aim to reduce our Scope3 emissions along the entire value chain by 52% in relation to gross profit.	Supplier decarbonization Shifting transportation from air to sea	
Innovation and R&D	By 2030, we will avoid 10% of packaging weight per unit of sales through our SMASH Packaging strategy.	We embedded our packaging sustainability principles into the product development process so our R&D teams can target, implement and track potential sustainability improvements in product packaging. In 2023, approximately 65% of new product development projects successfully aligned with at least one of our four key impact areas.	
Water Management	Until 2030, improve water efficiency by 50% in comparison to 2020 (m^3/ revenue in million €)	New target was approved by Board.	
Water Management	Until 2025, improve water efficiency in manufacturing sites by 10% (measured by the Merck Water Intensity Score).	Treatment of wastewater from production Optimization of water-using processes Rainwater harvesting	
Water Management	Reduce environmentally relevant trace substance residues in the wastewater of all production sites to below the no-effect threshold.	Further improving the wastewater treatment process	
Circular Economy, Waste & Recycling	By 2025, reduce the environmental impact of our waste by 5% in comparison to our baseline year 2016 (measured by the Merck Waste Score)	Consistently seeking ways to enhance our production processes and disposal methods	
Circular Economy, Waste & Recycling	By 2030, achieve a circularity rate of 70% across the entire organization	New target was approved by Board.	

Roles and responsibilities

Our Executive Board has Group-wide responsibility for our sustainability strategy. It has adopted our three strategic goals. The Group Corporate Sustainability unit is responsible for developing and shaping the sustainability strategy and it informs the Executive Board at least once a year about the progress made and the need for action. It is part of the Group function Corporate Sustainability, Quality and Trade Compliance (SQ), which reports to the Chair of the Executive Board. At Executive Board level, responsibility for Environment, Social, Governance (ESG) also lies with the Chair of the Executive Board.

Group Corporate Sustainability is also responsible for coordinating the Merck Sustainability Board, which is chaired by the Head of SQ, who simultaneously serves as Chief Sustainability Officer. The committee consists of representatives from our business sectors and from key Group functions, such as Procurement, Communications and Controlling.

The Sustainability Board steers and monitors the Group-wide **implementation of the sustainability strategy**, defines priorities and stipulates globally applicable sustainability policies. In addition, the 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. 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.

In 2023, the Sustainability Board met 11 times by video conference. In addition to climate-related issues and new sustainability reporting requirements, it also addressed the adaptation of the strategy and **new objectives for circular economy and water management**. The measures adopted by the 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 focus of the goal, responsibility is assigned to specific teams, functions and business units. Those responsible for implementing actions exchange ideas and coordinate these in an overarching committee. They identify synergies between the projects and align their direction with our sustainability goals.

The Merck Sustainability Advisory Panel (MSAP) supports our company as an **external expert committee for sustainability.** The panel is chaired by the Head of SQ. It comprises independent experts on sustainability-related topics from various institutions worldwide whom we invite on an ad hoc basis. The MSAP advises our company on selected issues and assesses planned activities. Moreover, the members apply their knowledge to help address societal and political challenges and developments that could be strategically relevant for our businesses.

Sustainable Development Goals

The United Nations (UN) 2030 Agenda is a global plan to sustainably promote peace and prosperity and to protect our planet. Since 2016, countries and organizations have been working to implement this agenda with its 17 Sustainable Development Goals (SDGs). Our aim is for our business activities to create shared value that is both measurable and makes a recognizable contribution to society. We rely on the power of science and technology to make a positive impact.

Doing our part

Our **sustainability strategy** focuses on the seven SDGs on which we have the strongest impact through our entrepreneurial actions. In 2023, we added SDG 5 “Gender equality” and SDG 13 “Climate action” to our focus areas.

SDG 3 – Good health and well-being

With our products, we positively impact the health and quality of life of people around the world. Through technological and scientific innovations, we are also helping to improve the health of underserved populations in low- and middle-income countries.

SDG 5 – Gender equality

We are working to create an equitable, fair, inclusive, and tolerant working environment. One of our priorities is to enable all people to reach their full potential, regardless of their gender. For this reason, gender equality is enshrined in our corporate governance and we are committed to diversity and equal opportunity through our support programs, networks and partnerships.

SDG 8 – Decent work and economic growth

We see it as our responsibility to respect human rights both within our company and along our supply chain. That is why we are dedicated to upholding appropriate and fair labor and social standards. We want to drive sustainable economic growth through progressive resource efficiency.

SDG 9 – Industry, innovation and infrastructure

We use our expertise in science and technology to make our products, processes and infrastructure sustainable. In addition, we want to promote the work of scientists worldwide with our innovations and support programs.

SDG 12 – Responsible consumption and production

We use resources efficiently and reduce waste and emissions. We pay attention to this in our product development and in our manufacturing activities. We also help our customers to manufacture their products more sustainably and efficiently and to achieve their own sustainability goals.

SDG 13 – Climate action

Limiting climate change is one of the most urgent social responsibilities of the 21st century. Through our climate action, we intend to contribute to the Paris Agreement and achieve climate-neutral operations throughout our entire value chain by 2040.

SDG 17 – Partnerships for the goals

We need strong partners in order to drive sustainable development within our company and beyond and to better meet societal challenges. To this end, we collaborate with a wide range of organizations, companies, federations, and networks.

Through our sustainability strategy, we help **to solve challenges globally**, not just within these seven SDGs. With our management approaches and projects, we also support **SDG 4** (Quality education), **SDG 6** (Clean water and sanitation) and **SDG 7** (Affordable and clean energy).

Detailed information on our quantitative and qualitative contributions to the specific SDGs is provided in our **interactive SDG tool**.

The SDG tool was not part of the **audit with limited assurance**, conducted by the independent auditor Deloitte GmbH for our 2023 Sustainability Report.

Stakeholder dialogue

Engaging with our various stakeholders is crucial for us. Through this dialogue, we communicate our decisions and actions transparently in order to secure our social license to operate. We aim to unite divergent interests, as well as build and sustain trust.

Dialogue at various levels

Our key **stakeholders** include our employees, customers and business partners, various patients, the Merck family as the majority owner of the company, shareholders, and our suppliers. We pursue a continuous dialogue with our stakeholders and use this exchange to identify trends and developments in society and in our business fields so as to take them into account in our corporate responsibility endeavors.

Our stakeholders

We regularly conduct a systematic **materiality analysis** to learn about our **stakeholders' expectations**. In doing so, we identify the economic, social and environmental issues that are important to our stakeholders – and thus also to us.

We have established **guidelines and principles** for interactions with certain stakeholders, with a focus on compliance. For example, we have defined internal guidelines and review processes for **patient relationships**, **interactions with healthcare stakeholders** and **business partnerships**.

The Merck Sustainability Advisory Panel (MSAP), a group of external experts from various disciplines, has been advising us on the topic of sustainability since 2021. It enables our company to understand even more diverse stakeholder perspectives and helps us to develop our sustainability strategy further. More information on MSAP and its members can be found under **Sustainability strategy and goals**.

We communicate regularly with our stakeholders through a variety of channels. For instance, we conduct stakeholder surveys and organize topic-specific dialogues at regional, national and international level. We also participate in discussions and informational forums as well as through our advocacy work and industry coalitions. Here are some examples of the dialogue formats used:

Employees

Employee engagement surveys

- **Our approach: Unlocking our collective potential**
- **Enabling our employees**

360 degree feedback

- **Embracing conversation and dialogue**

Intranet "EVA"

Career fairs

- **Supporting the next generation**
- **Attracting and inspiring key talent**

Patient organizations

Patient Advisory Boards (PAB) to engage patient organizations in our clinical research

- **Close dialogue with patients and advocacy groups**

Member of various initiatives on the quality and efficiency of clinical trials

- **Close dialogue with patients and advocacy groups**

Employee representatives

Involvement of local employee representatives in company decisions

- **Our commitment: Employee representatives**
- **A competitive compensation and benefits structure**

Science

Merck Ethics Advisory Panel (MEAP); Digital Ethics Advisory Panel (DEAP); TU Darmstadt

- **Merck Ethics Advisory Panel**
- **Digital Ethics Advisory Panel**
- **Fruitful strategic partnership**
- **Promoting the circular economy**

Communities

Discussion and information forums for residents in the vicinity of our sites

- **Roundtables and informational forums**

Healthcare systems

Collaborating with health authorities and other stakeholders as well as event series and network meetings

- **Engaging stakeholders**
- **Collaborating with patient and carer organizations**
- **Close dialogue with patients and advocacy groups**

Associations/Politics

Collaboration in working groups

- **Advocacy groups and industry coalitions**

Suppliers

Supplier surveys

- **Supply chain assessments and audits**
- **Auditing our mica supply chain**

Knowledge sharing

- **Ambassadors for sustainable procurement**

Shareholders

Annual General Meeting

- **Investor Relations**

Events for investor groups

- **Capital markets days**

Public authorities

Subject-specific cooperation

- **Pharmacovigilance in Access to Health**
- **Monitoring drug safety**

Further information on stakeholder dialogues can be found in the individual report chapters.

Roundtables and informational forums

We hold roundtable discussions and informational forums for local residents at our major sites. Since 1994, we have been holding an annual public planning forum in Darmstadt to discuss the development of our site with members of the city council, local authorities and the community.

Involvement in initiatives

We collaborate with an array of civic organizations and also participate in other **initiatives** that share our commitment to responsible corporate conduct, such as **Chemie³** and **Responsible Care®**.

Advocacy groups and industry coalitions

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:

- 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**)

Political contributions

Our interactions with members of the political community 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.

In the United States, political action committees (PACs) have been set up through which our employees can donate money to support political candidates and organizations. These are not donations made by our company, but rather contributions made by employees. The contributions donated are reported to the U.S. Federal Election Commission and are fully disclosed.

Materiality analysis

With our annual materiality analysis, we identify the social, economic and environmental issues that are of material importance to us and our stakeholders. In 2023, we closely examined for the first time the upcoming requirements of the European Sustainability Reporting standards (ESRS).

Identifying the material issues

We conduct an annual materiality analysis to identify sustainability topics that are particularly important to us. In this way, we determine the priorities for our sustainability management and our reporting. Our materiality analysis meets the requirements of the Global Reporting Initiative (**GRI**) reporting standard and also forms the basis for the materiality analysis of the CSR Directive Implementation Act (CSR-RUG). In 2023, we also addressed the upcoming requirements of the new EU Corporate Sustainability Reporting Directive (CSRD), which our company must comply with as of the 2024 reporting year, accompanied by the obligation to comply with the new ESRS reporting standards. Initial insights derived from these requirements were already incorporated into our analysis in 2023. For example, we compared our current material topics with the requirements of the ESRS and adapted the methodology for assessing actual and potential impacts.

In our analysis, we looked at actual as well as potentially positive and negative environmental, economic and social impacts of our business activities. In addition to internal data analyzed by us, the evaluation also included feedback from external stakeholders.

Similar to the previous year, we classified the negative impacts into four categories: low, moderate, significant, and critical. At the same time, we categorized the positive impacts as follows: low, moderate, significant, or substantial. We defined a topic as material if a positive or negative impact is classified as at least moderate in one of the steps of the value chain. The results of the materiality analysis were validated by the Merck Sustainability Board (MSB).

The following list contains all material topics including their actual or potential positive and negative impacts. Impacts identified as material are indicated with a checkmark.

Results of the materiality analysis

Compliance management

Value chain	Upstream	Own operations	Downstream
Positive impact:		✓	
Negative impact:	✓		

We take various measures to ensure that all employees have the opportunity to speak out anonymously and safely. In addition, we have numerous measures in place, such as policies, trainings and awareness campaigns. Therefore, we classify our potential positive impact in our own business as moderate.

Due to the nature of our business activities and the inevitable possibility of compliance-related risks, we classify the potential negative impact to be moderate in our upstream value chain and low in our own business. In response, our company aims to ensure that all business activities adhere to the relevant laws, regulations and ethical standards. In addition, we do not limit our compliance management to our own company; we also include suppliers and our interactions with sales parties such as commercial agents, distributors and dealers.

Chapter:

- **Compliance management**

Data protection & cyber security

Value chain	Upstream	Own operations	Downstream
Positive impact:		✓	✓
Negative impact:			✓

Concerning the topic data protection & cyber security we have comprehensive measures in place. We strive to safeguard the rights of any person whose data we process, including but not limited to our employees, patients, customers, and healthcare professionals. When it comes to cyber security, our company understands the importance of protecting our business from cybercrime and ensuring our information is secure from any associated internal and external risks. Therefore, we classify our actual positive impact to be substantial.

Due to the nature of our business activities, there is always the possibility of data-related risks. In response, our company aims to ensure that all business activities adhere to the relevant laws, regulations and ethical standards. In addition, we do not limit our compliance management regarding data protection & cyber security to the boundaries of our own company; we also include suppliers and our interactions with sales parties such as commercial agents, distributors and dealers. We strive to make all important information regarding our products and their use accessible to our consumers and end users. In doing so, it is important to respect the privacy of our users. Therefore, we classify our potential negative impact in our own business as low and in the downstream value chain as moderate.

Chapter:

- **Data protection & cyber security**

Interactions with health systems and responsible marketing

Value chain	Upstream	Own operations	Downstream
Positive impact:			✓
Negative impact:			✓

We believe that in order to achieve health for all, it is imperative to help health professionals make informed decisions about treatment paths while keeping patient benefit always at the center. We interact with healthy systems by implementing various capacity and awareness-building initiatives to contribute to medical advances that benefit patients and to fostering stronger health systems. Therefore, we classify our actual positive impact on interactions with health systems in the downstream value chain as substantial.

Healthcare stakeholders need up-to-date information on diseases and treatments while safeguarding their independence at the same time. Due to the nature of our business activities, there is always the possibility of compliance-related risks. In response, we aim to ensure that all business activities adhere to the relevant laws, regulations and ethical standards. Thus, we classify the potential negative impact on the topic of interactions with health systems to be moderate in our downstream value chain.

Chapter:

- **Responsible interactions with health systems**

Sustainable supply chain

Value chain	Upstream	Own operations	Downstream
Positive impact:	✓		
Negative impact:	✓		

We offer opportunities for training and creating awareness of standards that can have a positive influence on how suppliers operate. Further potential positive impacts arise from the stakeholder dialogue, and in particular the dialogue with suppliers, which addresses what support suppliers need and in what form. We therefore classify our actual positive impact on sustainable supply chain in the upstream value chain as moderate.

Due to the nature of our business, we classify the potential negative impact regarding working conditions, equal treatment and opportunities, other work-related rights (e.g. child labor, forced labor), and sustainable supply chain to be moderate in the upstream value chain. We have guidelines and measures in place to improve working conditions in the supply chain in addition to careful monitoring through regular assessments and audits. These measures reduce the potential for negative impacts within our supply chain. At the same time, the possibility for us to influence external organizations is more limited than within our own company.

Chapter:

- **Supply chain management**
- **Mica supply chain**

Human rights

Value chain	Upstream	Own operations	Downstream
Positive impact:	✓	✓	
Negative impact:	✓		

The Responsible Mica Initiative can be seen as an initial pilot project (deep dive) where a real attempt is made to make a positive difference in the supply chain. This relates in particular to the improvement of livelihoods and educational opportunities, which have an impact on basic human rights in the respective region. Further potential positive impacts arise from the stakeholder dialogue, and in particular the dialogue with suppliers, which also includes the issue of human rights, e.g. through the initiative Together for Sustainability. In our own business we have several policies and guidelines in place, such as our Social and Labor Standards Policy, that help to extensively ensure attentive management of the topic of human rights. We therefore classify our actual positive impact to be moderate in the upstream value chain and our potential positive impact to be significant in our own business.

When it comes to our global supply chains, we pay close attention to human rights risks. We expect our suppliers to exercise the greatest care in dealing with human rights. Unlike in our own business activities, we can often only have an indirect influence along our supply chain to prevent negative impacts. Our principles have been set out in Group-wide policies, which we use to derive measures to avoid negative impacts within the supply chain. We use our human rights due diligence approach to prevent and mitigate human rights risks and have integrated a Human Rights Charter and a Supplier Code of Conduct. Our projects and activities, such as the Responsible Mica Initiative and community empowerment show efforts to reduce human rights risks in the supply chain that also go beyond compliance with supply chain laws. We classify our potential negative impacts with regard to human rights in the upstream value chain as moderate and in our own business and the downstream value chain as low.

Chapter:

- **Human rights**

Clinical studies

Value chain	Upstream	Own operations	Downstream
Positive impact:		✓	✓
Negative impact:		✓	✓

We conduct our clinical studies in compliance with high ethical and scientific standards, going beyond the minimum legal requirements and implementing patient-focused drug development that more actively involves patients, caregivers and their advocates. These activities ultimately improve the healthcare people receive and enable the delivery of new treatments for people worldwide. In addition, we make our research studies available to the public and other institutions to enhance the efficiency and effectiveness of medicine and treatments globally. Therefore, we classify the potential positive impact of our ethical conduct in the field of clinical studies in our own business and our downstream value chain to be significant.

We address the potential risks of non-compliance and non-adherence with international laws through measures such as implementing strict standards, policies, audits, and country selections. We therefore classify the potential negative impacts in our own business as well as our downstream value chain to be moderate.

Chapter:

- **Clinical studies**

Animal welfare

Value chain	Upstream	Own operations	Downstream
Positive impact:		✓	✓
Negative impact:	✓	✓	✓

We are developing and commercializing various technologies and systems in order to replace the use of animals by alternatives step-by-step, and eventually entirely. We also engage in external partnerships to promote animal welfare beyond our own company and contract research organizations and foster transparency in animal research communication. Additionally, we are involved in developing sustainable technologies, such as cultured meat, which could eventually support a global transition towards more sustainable nutrition systems and reduced meat consumption (and interlinked health and environmental impacts). Furthermore, we are working to replace fetal bovine serum and other animal-derived products with animal-free alternatives, such as the animal-free test kits (e.g. PyroMAT) which replaced an animal test. The Life Science business sector also is involved in animal-free antibody production (e.g. the ZooMAb and Capricorn projects). Therefore, we classify our potential positive impact within our own business and in the downstream value chain on animal welfare as significant.

The use of animals is often a legal and regulatory requirement across many areas of our business to ensure the quality, safety and efficacy of our products and processes. Consequently, our use of animals inevitably creates

an actual negative impact. We have implemented the 4Rs for animal-based research (replacement, reduction, refinement, and responsibility) and have set ourselves the ambitious goal of phasing out animal use and replacing animals with better alternatives on a long-term basis. Until we achieve this goal, we accept the ethical standards as defined in our quality documents in animal science and welfare. We classify the actual negative impact on animal welfare in our own business and in our upstream value chain to be critical. In the upstream value chain, we cannot guarantee the same animal welfare as in our own business.

Chapter:

- **Animal welfare**

Bioethics

Value chain	**Upstream**	**Own operations**	**Downstream**
Positive impact:		✓	
Negative impact:			

The Merck Ethics Advisory Panel for Science and Technology (MEAP) enables our various business units to adequately address (bio)ethical issues that arise in connection with our scientific and technological innovations. Through our work, we demonstrate how bioethical principles and guidelines can be considered and integrated in scientific and technological progress in a corporate context. The MEAP provides ethically sound guidance – especially for cases of scientific and technological progress that are not yet covered by existing guidelines. With guidelines such as the Genome Editing Principle or the Stem Cell Principle, we help to establish ethical positions beyond the boundaries of our company and thus assess our potential positive impact on bioethics as moderate within our own business.

Our company is committed to ethical research. When we advise on innovations from a bioethical perspective, questions may well arise that go far beyond the applicable legislation. Such issues often only come to light after an in-depth ethical analysis. Therefore, there is a risk that we may not always behave in a bioethically correct manner along our value chain. Our goal is to minimize these potential negative impacts by developing clear guidelines and establishing regulations for bioethical issues. Thus, we consider the potential negative impacts in our upstream and downstream value chain as well as in our own business to be low.

Chapter:

- **Bioethics**

Digital ethics

Value chain	Upstream	Own operations	Downstream
Positive impact:	✓	✓	
Negative impact:			

Through our CoDE and the Digital Ethics Advisory Panel (DEAP), we address ethical issues regarding the area of data & digital. We thus have a positive cross-border impact, which sets an example for the further development of ethical standards beyond our company. Overall, we classify our potential positive impact on digital ethics within our upstream value chain and in our own business to be moderate.

Non-compliance with digital-ethical standards poses risks for people and the environment. We use various initiatives to support digital ethics and classify the potential negative impacts in our upstream value chain as well as in own business as low.

Chapter:

- **Digital ethics**

Innovation and R&D

Value chain	Upstream	Own operations	Downstream
Positive impact:		✓	✓
Negative impact:	✓	✓	

Our products, namely our medicines and our biological and chemical innovations that utilize the latest technologies, have an actual positive impact on human progress and global health . To develop pioneering solutions that have a positive impact on society and support organic growth, Merck is exploring transformative technologies beyond core products and markets. We therefore classify the actual positive impact concerning innovation and R&D in our own business and in our downstream value chain to be substantial.

Researching, innovating and manufacturing new products creates a negative environmental footprint owing to the use of a large variety of resources. We reduce this impact through internal measures, such as using more sustainable raw materials and packaging and by researching innovative and sustainable materials. Therefore, we classify the potential negative impact on this topic to be moderate in the upstream value chain and our own business and low in the downstream value chain.

Chapter:

- **Sustainable innovation & technology**
- **Sustainable Products & Packaging: Life Science**
- **Sustainable Products & Packaging: Healthcare**
- **Sustainable Products & Packaging: Electronics**

Access to Health

Value chain	Upstream	Own operations	Downstream
Positive impact:			✓
Negative impact:			✓

We strive to make health solutions available, affordable and accessible to all. As part of our commitment, we are implementing our Access Strategy for low- and middle-income countries (LMICs) to fulfill our ambition to serve over 170 million patients per year in these countries by 2030. For non-communicable diseases (such as cancer indications and endocrine disorders), we are committed to offering equitable pricing and to strengthen health systems. We aim to, firstly, make our existing innovative therapies available to more countries and patients and, secondly, to launch our healthcare innovations in LMICs within 12 months after the first global launch. For the neglected tropical disease, schistosomiasis, we apply an integrated approach towards the elimination of the disease as a public health problem by 2030. We also engage in the fight against malaria. On top of that, we want to enable patients and health professionals to make informed decisions about treatment paths. Thus, we are implementing several initiatives to build health capacity and awareness in LMICs. Therefore, we classify our actual positive impact on access to health in the downstream value chain of our existing products and innovations as substantial.

We are committed to health for all. Through our Access Strategy for low- and middle-income countries, we aim to increase the impact of our healthcare innovations and existing products, such as therapies for cancer and endocrine disorders, through access efforts in those countries. We continue to engage in the fight against schistosomiasis and malaria. We also invest in local initiatives to strengthen health systems and improve access to health.

We recognize that these are extremely difficult and complex challenges, which is why we take a collaborative approach with our partners and stakeholders in all our access initiatives. Considering these, we classify our potential negative impact on the topic of access to health in our downstream value chain to be moderate.

Chapter:

- **Global health**
- **Innovation sharing**
- **Health capacity & awareness**

Prices of medicines

Value chain	Upstream	Own operations	Downstream
Positive impact:			✓
Negative impact:			

As part of our commitment to health for all, we will implement our Access Strategy to reach millions of patients in low- and middle-income countries. Our holistic approach includes a focus on affordability. We are working to

prevent cost from becoming a barrier to treatment. Therefore, we adapt our medicine prices according to people's ability to pay in different geographic and socioeconomic segments. We are committed to fair, flexible and sustainable pricing – both within and across countries. We therefore adapt our prices based on local market considerations, such as unmet medical and treatment needs, health system capacity as well as infrastructure and socioeconomic standards. Therefore, we classify our actual positive impact on prices of medicine in the downstream value chain of our healthcare portfolio as substantial.

We strive to make health solutions affordable and accessible and collaboratively work with partners and stakeholders to speed up access to quality health solutions for all – focusing on low-and middle-income countries. As part of these efforts, we have implemented patient access programs and our equitable pricing policy to enable more patients to afford our product portfolio. When taking our measures and projects into account, we classify our potential negative impact on the topic of prices of medicines in our downstream value chain as low.

Chapter:

- **Prices of medicines**

Chemical product safety

Value chain	Upstream	Own operations	Downstream
Positive impact:		✓	✓
Negative impact:	✓	✓	✓

Our commitment to chemical product safety is one of the cornerstones of our business as we process and handle hundreds of thousands of hazardous chemicals. We continuously improve our activities around product safety to the benefit of the environment as well as our customers and employees. In addition, we proactively and regularly develop, assess and implement new safety-related data and information and adapt our risk mitigation measures accordingly. Regarding chemical product safety, we consequently classify our actual positive impact in our own business and in our downstream value chain to be substantial.

Many of our chemical products have intrinsic hazardous properties. To mitigate potential negative impacts of hazardous chemicals, we have strict guidelines and measures in place to ensure safe working conditions. For users of our products, we provide the necessary information for dealing with hazardous substances safely. Some uncertainty exists regarding the state of chemical product safety at the supplier level. Therefore, we classify our potential negative impact on the topic of chemical product safety for the upstream value chain to be significant. In our own business as well as in the downstream value chain we classify our potential negative impact to be moderate.

Chapter:

- **Chemical product safety**

Patient safety

Value chain	Upstream	Own operations	Downstream
Positive impact:			✓
Negative impact:			✓

We collaborate with health authorities in low- and middle-income countries to help improve national pharmacovigilance systems and operating environments. We implement pharmacovigilance measures widely around the world even in countries without pharmacovigilance regulations. In 2022, we included the topic of patient safety in the update of our Supplier Code of Conduct, which we published in 2023. Therefore, we classify our potential positive impact on the topic in the downstream value chain to be significant.

Patient safety is fundamental to delivering quality health services and therefore has high relevance throughout the Healthcare business sector. Our company follows international guidance, standard procedures and all relevant pharmacovigilance regulations to mitigate the potential negative impacts on patient safety. It is the nature of medicinal products to bear intrinsic safety risks while providing treatment benefits to patients. Considering the therapeutic areas of our product portfolios, we classify the potential negative impact on the topic of patient safety in our downstream value chain as moderate.

Chapter:

- **Patient safety**

Product-related crime

Value chain	Upstream	Own operations	Downstream
Positive impact:			✓
Negative impact:			✓

Our actions and initiatives to reduce the risks associated with product-related crime often exceed the minimum legal requirements. For example, we support authorities in detecting and resolving cases of product-related crime. We also provide training for employees and business partners to strengthen their competencies in detecting product-related crime. Overall, we classify our potential positive impact in our downstream value chain to be moderate.

Illegal, counterfeit and substandard medicines pose a significant risk to public health and chemicals may be misused for criminal purposes such as manufacturing illicit drugs. We have enacted various measures to mitigate the risk of product-related crime. However, we classify the potential negative impact in our downstream value chain to be significant.

Chapter:

- **Product-related crime**

Working Conditions for employees

Value chain	Upstream	Own operations	Downstream
Positive impact:		✓	
Negative impact:			

We are enhancing our attractiveness as an employer, for instance by creating flexible working environments and taking beneficial measures for our employees extending well beyond compliance with national laws worldwide. Further, our activities aim to ensure the safety of the people who work for us since we continuously assess and reduce safety risks. Through training measures, we are also raising awareness both of occupational hazards and behaviors that promote health and safety. By taking various measures, we encourage our employees to live a healthy lifestyle. Therefore, we classify our potential positive impact on the topics of working conditions in our own business as significant.

Poor working conditions (including occupational health and safety) and a negative working environment can negatively impact quality and productivity. Further, a poor work-life balance may be detrimental to employees' physical, mental and emotional well-being. For this reason, we have implemented several charters, policies and standards to create an attractive and healthy working environment for all employees, including competitive compensation structures. Therefore, we classify our potential negative impact on the topic working conditions for our employees in our own business as low.

Chapter:

- **Career with us**
- **Corporate culture**
- **Health & safety**

Equal treatment and opportunities for all

Value chain	Upstream	Own operations	Downstream
Positive impact:		✓	
Negative impact:			

Our aspiration to build an inclusive culture in which employees feel welcome and valued extends well beyond compliance with existing laws and regulations. We have taken clear commitments on DE&I to hold ourselves accountable and have realized numerous initiatives to underpin our commitments, for example a global gender pay equity review or inclusive leadership training seminars offered to all people managers. In addition, we have more than 60 internal DE&I employee groups and networks worldwide that actively contribute to our DE&I strategy. Therefore, we classify our potential positive impact on the topic of equal treatment and opportunities for all in our own business as significant.

Disrespecting equal opportunities and non-discrimination can lead to human rights violations in the workplace and therefore have potential negative impacts on humans and society. Our efforts to promote and support

diversity, equity, inclusion, non-discrimination, and LGBTQI+ rights are extensive. Therefore, we classify our potential negative impact on equal treatment and opportunities for all in our business as low.

Chapter:

- **Diversity, equity & inclusion**

Climate Action

Value chain	Upstream	Own operations	Downstream
Positive impact:	✓	✓	
Negative impact:	✓	✓	✓

We are in the early stages of a long carbon reduction journey. Therefore, we are investigating and implementing a variety of mitigation measures to significantly reduce our carbon footprint. In our upstream value chain, we have a supplier decarbonization program in place to reduce GHG emissions. Furthermore, we have set incentives for our own workforce to increase their use of green mobility and, with our Green Fleet pilot, we are increasing the number of charging stations to expand the charging infrastructure for e-mobility. On top of that, various activities and targets are being implemented to reduce our process-related emissions and we are striving to increase our share of energy gained from renewable resources. Overall, we classify our potential positive impact within our upstream value chain as significant and in our own business regarding climate change and energy as moderate. Within our downstream value chain, no potential or actual positive impact was identified.

Company-specific greenhouse gas (GHG) emissions (Scope 1 and 2) contribute to global environmental degradation. Overall, the GHG emissions associated with our purchased goods and services (part of Scope 3) represent the largest share of our total carbon footprint. We classify our actual negative impact on the topic climate action (including climate change and energy) to be critical in the upstream value chain. In the Electronics business sector, we classify the actual negative impact to be critical in our own business and in the downstream value chain. For our Life Science and Healthcare business sectors of our own business and our administration, we classify our actual negative impact on the topic climate action to be significant.

Chapter:

- **Climate Action**

Water management

Value chain	Upstream	Own operations	Downstream
Positive impact:			
Negative impact:	✓	✓	✓

With respect to our water management activities, we have strong mitigating measures in place. These are primarily aimed at complying with regulations. Moreover, our goal is to bring our effluents to the predicted no

effect concentration (PNEC). Consequently, we classify the actual positive impact concerning water management to be low.

As a manufacturer of chemical and pharmaceutical products, we require significant volumes of water. The extraction of water reduces its availability in the natural environment and for other water users. Additionally, there is always a risk of negatively impacting the health and viability of ecosystems due to wastewater discharge and the potential pollution of water and soil. We have many initiatives in place to reduce our impact on water quality and availability. For example, we have implemented strict global standards and requirements at all of our manufacturing sites for wastewater treatment. Some of these requirements also go beyond our own business, such as the Responsible Minerals Sourcing Charter, which requires suppliers to have wastewater management systems and processes in place. These activities mitigate our negative impacts. We classify our actual negative impact to be moderate in our upstream value chain and in our own business. In the downstream value chain, we classify our potential negative impact to be moderate.

Chapter:

- **Water management**

Circular economy, waste & recycling

Value chain	**Upstream**	**Own operations**	**Downstream**
Positive impact:		✓	✓
Negative impact:	✓	✓	✓

Regarding circular economy, waste and recycling, we have strong mitigating measures in place. Beyond this, our Quantitative Green Chemistry Evaluator DOZN enables our customers to calculate the impact of a process or product using the 12 principles of green chemistry. Based on outcomes, a process or a material can be changed to help decrease the score. Furthermore, the investment activities of M Ventures may contribute to more sustainable production processes and products while supporting innovative business ideas. Partnerships with customers also help to develop more sustainable products and enable other industry players to act more sustainably. Therefore, we classify our potential positive impact on the topic of circular economy as well as waste and recycling to be moderate in our own business and to be substantial in the downstream value chain of our Life Science business sector.

The use of chemical and pharmaceutical products is associated with a high risk of improper use, improper disposal and, especially in developing countries, with weak waste management systems. For waste generated within our own operations, we mitigate negative impacts by adhering to regulations as well as fostering education, waste reduction and recycling initiatives. Therefore, we classify the potential negative impact in our upstream value chain and in our own business to be moderate. For the downstream value chain, we classify our actual negative impact as significant.

Chapter:

- **Waste & recycling**

Plant, process & transport safety

Value chain	Upstream	Own operations	Downstream
Positive impact:			
Negative impact:	✓	✓	✓

Our regulations and measures regarding plant, process and transport safety go beyond fulfilling local legal requirements. Our most important protective measure during storage and transport is our good quality and stable packaging. For the transport of dangerous goods, we only use tested packaging that meets the requirements of the Recommendations on the Transport of Dangerous Goods – Model Regulations (UN Orange Book). In our own business we classify our actual positive impact on the topic as low.

The pharmaceutical and chemical sectors are associated with a particular risk of pollution to air, soil and water through chemical spills. We have implemented strong standards and safe manufacturing practices at all sites worldwide to significantly reduce the risk of leakage into the environment at manufacturing locations during storage and transportation. Therefore, we classify our actual negative impact in the upstream value chain and in our own business to be moderate. In our downstream value chain, we classify the potential negative impact as moderate.

Chapter:

- **Plant, process & transport safety**

Biodiversity and ecosystems

Value chain	Upstream	Own operations	Downstream
Positive impact:			
Negative impact:			✓

To enhance biodiversity at our own sites, we have created several substitute habitats for flora and fauna. We classify the actual positive impact of these measures on the state of species and on the extent and condition of ecosystems within our own business to be low. Nevertheless, there is still a significant room for improvement in this area as it is necessary to extend our measures across the entire value chain.

Our production sites are predominantly located in industrial areas with low biodiversity value. Nevertheless, unintentional chemical leakages can contaminate soil or water resources and damage ecosystems. Due to our technical and organizational measures, we classify our potential negative impact on biodiversity and ecosystems to be low in our upstream value chain as well as in our own business; we classify it to be moderate in our downstream value chain.

Chapter:

- **Environmental protection**

The list of material topics did not change in comparison with 2022. In the analysis, “Tax Governance” once again fell below the materiality threshold. Nevertheless, we report on this topic as we expect tax-related disclosures to become increasingly important to our stakeholders. In addition, we provide information about our community engagement as we have been supporting and running a wide range of activities and campaigns for many years now. We would like to continue to play an active role in the community and to continue reporting on our outreach efforts.

Section 289c (3) of the German Commercial Code requires us to report on topics of double materiality in a combined **non-financial statement**. Pursuant to section 289c (3) of the German Commercial Code, the principle of double materiality requires companies to disclose non-financial information when the following two criteria are met: First, the information makes it possible to understand how the company’s business activities affect non-financial aspects. And second, the information is necessary to understand the company’s course of business, results of operations and economic position.

BUSINESS ETHICS

44 Corporate governance

- **44** Governance
- **46** Compliance management
- **51** Data protection & cyber security
- **53** Interactions with health systems
- **57** Tax governance

59 Suppliers

- **59** Supply chain management
- **64** Mica supply chain

67 Human rights

71 Clinical studies

77 Animal welfare

83 Bioethics

87 Digital ethics

Corporate governance

Governance

For more than 350 years, responsibility has been an integral part of our corporate identity. It is one of our six company values, alongside courage, achievement, respect, integrity, and transparency. We seek to balance environmental, social and governance aspects and find solutions for the world of tomorrow. Our actions serve all people who need our medicines or medical treatment, the companies we supply and the people or partner firms we collaborate with.

Our approach to responsible governance

The requirements we place on responsible corporate governance are derived from our **company values** on the one hand and from the regulations, external initiatives and international guidelines to which we are committed on the other hand. We integrate requirements such as these into our **sustainability strategy** and our **Group-wide guidelines**. These guidelines comprise **charters and principles** that are valid for the entire company as well as specific standards and procedures for individual business sectors and sites.

Some examples include: Our **Human Rights Charter** aligns with the **UN Guiding Principles on Business and Human Rights**. Our Group-wide **Social and Labor Standards Policy** reflects the labor standards of the International Labour Organization (**ILO**). Our **EHS Policy** (Corporate Environment, Health and Safety Policy) for environmental impact mitigation and health and safety forms the basis for implementing the chemical industry's **Responsible Care® Global Charter** within our company. Our standard entitled "Corporate Chemicals Regulations Governance" describes the processes and management structures required to ensure global compliance with the pertinent chemical and product safety regulations.

We endeavor to comply with all applicable laws as a matter of principle. Where necessary, we review our internal guidelines, standards and instruction manuals on compliant behavior and adapt them to reflect changes in the regulatory landscape.

Roles and responsibilities

Based on the requirements set forth in charters, principles and policies, our internal standards give specific guidance for operational processes. They are constantly updated by the relevant departments and are available on our intranet. Our managers implement these standards in their respective areas of responsibility and ensure that they are adhered to. In addition, we educate and train our employees on all guidelines that apply to them.

We employ **management systems** to steer processes and define goals, actions and responsibilities. These systems are based on standards such as the internationally recognized quality management standard ISO 9001, good working practices (GxP) in the pharmaceutical industry, and ISO 14001 for environmental management. Our company regularly undergoes **ISO 14001** and **ISO 9001** certification, which is conducted by an independent auditing firm. We hold group certificates for both standards.

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.
- 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 of companies, we are dedicated to improving the supply chain with respect to environmental, compliance and social standards.
- 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 Chemie**[3], 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.

Compliance management

Responsible entrepreneurship starts with compliance. We aim to ensure that all our activities adhere to relevant laws, regulations and ethical standards around the world. This also helps us to protect our reputation as an employer and business partner.

Our approach to compliance

As a global company, we have stringent requirements for effective compliance management. Importantly, we seek to emphasize compliance by acting in line with our **company values** and believe that profitable business operations should go hand in hand with the highest ethical standards.

Roles and responsibilities

Our Group Compliance function is responsible for the framework of the following core topics: the Merck Code of Conduct, anti-corruption and anti-bribery (including healthcare compliance, third-party due diligence, transparency reporting), anti-money laundering, and conflicts of interest.

To cover these topics, we have Group-wide policies, standards and procedures in place to ensure our business activities comply with the relevant laws, regulations and international ethical standards. Other compliance-related issues, including the respective internal regulations and guidelines, such as Pharmacovigilance, Export and Import Controls, and **Environment, Health, Safety, Security, Quality,** are managed by the responsible functions.

Our Group Compliance function is responsible for our **compliance portfolio**, which consists of the following elements:

- **Risk Assessment:** Identifying internal and external critical risks in regular business operations
- **Policies & Procedures**: Global policies, procedures and standards to mitigate identified risks
- **Compliance Committee/Forums:** Platform for compliance-related discussion and decision making, including relevant key functions
- **Training & Awareness**: Appropriate training and additional measures to educate and keep awareness high
- **Programs & Tools:** Comprehensive compliance programs and supporting tools contributing to internal controls and overall governance
- **Monitoring & Reporting:** Tracking of compliance-related data; perform internal and external reporting
- **Case Management**: Timely response to reports of misconduct and implementation of corrective actions
- **Continuous Improvement**: Based on and applicable to all compliance program elements

We continuously review our compliance portfolio and update our initiatives and programs where necessary. This approach reflects new requirements as well as internal and external risks, such as those resulting from amendments to legislation, relevant industry codes or changes affecting our company. Moreover, we discuss current compliance matters, trends and goals with our stakeholders, both internally within our Compliance organization and externally. We keep the focus on **our people** by ensuring the availability of appropriate resources and skills, maintaining clear roles and responsibilities and based on employee feedback, setting aligned and harmonized goals. We also want to ensure that our organizational structure is up-to-date and meets business needs.

Our Chief Compliance Officer reports on the status of our compliance activities, potential risks and serious compliance violations to the Executive Board and Supervisory Board twice a year at a minimum. As part of our regular reporting processes, we compile a comprehensive **compliance and data privacy report** annually for the Executive Board. This includes the status of our compliance program, continuous improvement initiatives and key figures on compliance and data privacy cases. Additionally, we prepare a mid-year update to highlight ongoing developments and the status of relevant projects and initiatives.

Our Chief Compliance Officer oversees all Compliance departments and the subordinate Compliance Officers and Compliance experts around the world. The Compliance Officers implement our compliance program within their respective areas of responsibility (adapting to local regulations) and receive guidance from our Group Compliance Center of Expertise. This is a centralized body that drives the design and evolution of our compliance program across all business sectors and Group functions.

Our commitment: Guidelines and standards

Our compliance program builds on our company values and integrates these into our compliance framework, which consists of Group-wide **policies, standards and procedures** for entrepreneurial conduct. The following are mandatory for all our employees:

- The **Merck Code of Conduct** guides our workforce in conducting business ethically – in line with our values and the law. It is available to all employees worldwide in 22 languages.
- Our **Human Rights Charter** supplements our Code of Conduct with globally recognized principles on human rights.
- Our **Anti-Corruption Standard** stipulates that all business activities must be conducted in line with applicable anti-corruption regulations and standards. All forms of bribery are strictly prohibited.
- Our global **Anti-Money Laundering Group Standard** defines and describes the internal global process and assurance measures to protect our company from being misused by third parties for money laundering or terrorist financing activities.
- Our **Conflict of Interest Policy** sets a framework to explain the nature of a conflict of interest and the related risks. It advises how to prevent these kinds of situations or how to set rules for identifying, disclosing, mitigating, and managing the risks that could arise from such situations.
- Our Group-wide **Antitrust and Competition Law Policy** states that all business activities across the Group must be conducted in compliance with applicable competition regulations at all times. We acknowledge the importance of fair competition and expect the same of parties acting on our behalf.
- Our new **Whistleblowing and Investigations Standard**, effective since July 2023, reinforces our commitment to maintaining and strengthening our “speak up” culture. The standard provides guidance on reporting potential violations and our procedures for investigating reports of misconduct while ensuring confidentiality and protecting whistleblowers.
- Additionally, we introduced a new **Supplier Code of Conduct** (SCoC) in January 2023 to replace our Responsible Sourcing Principles. The SCoC outlines our expectations and standards for suppliers and business partners regarding human rights, health and safety, business integrity, environmental protection, continuous improvement and managing their respective suppliers.

To maintain compliance, we annually review and compile a list of changes to the applicable laws and regulations and update the policies, standards and procedures accordingly. While for major countries we rely on external legal counsel to stay abreast of these changes, for other countries, we rely on our Compliance Officers. Our annual reviews also identify whether any corrective actions from investigations or internal audits require us to update our policies, standards or procedures.

Risk assessment

Proper compliance risk management is crucial to identify undetected risks and ensure our company remains protected. For this purpose, we have a compliance risk assessment process covering all of our business sectors. The assessment is based on a **comprehensive risk matrix** that improves objectivity and enables a data-driven risk approach. It focuses on bribery and corruption risks, illustrated through in-depth risk categorization and risk scenarios. It also utilizes country risk segmentation, classifying countries where we actively operate in terms of their risk exposure regarding bribery and corruption by applying objective and consistent criteria. We use the outcome as a model to prioritize initiatives and intensify activities in countries with higher risk levels.

The risk assessment follows a staggered approach focusing on global business units first, extending to high-risk countries and finishing with low-risk countries. After completing risk assessments in all countries, we align the top risks per country with our Global Mitigation Plan and Compliance Monitoring Scope to ensure we address all identified high-level risks with appropriate mitigation measures. In addition, we perform regular antitrust risk assessments in a separate process.

Conflicts of interest

We take all potential conflicts of interest seriously. Employees must avoid situations where their professional judgment could come into conflict with their personal interests. They must also disclose every potential conflict of interest to their supervisor and document the disclosure. Such issues are typically resolved directly between the employee and the supervisor but can also be routed to Human Resources, Legal, Compliance or other relevant functions.

In 2023, our conflict of interest e-learning course had a 95% completion rate.

In addition, as described in the Annual Report under **Avoidance of conflicts of interest**, Executive Board and Supervisory Board members are exclusively committed to the company’s objectives and neither pursue personal interests nor grant unjustified advantages to third parties.

We also actively prevent bribery by enforcing strict value limits for gifts and entertainment. These limits are embedded in the company tool we use to reimburse travel and expenses. All submissions are subject to an approval process, which includes an additional internal review if they exceed certain cost thresholds. Additionally, we have specific rules and procedures for dealing with healthcare professionals, as outlined under **Responsible interactions with health systems**.

Management and requirements of third parties

For compliance management to be effective, it must not be restricted to the boundaries of our own company. While our **supplier management processes** focus on vendor compliance with our standards, our **global Third Party Risk Management** process governs interactions with sales parties, such as commercial agents, distributors, dealers, and high-risk vendors. We expect our third parties worldwide to adhere to our compliance principles. We collaborate only with parties who pledge to comply with relevant laws, reject all forms of bribery, and adhere to environmental, health and safety guidelines.

We apply a risk-based approach to select the third parties with whom we do business. The greater the estimated risk regarding a particular country, region, or type of service, the more in-depth we examine the third party before entering into a business relationship. We also explore background information from various databases and information reported by third parties.

If we encounter compliance concerns, we further analyze and verify the relevant information. Based on the outcome, we decide whether to reject the potential third party, impose conditions to mitigate identified risks or terminate the existing relationship.

In 2023, we started implementing a new workflow-based process for third-party risk management. In addition to the existing high-risk categories, we introduced new general categories to strengthen our due diligence and legal compliance in all countries

Compliance training

We provide regular compliance training (both classroom and online) on our Code of Conduct and critical compliance topics such as anti-corruption, conflict of interest, antitrust, data privacy, anti-money laundering and healthcare compliance standards. We require employees to take these courses based on their exposure to risk. Some courses also apply to independent contractors and supervised workers, such as temporary employees.

We also continually update our training curricula and adapt them to new developments. These efforts ensure we continuously educate our employees on existing and new compliance requirements, guidelines and projects.

In 2023, we launched a new Anti-Corruption, Anti-Bribery and Anti-Money Laundering e-learning course based on the updated Global Anti-Corruption and Anti-Money Laundering standards introduced in 2022.

Anti-money laundering

We have implemented a global **anti-money laundering** (AML) program consisting of a global Anti-Money Laundering Group Standard, training and a dedicated process to report and investigate red flags and any high-risk transactions. Suspicious transactions are reported to the German Financial Intelligence Unit or other authorities as required.

We continuously work to improve our AML program. Following in-depth AML risk assessments of jurisdictions with stricter regulatory frameworks than our AML program, we implemented additional local AML programs where required.

Reporting potential compliance violations

We encourage all employees worldwide to report potential compliance violations. Depending on the type of misconduct and the reporting person’s preference, they can choose from various reporting channels. We recommend using one of our central channels that are directly received and reviewed by a dedicated, independent and qualified team within Group Compliance. Depending on the nature, content and type of report, Compliance may investigate a submission directly or assign it to another responsible function for further investigation. One central reporting channel is our global whistleblowing compliance hotline, which can be used **free of charge and anonymously** to report violations. It is available in several languages by telephone or a web-based application.

The compliance hotline is also available to external stakeholders. The relevant information can be found in the “contact us” and the Compliance and Ethics section of our **website**.

Compliance-relevant cases with a particular risk profile are presented to the Compliance Case Committee, comprising senior members of our Compliance, Legal, Data Privacy, Internal Auditing, and Human Resources departments. The Committee’s duties include assessing and classifying specific compliance issues and addressing identified issues using appropriate measures.

In all Compliance-relevant cases, based on the investigation outcome and recommendations from Compliance or the Compliance Case Committee, we aim to take **appropriate remediation measures**. These can include disciplinary actions against employees who have committed a compliance violation. If the investigation identifies a root cause that could lead to the risk of further compliance violations, we take additional preventive and corrective actions.

Both the number of new Compliance-relevant cases and the number of cases with confirmed compliance violations increased compared with the previous year. In 2023, 106 Compliance-relevant new cases with reports via the compliance hotline and other channels were created. In 32 concluded cases, it was confirmed that the principles of the Code of Conduct or other internal or external guidelines had been violated.

Compliance audits

Compliance is ensured by Group Compliance and Group Internal Auditing as the second and third lines of defense. As part of the audits, Group Internal Auditing regularly reviews functions, processes and legal entities worldwide. These reviews include an assessment of the **effectiveness of the respective compliance guidelines**, processes and structures in place. The units also check for violations of our Code of Conduct, Anti-Corruption Standard, Anti-Money Laundering Group Standard, and Antitrust and Competition Law Policy.

Our audit planning aims to provide **comprehensive risk assurance** through the best possible audit coverage of our processes, countries and projects. We take a risk-based approach to our annual audit planning process, considering factors such as sales, employee headcount, systematic stakeholder feedback and the Corruption Perceptions Index (**CPI**) published by the non-governmental organization **Transparency International**. If an internal audit gives rise to recommendations, Group Internal Auditing performs a systematic follow-up and monitors the implementation of the recommended corrective actions. In 2023, Group Internal Auditing conducted 80 internal audits involving bribery and corruption-related risks, including 52 operational and 27 IT audits and 1 special audit which may be conducted to meet legal requirements.

External Certification of Compliance Management System

In 2022, we initiated an external review and certification of our Compliance Management System (CMS). The focus is on anti-bribery, anti-corruption and anti-money laundering to identify potential areas of improvement and to assess whether the measures we have taken ensure that regulations, policies and processes are adhered.

The CMS assessment started in November 2022 and will cover three phases until August 2025. The first two phases, pre-assessment and adequacy assessment, were completed by the second quarter of 2023 with positive results. They indicate that the processes and measures in our CMS are adequately designed and implemented to manage our compliance risks. We have also designed and implemented our CMS to identify significant rule breaches in advance and prevent any violations during assessments. The third phase, effectiveness assessment, will be conducted region by region until 2025.

Engaging stakeholders

We are members of various organizations, including the German Chemical Industry Association (**VCI**), the German Institute for Compliance (**DICO**), the European Federation of Pharmaceutical Industries and Associations (**EFPIA**), the German Association of Voluntary Self-Regulation for the Pharmaceutical Industry (**FSA**), the International Federation of Pharmaceutical Manufacturers and Associations (**IFPMA**), the **Alliance for Integrity**, the German Association for Supply Chain Management, Procurement and Logistics (**BME**), and the International Association of Privacy Professionals (**IAPP**).

Data protection & cyber security

Compliant handling of information is highly important for a leading innovative, science- and technology-driven company. When using personal data, the individuals' rights must be appropriately protected. We strive to safeguard the rights of any person whose data we process, including but not limited to our employees, patients, customers and healthcare professionals. When it comes to cyber security, our company understands the importance of protecting our business from cybercrime and ensuring our information is secure from any associated internal and external risks.

Our approach to data privacy

The mandate and goal of our Group Data Privacy unit is to mitigate risks and create a global framework for **data privacy-compliant business operations**. This unit helps train our employees to handle data responsibly and with clear accountability. It safeguards our company by providing data privacy risk assurance and ensuring compliance with relevant data privacy laws globally. Group Data Privacy also contributes to creating value for the development of digital business models.

Our data privacy management system

In mid-2023, we completed the implementation of the core elements of our global and consistent data privacy management system (DPMS). Our DPMS applies similar elements to the **compliance portfolio** but adapted to our data privacy needs, including policies and procedures, risk assessments and documentation, training and awareness, programs and tools, individual requests, monitoring and reporting, and incident management as well as continuous improvement.

Our approach to cyber security

It is of critical importance to our business to protect our information systems, their contents and our communication channels against any criminal or unwanted activities. These include e-crime and cyberattacks, such as unauthorized access, information leakage and misuse of data or systems.

Information security risk assessments are conducted as part of our project management process for all relevant projects. Additionally, existing applications classified as "severe" or "high-impact" assets undergo this kind of risk assessment. The results are monitored by the Cyber Security organization through an internal cyber risk register. If cyber risks are identified, risk treatment strategies are agreed together with the respective asset owners and tracked until completion. Identified cyber security risks are reported in aggregated form to the Executive Board twice per year through our enterprise risk reporting.

Roles and responsibilities

Group Data Privacy is an independent function, organizationally integrated into Group Compliance and Data Privacy. We have a Group Data Privacy Officer and a network of local Data Privacy Officers at various sites Group-wide. In line with external regulations, the Data Privacy Officers and their respective teams act independently and without receiving internal or external instructions. Group Data Privacy regularly prepares **data privacy updates** and a comprehensive data privacy report. This report is submitted to the Executive Board and the Supervisory Board.

Cyber security is part of our Group Corporate Security Office. In addition, we have a Group Chief Information Security Officer and a network of Information Security Officers within the business sectors and Group functions who hold risk ownership, act as our first line of cyber security defense and are supported by dedicated networks. Our global Cyber Security function acts as a second line of defense and has responsibilities regarding cyber security risk governance and oversight. Our third line of defense consists of internal audits.

Our Cyber Security organization strengthens resilience against cyberattacks and **data breaches**. It defines policies and standards for cyber security (including data security) while providing oversight, tools and systems to manage and monitor our overall cyber security risk exposure. The organization is also responsible for providing cyber security monitoring and incident response capabilities across the entire company. Additionally, we train our employees on how to protect data properly.

Our commitment: Guidelines and standards

Data privacy framework

Our Data Privacy Policy and the corresponding standards and procedures define our principles for processing personal data. This approach allows us to achieve a **high level of data protection** for our employees, contract partners, customers, and suppliers as well as patients and participants in clinical studies. Our Group-wide understanding of data privacy is based on European legislation, in particular the European Union General Data Protection Regulation (EU GDPR). We are also taking steps to meet local data privacy requirements, where these are stricter than our Group-wide standards.

Cyber security framework

Our Group cyber security governance framework contains organizational, process-related and technical information security countermeasures based on recognized international standards. In addition, we **apply harmonized electronic and physical security controls** (e.g. access controls and security monitoring) to bolster our ability to securely handle sensitive data, such as trade secrets.

Data privacy training and IT tools for documentation

In line with the EU GDPR and our global approach to data privacy, we regularly conduct **e-learning training courses** in ten languages. In 2023, the completion rate for our **e-learning courses** was 99%. Additionally, local Data Privacy Officers support the execution of our Group-wide training plan by conducting training for specific target groups on request. Furthermore, we reinforced the importance of data privacy to all employees by promoting Data Privacy Day in 2023 via our internal communication channels.

We maintain a central IT tool to provide a single source for data privacy processes, such as registering data processing activities and reporting potential data privacy incidents. In 2023, we reported seven cases of minor personal data breaches to the supervisory authority. One of them related to identified data leaks, theft, or loss of customer data. However, none of these cases were sanctioned.

Cyber security awareness

The Cyber Security organization has established multiple campaigns – in addition to the mandatory IT Security Awareness e-learning training – to ensure a high level of awareness among internal and external employees. One example is the **cyber hero campaign**, which features a series of videos demonstrating how to apply information security effectively through real-life examples. In addition, all employees receive monthly phishing e-mail simulations to help them identify and report potential attempted breaches in an interactive way.

Responsible interactions with health systems

It is important that healthcare stakeholders, such as research institutes, healthcare professionals and patient and carer organizations, have access to up-to-date information on diseases and treatments while safeguarding their independence at the same time.

Our approach to interacting with health systems

We support health systems by collaborating with our healthcare stakeholders, such as professional medical associations, patient and carer organizations, university clinics and other institutions that provide healthcare. We follow clearly defined **internal approval requirements** and procedures for each type of interaction, in line with applicable laws and codes. In countries with statutory or industry obligations on the disclosure of transfers of value to healthcare stakeholders, we aim to comply with these obligations.

We are committed to adhering to all regulations concerning the promotion of pharmaceutical products. In most markets, pharmaceutical companies are permitted to advertise prescription medicines only to healthcare professionals, such as physicians and pharmacists. These promotional activities must always disclose the active ingredient, potential adverse effects and contraindications of the medicine. Our aim is to apply **high ethical standards**. Our internal governance documents on the promotion of pharmaceutical products are part of our Group-wide healthcare program, which requires us to conduct business in compliance with the law and industry obligations. We regularly review all our internal governance documents and revise them as required in response to any new developments.

We clearly differentiate between information-sharing activities and promotional activities. The former are activities where we share scientific information but have no intention of promoting or increasing the sales of pharmaceutical products. The latter are activities with a clear intention to promote or increase sales of pharmaceutical products. The differentiation is critical for various internal policies and standard operating procedures, responsible functions, and levels of review and approval.

In some countries we inform consumers directly. For example, in the United States direct-to-consumer (DTC) advertising for prescription medicines is permitted. In line with applicable local laws, we use DTC advertising in these countries to help increase people’s awareness of certain diseases and the available therapies. In doing so, we aim to empower patients to **make informed decisions** about their own treatment.

Roles and responsibilities

For all interactions with healthcare stakeholders, we have established internal policies and **review processes and tools**, such as record-keeping systems. Thereby, we want to ensure adherence to statutory requirements and transparency obligations.

Our Global Regulatory Affairs unit has established a dedicated standard and corresponding process document on the review and approval of our promotional materials for our Healthcare business sector. At the operational level, the relevant business and all employees involved in our sales and marketing activities must adhere to our internal policies, standards and procedures.

To ensure that all promotional materials meet our standards as well as local regulations end-to-end, we apply a harmonized **Group-wide review and approval system**. In our Healthcare business sector, we use a single global software tool. This has enabled us to unify, simplify and monitor the review and approval process for promotional materials and monitor that process in accordance with the dual-control principle. If the material

has promotional intent and is product-related, a review is conducted by our Medical, Legal and Regulatory functions. This also helps us identify opportunities for improvement. All employees involved in creating, reviewing and approving promotional materials undergo training on the current process for reviewing, approving and decommissioning promotional materials based on our principles and standards.

Our commitment: Group-wide guidelines and industry standards

In addition to applicable laws and our own internal standards, we also strive to comply with the codes of conduct of various international industry organizations, such as the **Code of Practice** published by the International Federation of Pharmaceutical Manufacturers & Associations (**IFPMA**) and the Code of Practice of the European Federation of Pharmaceutical Industries and Associations (**EFPIA**).

We are also members of various local industry associations, such as the German Association of Voluntary Self-Regulation for the Pharmaceutical Industry (**FSA**) and the U.S. Pharmaceutical Research and Manufacturers of America (**PhRMA**). Our activities are aligned with the associations' codes for collaboration between healthcare professionals and the pharmaceutical industry.

Our Group-wide Pharma Code for Conducting Pharmaceutical Business and Pharmaceutical Operations (Pharma Code) defines the general compliance for our activities in the Healthcare sector. It provides high-level and overarching principles that govern our interactions with physicians, medical institutions, and patient and carer organizations, along with our promotional practices.

Our **Healthcare Ethical Guiding Principles** supplement the Pharma Code and guide our Healthcare employees with six ethical principles for decisions and activities specific to the particular challenges and responsibilities of this business sector.

Under the umbrella of our Pharma Code and Healthcare Ethical Guiding Principles, we have specific governance documents, procedures and tools for different types of interactions with healthcare stakeholders, covering topics such as service engagements, hospitality, payments (at fair market value), donations and sponsorships to participate in events.

Our **Standard on Medical Activities** provides the general principles and requirements that must be respected in all medical activities, including interactions with healthcare providers. The specific governance for the different types of activities and interactions is detailed in further policies and standards, standard operational procedures and other governance documents.

Collaborating with patient and carer organizations

We seek to improve patients' quality of life, which is why we support the work of patient and carer organizations. In turn, these organizations provide patients, family members and caregivers with information on disease management as well as educational and advocacy resources.

Our Policy on Interactions with Patients, Patient Opinion Leaders and Patient Organizations provides a comprehensive framework for our interactions with these key stakeholders. Our guideline entitled Good Practice and Process Guidance: Engagement with Patients, Patient Opinion Leaders and Patient Organizations provides additional guidance for our interactions with these stakeholders. It reflects our commitment to prioritizing patient well-being and guides appropriate patient/caregiver engagement that enables our patient-directed approach. Through this policy, the supplementary guideline and specific local policies, we provide a robust guidance structure to support our employees in remaining compliant throughout their interactions with patients, patient opinion leaders and patient organizations.

Supporting medical education

To contribute to medical advances that benefit patients, we support non-promotional medical education programs worldwide by funding independent third-party medical education providers including medical societies and academic organizations. We also organize company-led medical education programs. We take an **ethical, transparent and responsible approach**, providing fair and balanced content that allows the expression of a diverse range of theories and recognized opinions.

All requests for independent medical education funding are subject to an approval process through our R&D and Compliance functions, in line with our Standard on Medical Education Funding. This process ensures all funds granted for medical education programs comply with our internal guidelines and criteria as well as all applicable laws and industry codes.

In addition, we partner with industry associations, such as the Global Alliance for Medical Education (**GAME**) and the International Alliance for Continuing Medical Education (**iPACME**). We are also an active member of the relevant working groups established by the European Federation of Pharmaceutical Industries and Associations (**EFPIA**) and the Medical Affairs Professional Society (**MAPS**). Together with these associations, we discuss ways to harmonize and improve quality standards for medical education.

Transparent reporting

We publish the financial and non-financial contributions we make to healthcare stakeholders in the healthcare industry, such as healthcare professionals and healthcare organizations, as appropriate and in accordance with local laws and codes. The published information includes the names of individual recipients, their addresses, the purpose, and the contributed amount or value as required by the applicable laws and codes. In addition, before publishing, we secure all necessary informed consent forms, as required by the applicable data privacy regulations.

In addition to disclosing monetary transfers of value on an individual level, we continue to **publish overall spending** on our **research and development** activities, as required.

Apart from disclosing transfers of value to healthcare professionals and healthcare organizations as required, we ensure transparency on our voluntary unsolicited donations to European patient organizations by publishing the contribution details on our **website**. The report is updated annually and includes all amounts, recipients and the purpose of each transfer of value, thus also meeting **our obligation** as an **EFPIA** member.

Regular employee training

In 2023, we continued our Code of Conduct training curriculum on managing **dilemmas in sector-specific situations**. This comprehensive and interactive training course seeks to improve participants' awareness and understanding of relevant dilemmas, such as overhearing a conversation that may or may not constitute attempted bribery. The training program was successfully implemented in all countries in which our Healthcare business sector operates.

Moreover, employees who are responsible for the promotion of our pharmaceutical products receive regular training on current guidelines. This applies to individuals in sales, marketing and functions that work directly with healthcare providers. We conduct these seminars either locally in a classroom setting or as e-learning courses.

Depending on their roles and responsibilities, new employees participate in **onboarding training** dealing with the review and approval of promotional materials. Additionally, employees in charge of marketing and promotion of pharmaceutical products can also access our respective guidelines on our corporate intranet.

Based on their roles and responsibilities and in order to remain up-to-date, employees participate in mandatory e-learning courses and classroom training on our policies and guidelines as well as important changes to the reporting requirements for transfers of value.

Tax governance

Our company operates in a complex legal environment and is subject to various tax obligations due to its domestic and foreign business activities. It is our responsibility to ensure compliance with tax legislation in all countries in which we operate and to be transparent. To this end, we have a tax organization in place that clearly defines responsibilities, processes and controls.

Our approach to taxes

We believe that fair taxation serves as a backbone of any functioning society. Therefore, we expect public authorities to take transparency, predictability and non-discrimination into consideration when implementing taxation measures. We understand that tax is embedded in almost every aspect of commercial operations and our company therefore acts as a **responsible taxpayer** with respect to the following objectives:

- Ensuring timely and proper execution of tax obligations;
- Securing material correctness of tax positions determined in the annual financial statements and tax declarations;
- Ensuring effective tax **risk management** and tax monitoring;
- Avoiding inappropriate structuring leading to benefits not provided for by tax law.

Roles and responsibilities

Taxes are managed in different units. Group Tax is generally responsible for tax matters of Merck KGaA and provides tax standards for the Merck Group – with the exception of customs, consumption tax and wage tax. The Export Control and Customs Regulations unit within the Corporate Sustainability, Quality and Trade Compliance (SQ) function is responsible for customs and consumption tax. Human Resources is responsible for wage tax.

The Group Chief Financial Officer (CFO) is responsible for the Group Tax function. She delegates her tasks related to tax matters to the Head of Group Tax. The Head of Group Tax is also responsible for defining the organizational structure of the function, for monitoring it on an ongoing basis and for adapting it if necessary. In addition, the local tax unit in the United States reports directly to the Head of Group Tax.

At the subsidiary level, the local CFO is generally responsible for tax matters, managed either by local tax units, by external advisors, or, for Germany and our U.S. subsidiaries, by Group Tax. The local CFOs report to the regional CFO. The regional CFOs ultimately report to the Head of Merck Business Services, who reports to the Group CFO. If no local CFO is assigned, the tasks are undertaken by a designated employee in the Finance unit.

Tax-related compliance topics can also be reported through our **compliance hotline**, our Group-wide whistleblowing system.

Our commitment: a tax principle

Our **Tax Principle** is part of our **tax internal control system**. It represents the framework and minimum requirements for all tax-relevant processes, methods and structures within our company. This principle

- outlines the tax compliance culture within the Group;
- defines our tax compliance objectives;
- specifies the organizational framework for tasks, roles and responsibilities, which ensures compliance with tax rules within the Group;
- establishes basic rules for the exchange of tax-relevant information.

The Tax Principle is issued by Group Tax and applies to the entire Group. It is reviewed it at least once a year and modified if necessary. Should extraordinary events occur, such as changes to the business strategy, organizational structures or risk management processes, the principle is reviewed on an ad hoc basis and adapted as appropriate. The Head of Group Tax is responsible for annual and ad hoc reviews as well as modifications to the principle. Any material modifications are discussed and coordinated with the Group CFO.

Suppliers

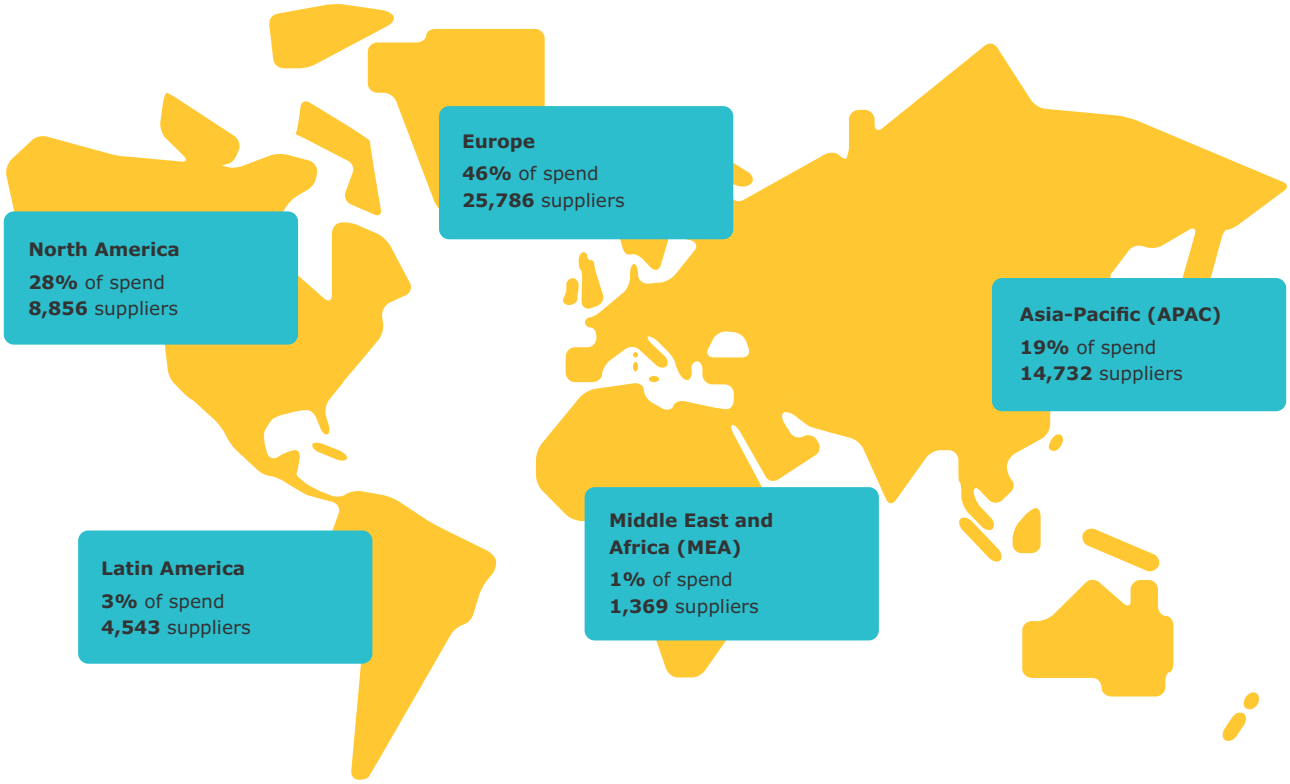
Sustainable supply chain management

Our company procures many raw and packaging materials, technical products, components, and services from around the world. We expect our suppliers to respect our ethical, social and compliance standards and apply these to their own supply chains.

Our approach to sustainable procurement

In 2023, the total value of the goods and services we purchased from around **55,000 suppliers** in more than 140 countries was approximately € 9.8 billion, compared with approximately € 10.2 billion in 2022, representing a decrease of 4.5%.

Supplier spend and suppliers per region – 2023[1]



[1)] For data processing reasons, 2% of our suppliers (1,161 suppliers) are currently not assigned to any purchase region. This equates to 3.5% of our supplier spend

With our supplier management endeavors, 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. Unless stated otherwise, the approaches presented apply to tier-1 suppliers, i.e. direct suppliers. Furthermore, our supplier management activities include special measures particularly for tier-n suppliers, i.e. indirect suppliers, working in the area of conflict minerals.

To achieve our **sustainability goals**, our 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 reviewing the **sustainability performance of our relevant suppliers** based on 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. In accordance with our risk management approach, we define relevant suppliers as suppliers, which either indicate a specific country and/or industry risk or contribute to a significant percentage of our supplier spend (at least 50%). For the country risk evaluation, we have developed our own comprehensive country risk score.

In 2023, 66% (2022: 46%) of our relevant suppliers were covered by a valid **sustainability assessment**; 94% (2022: 82%) of our spend attributable to these suppliers was covered by suppliers with a valid sustainability assessment.

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, such as the German Supply Chain Due Diligence Act, and initiate corresponding measures where necessary. Among other things and in conjunction with the implementation of the German Supply Chain Due Diligence Act, we have implemented a risk management approach focusing on human rights and environmental risks along our supply chain. This risk assessment is conducted annually and ad-hoc when required.

Our Supplier Decarbonization Program is a key element of achieving our **Science Based Target**. Through the program, we aim to **reduce greenhouse gas emissions** associated with purchased goods and services as well as capital goods. More details on this program can be found **here**; more information on our climate-related targets can be found under **Climate action**.

Risk management process

To ensure security of supply, we select our suppliers based on criteria such as country risk, material risk, supplier risk, and their strategic importance to the business. This process helps our Category Sourcing teams to identify potential mitigation actions with relevant suppliers and supports them in making improvements. Our risk management approach comprises four main elements:

- **Supplier Risk Assessments**: to capture the overarching risks at the supplier level we consider multiple risk domains.
- **Alert system**: to notify our Procurement organization about risk events arising with any of our suppliers.
- **Material Risk Assessments**: to identify and mitigate the risks of the materials used in our most significant finished products. This element focuses on our business sector Life Science. In 2023 we conducted assessments for more than 2,500 of our critical materials.
- **Risk Response Tracker**: a system to create and monitor risk mitigation activities in inter-disciplinary teams.

We calculate risk factors for suppliers and raw materials by multiplying risk probability and risk impact according to current human rights risk standards. We also include criteria for identifying supplier relationships

impacted by **key sustainability risks**, such as mineral sourcing and animal welfare. In 2023, we conducted further initiatives to support our supply continuity including second source qualifications, regionalization of supply and financial support to suppliers under special circumstances, among others.

Due diligence process for responsible sourcing of minerals

We source and sell products that contain minerals commonly referred to as “3TG” (tin, tungsten, tantalum, gold – collectively also known as conflict minerals). These minerals involve the risk of being extracted, traded, handled, and exported from conflict-affected and high-risk areas (CAHRAs) where human rights are not always respected and violations thereof need to be prevented.

Our company operates in global and complex supply chains, in many cases with several tiers of suppliers between us and the original sources of the minerals used in our products. To address the risk of this complexity, we are a member of the Responsible Minerals Initiative (RMI). RMI provides us with tools and resources to make sourcing decisions that improve regulatory compliance and support responsible sourcing of minerals from CAHRAs.

Our aim is to source materials in a responsible and conflict-free manner and not to contribute to adverse impacts through our activities. Therefore, we have a due diligence program that applies across all our business sectors and takes into account applicable laws and international standards. Additionally, we have engaged an external auditing firm to carry out an **independent assessment** in 2023 in order to verify our compliance with regard to the requirements of the EU Conflict Minerals Regulation (EU) 2017/821.

As part of our continuous improvement efforts, we worked on the recommendations from the audit and refined our procedures. Additionally, we established a supply chain traceability system that further increases our supply chain transparency. For our tin imports, which make up the majority of our conflict minerals imports, additional control mechanisms were implemented. These mechanisms include supply chain mapping, information on the country of origin of the mineral, request of audit reports from smelters and refiners, and the revision of agreements, including audit rights, with our suppliers. After careful analysis of the potential risks, no specific risks could be identified that would have required the development of an action plan. We remain in constant contact with our suppliers, industry colleagues and cross-company collaborations to improve the transparency and effectiveness of the framework.

Roles and responsibilities

Procurement is responsible for integrating sustainability requirements into the relevant stages of our sourcing and supplier management processes. Our Center of Excellence for Sustainability coordinates the relevant measures, such as updating our guidelines where necessary, examining processes and coordinating our participation in external initiatives. Category Sourcing teams responsible for selecting and contracting suppliers are made aware of and regularly updated on our **guidelines and sustainability requirements** through internal communication channels and training.

Our commitment: Guidelines and standards

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. For this purpose, our **Supplier Code of Conduct** 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.

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 on the basis of 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**). We call on our suppliers to allow us or trusted partners to conduct assessments or audits to increase the transparency of our supply chain and identify fields of activity to improve sustainability performance or mitigate infringement risks. Regarding our **mica supply chain**, we engage with a global consultancy firm to conduct audits and the Indian organization **IGEP** to conduct inspections.

Supply chain assessments and audits

Together for Sustainability supplier assessments and audits

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 175 countries and more than 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. The results are shared among TfS member companies in compliance with all restrictions stipulated by antitrust law.

Through the TfS initiative alone, we have access to 1,860 valid scorecards on the assessment of our suppliers (2022: 1,700), almost 1,790 of which completed a new assessment or re-assessment in 2023 (2022: 1,100). In some cases, these were initiated by us and in other cases by other TfS members.

In 2023, we continued our collaboration with member companies in TfS workstreams. We contributed to several best practice sharing and collaboration formats such as the TfS Talks as well as TfS Coordinator Roundtable. We also introduced the **TfS Product Carbon Footprint (PCF) Guideline** and rolled it out to employees of TfS member companies, our employees, our suppliers and other stakeholders. This comprehensive guideline harmonizes PCF calculation methodology across the industry. We helped to establish the pilot system of the TfS PCF data-sharing solution. This digital platform enables TfS members and their business partners to safely share product carbon footprint data.

Supplier Decarbonization Program

Our cross-functional Supplier Decarbonization Program team within Procurement is driving the execution of a ten-year program as part of the decarbonization strategy that was defined in 2021. In 2023, we continued to provide training sessions and materials for Category Sourcing Teams and engaged further with suppliers by sharing information about our climate targets. Follow-up discussions were again held based on the supplier answers to our supplier decarbonization questionnaire to assess the current decarbonization status and progress made since last year. To obtain more detailed information from our suppliers taking part in the program, we developed a **new supplier questionnaire** in 2023. This allows our Category Sourcing Teams to collate relevant supplier data in **a global monitoring database**.

In order to manage the large quantities of data on the CO_2 emissions of our suppliers, we have an automated carbon accounting tool in place to which we continuously add new functionalities. We offer our suppliers access to solutions to reduce their Scope 2 emissions. This includes a **renewable electricity supplier toolkit** with tips and in-house best practices on renewable electricity, which is available for free download from our **website**. In

addition, **we joined the Energize program** as a new sponsor. Energize is a collective initiative by a group of industry-leading pharmaceutical and fine chemical companies that have committed themselves to engaging their suppliers to support the adoption of renewable energy and reduce greenhouse gas emissions within their common supply chains. We offer all our suppliers the opportunity to join the program for free and to find out more about renewable electricity options leading to reduced Scope 2 emissions.

Supplier diversity

In the United States, we have a specific supplier diversity program in place to not only comply with local legislation, but also to enhance our company culture. We are focusing our efforts in the United States on enhancing our current **supplier locator tool** by broadening the rollout among sourcing managers to improve our ability to connect with and potentially award business to a wide range of vendors. Additionally, we continue to work on internal awareness campaigns and training seminars for our sourcing managers and are expanding our database of small and diverse vendors in collaboration with our tool provider. In the reporting year, we were able to increase the proportion of orders placed with suppliers classified as diverse. At the beginning of the program, we focused on the sourcing category Marketing & Sales and the category Procurement of Services in the USA. We have since expanded the program to all three business units, including the logistics category. We intend to include additional countries and direct spend categories (e.g. raw materials) in the coming years.

Ambassadors for sustainable procurement

We are active participants and contributors to the **Sustainable Procurement Pledge**, a TfS initiative established out of the social network LinkedIn in 2019. Since then, it has evolved to become a knowledge exchange platform for procurement professionals, academics and other stakeholders, hosting various online best practice exchange events.

Mica supply chain

Mica is an important raw material for our effect pigments, which are used in automotive, cosmetic and industrial coatings as well as plastics. We procure the majority of our mica from the Indian states of Jharkhand and Bihar. We have special measures in place to comply with high social and environmental standards in our mica supply chain.

Our approach to responsibility in the mica supply chain

In procuring mica from the Indian states of Jharkhand and Bihar, where social and economic factors contribute to poor working conditions, including child labor, we are supporting this region by safeguarding local employment and livelihoods. We source the raw material only from suppliers operating in formal working environments and we monitor compliance with our standards, including the prohibition of child labor.

Our mica suppliers are informed of our standards and have confirmed that they adhere to the principles of our **Human Rights Charter** as well as the requirements of our **Supplier Code of Conduct**. In the event of non-compliance with our standards, we work with suppliers to ensure the appropriate implementation of corrective measures.

We do not tolerate child labor and contractually prohibit our suppliers from employing children. If one of our suppliers were found to be using child labor, we would terminate the business relationship immediately. We are driving initiatives and taking measures to improve the conditions of mica sourcing based on our high standards. For example, we have contractually agreed with our suppliers to pay at least living wage to mine workers and workers in the processing units. Furthermore, we continuously review our monitoring processes to improve their effectiveness.

Roles and responsibilities

Group Procurement has overall responsibility for sourcing mica. A steering committee is in place to involve the relevant functions and inform the respective Board members about significant developments.

We have direct business relationships with suppliers for our mica supply chain in India in place. Our procurement unit is in direct contact with suppliers to reiterate the importance we place on ethical, social and environmental standards.

Our commitment: Compliance with guidelines and standards

As a signatory to the **United Nations Global Compact**, we are actively involved in working to abolish child labor. Our **Human Rights Charter** underscores this commitment. In our **Supplier Code of Conduct**, we set out our expectations for our suppliers in terms of sustainability and human rights, including prohibition of child labor. Our Supplier Code of Conduct is also an integral part of our supplier contracts.

Auditing our mica supply chain

We have implemented a series of oversight mechanisms using a system that monitors and audits conformity with our social and environmental standards. In addition to visits by our company’s employees, regular inspections are conducted by third parties, who conduct comprehensive announced audits as well as frequent, unannounced monitoring.

External audits

Environmental Resources Management (**ERM**), a leading global provider of environmental, health, safety, risk, and social consulting services, conducts external audits of mines and processing plants, investigating working conditions as well as **environmental, health and safety issues**. The audit reports document any identified shortcomings in this respect and propose corrective actions. Findings concerning safety of electrical installations and installing proper emergency exit signs were successfully addressed. Our employees in Kolkata, India, and Darmstadt, Germany, take action to address any identified issues. If the corrective measures are not respected, we may suspend or even terminate our business relationship.

Unannounced inspections

Since 2013, IGEP Consult, an Indian non-governmental organization, has conducted regular unannounced monitoring to review labor standards throughout our supply chain. During these visits, IGEP officials monitor occupational safety and **compliance with laws preventing child labor**. In 2023, its inspections focused on checking the availability of physical examinations for workers and conducting mock fire drills. Additionally, we regularly optimize the escalation process together with IGEP, which holds bi-weekly review meetings with representatives of our company to assess suppliers. These meetings help to identify any required actions, which our sourcing teams then discuss and implement with our suppliers. As a result, our suppliers have successfully improved the working conditions at these sites.

Evaluating and tracking mica sources

We use a tracking system to help ensure that the mica we purchase is derived from sources **qualified by our company**. We also use this tracking system to monitor the productivity of our mica sources. Based on written records of the daily extraction quantities, we review the volumes of mica reported and supplied to the processing facilities. Furthermore, we use a digital traceability solution to increase transparency in the mica supply chain.

To maintain accuracy, our processes undergo constant review and improvement. We are also evaluating other mica sources in accordance with our quality, social and environmental standards, both in India and other regions. For example, we source a considerable amount of mica from Brazil. To monitor our suppliers' adherence to these standards, we have conducted an audit through a third party.

Implementing living wages

We have contractually agreed with our suppliers a monthly wage of 17,500 Indian rupees for mine workers and workers in the processing units for their labor. In 2023, the workers in processing units and mines in our supply chain already received the aforementioned fixed salary, independent of mica volumes harvested or processed. This salary is a living wage that contributes to a reasonable living standard for workers and their families while helping to eliminate the root cause of child labor.

Community outreach in the mica supply chain

We are working to improve the **living conditions of the families** in mica mining areas. Since 2012, our educational efforts in Jharkhand include funding three schools with currently around 470 students as well as five vocational training centers, all run by our local partner, the NGO IGEP. At a fourth school operated by one of our mica suppliers, we provide on an annual basis scholarship for 200 children out of the 450 enrolled at the school.

In addition to our support for education, we are also helping to improve **access to healthcare**. For example, we are fully funding an IGEP-operated health center in Sapahi, Bihar, that serves approximately 20,000 residents in the local region.

Stronger together: Joint action in the mica supply chain

We are also a founding member of the multi-stakeholder group Responsible Mica Initiative (**RMI**). Since 2017, we have held the presidency of the organization. The initiative aims to eradicate child labor and unacceptable working conditions in the Indian mica supply chain by **joining forces across industries**.

During the reporting year, we continued supporting the RMI's work, as described below.

Responsible workplace standards:

- The RMI conducted training sessions with supervisors and workers in several mica processing units.
- An RMI-facilitated audit program on workplace standards continued in 2023. We actively supported this audit program and provided assurance that the processing units we source from would participate throughout 2023.

Community empowerment:

- The RMI aims to address the root causes of child labor and improve livelihoods within local communities. The RMI's scope covers 180 villages and reached over 16,000 households with 90,000 beneficiaries in 2023.
- In 2023, the RMI set the goal for its members to implement a living wage for all mica workers in the States of Jharkhand and Bihar by 2030.

Human rights

As an international corporate group, we have a duty to respect human rights worldwide within our respective sphere of influence and we strive to ensure that our business activities do not infringe upon these rights. By fulfilling our human rights due diligence obligations, we meet our responsibility to society and for adhering to legal requirements, for instance the German Supply Chain Due Diligence Act. At the same time, this enables us to remain competitive over the long term.

Our approach to human rights due diligence

We are committed to upholding human rights, which is why we became a signatory to the **UN Global Compact** back in 2005. We endeavor to prevent the risk of human rights violations as far as possible, not only at our own sites but also along our entire supply chain. That is why we integrate human rights due diligence into our business processes. Our approach to human rights due diligence encompasses six main components.

Our human rights due diligence process

We view our human rights due diligence as a **continuous process**, which we constantly adapt and improve. This also prompts us to continually review our approach. We closely monitor regulatory developments such as the planned EU directive on human rights due diligence.

Roles and responsibilities

Our Executive Board has ultimate responsibility for human rights within our sphere of influence. The Executive Board exercises this responsibility by requiring our **Managing Directors** to comply with human rights.

Our Human Rights Officer from the Group function Corporate Sustainability, Quality and Trade Compliance (SQ) is responsible for monitoring due diligence obligations concerning human rights and environmental matters. The Executive Board is informed at least once a year of the work of the Human Rights Officer and the implementation status of risk management and of the due diligence processes.

Those responsible for the issue in the Group functions, business sectors and local units are tasked with implementing our human rights due diligence processes in operations by integrating human rights due diligence into existing processes, for instance.

The cross-sectoral human rights working group exchanges information on activities and the latest developments in the areas of business and human rights. In 2023, two meetings were held.

Within the **UN Global Compact Network Germany**, we are a member of the **Business & Human Rights Peer Learning Group**. In this context, we discuss challenges, current issues, experiences, and successful approaches in exercising human rights due diligence with other companies.

Our commitment: Guiding principles, charters and laws

Our **Human Rights Charter** aligns with the **UN Guiding Principles for Business and Human Rights**. It is our overarching human rights directive and defines the relevant requirements for our company. These requirements cover a broad range of topics related to human rights, including, for instance, product safety, clinical studies, occupational health and safety, equal opportunity, fair pay, freedom of association and collective bargaining as well as the exclusion of child and forced labor. The charter interlinks and complements our existing rules and regulations pertaining to human rights. These include, for instance, our

- **Code of Conduct**
- Human Rights Due Diligence standard
- **Social and Labor Standards Policy**,
- **EHS Policy** (Corporate Environment, Health and Safety Policy),
- **Supplier Code of Conduct**,
- **Responsible Minerals Sourcing Charter** and
- **Charter on Access to Health in Developing Countries**.

We expect our employees as well as our suppliers and all companies with which we have business ties to comply with this charter.

In 2023, our Executive Board approved our Group Policy Statement on Compliance with Human Rights and Environmental Due Diligence Obligations in accordance with the German Supply Chain Due Diligence Act. It applies to our own business operations, in other words to our entire workforces, as well as to our suppliers. The

statement describes how we undertake to comply with our human rights and environmental due diligence obligations and provides information on the risks identified.

Identifying actual and potential impacts on human rights

We perform **risk assessments** to understand the potential impacts our operations and business relationships could have on human rights. For instance, we investigate human rights risks at our sites as well as risks related to product and service sourcing. These risk assessments enable us to derive the corresponding strategies and measures. We track human rights risks through our strategic supplier risk process. More information on how we engage with suppliers can be found under **Sustainable Supply Chain Management**.

We also strive to meet our human rights due diligence obligations when **deploying new technologies**. Our **Code of Digital Ethics** defines digital ethics principles and forms the basis for the work of the Digital Ethics Advisory Panel. More information can be found under **Digital Ethics**.

Measures to protect human rights

Risk analyses to determine human rights and environmental risks

We conduct special analyses to identify human rights and certain environmental risks. This enables us to identify potential risks, weight them appropriately and prioritize them. These risk analyses are carried out annually and on an ad hoc basis for our own business operations.

Our **Social and Labor Standards Policy** defines the corresponding commitments and principles as they relate to specific topics and sites. We regularly check compliance with the requirements using a risk-based approach. Among other things, this takes into account risks that may arise if relevant laws and regulations change or if there are violations of internationally recognized labor rights by governments and companies, as assessed by the **International Trade Union Confederation** and documented in the annual ITUC Global Rights Index. If we identify a violation during the audit, we define remedial actions together with the responsible Managing Director and/or local HR staff.

We also assess human rights aspects at our sites through security audits and as part of the risk analysis. The audits are one control mechanism of our security governance framework. Through increased risk transparency and central follow-up of corrective and preventive actions (CAPA) we help ensure that our sites comply with **safety-related human rights aspects**. Through the **Together for Sustainability** (TfS) initiative, we determine whether our strategically important suppliers comply with human rights standards.

Human rights and investment decisions

When projects exceed a certain cost threshold, our Investment Committee must approve the expenditure. In its decision, the committee considers various aspects related to the project, including environmental impact and health and safety. Furthermore, our Code of Conduct is binding where investment decisions are concerned. We also integrate human rights topics into our decision-making processes regarding mergers and acquisitions.

Creating awareness among our employees

An **online course** trains our Managing Directors and senior management in how to meet the requirements of our Social and Labor Standards Policy in their area of responsibility.

We are constantly expanding our internal communication to better enshrine our commitment to human rights across the Group. In doing so, we are raising awareness of human rights and modern slavery. Through our global sustainability network, for example, we held a webinar on human rights in the corporate context in 2022. In addition, **virtual information events** on the **implementation of the German Supply Chain Due Diligence Act** were offered to selected target groups.

Training courses for our suppliers

In collaboration with Together for Sustainability (TfS), we offer our employees training modules from the TfS Academy. Through the platform, employees of TfS member companies and their suppliers can access a total of 181 courses in up to nine languages. The module on human rights due diligence, for instance, covers the topics of child labor, forced labor, human trafficking, discrimination, and harassment. We also participated in the #TfSTalks, an interactive webinar series.

Our reporting practices

We inform the public about our approaches and measures as well as the results of our human rights due diligence. We provide information on this annually in our Sustainability Report. Under laws in Australia, the United Kingdom and Norway, we are additionally required to publish information in these countries on our measures to combat forced labor and human trafficking. Apart from the **UK Modern Slavery Statement** and the **Merck Australia Modern Slavery Statement**, we also published the **Norway Transparency Statement** for the first time in 2023.

Our complaint mechanisms

We have set up a Group-wide whistleblowing and complaints system that can be used to report potential violations of human rights, legal provisions and environmental issues, among other things. Our compliance hotline is a central element of this. Our employees as well as external stakeholders can report suspected cases via this Group-wide whistleblowing system in their respective national language, free of charge and anonymously, either by telephone or a web-based application. We are committed to thoroughly investigate all complaints that we receive and take countermeasures if necessary. More information on the compliance hotline can be found under **Compliance Management**.

In addition, we published **Rules of Procedure**. These apply to tips or complaints that refer to human rights and certain environmental risks or violations at our company and along the supply chain in line with the German Supply Chain Due Diligence Act. In the reporting year, 184 violations of the Social and Labor Standards Policy were reported to us in our own business operations, 60 of which were confirmed. Furthermore, based on the complaint channels specified in the Rules of Procedure, there were **no indications** of child or forced labor or violations of the right to collective bargaining or freedom of association in our own business operations or in the supply chain in 2023.

Clinical studies

Before obtaining regulatory approval for our medicines, we conduct clinical studies with patients and, if necessary, also with healthy volunteers to investigate the safety and effectiveness of our products. We also perform extensive preclinical research, including animal testing, to demonstrate that our treatments pose no unacceptable risks to humans.

Our approach to safe and transparent clinical studies

Our aim is to conduct high-caliber clinical research that is in compliance with applicable laws and regulations. We set Group-wide requirements that aim to ensure that **high ethical and scientific standards** are met when conducting clinical trials.

We only conduct clinical studies to investigate issues relevant to patients, healthcare professionals or society, and only when our established methodology finds the given medicines show significant therapeutic promise and a **positive benefit-risk ratio**. Accordingly, to ensure patient safety and avoid interrupting the development of promising products, we carefully select patients based on known risk factors. These include age and comorbidities, which we reflect in the design of our clinical studies. Notably, we only enroll the specific number of patients needed to answer the posed scientific and medical questions. We reconcile and review the safety reports from our clinical studies and marketed products and immediately address any unforeseen risks. Senior boards such as the Pharmacovigilance Advisory Board and the Medical Safety and Ethics Board maintain oversight of any emerging safety concerns. In addition, cross-functional Benefit Risk Assessment teams adapt the benefit-risk assessment and development strategy of each product to ensure it delivers maximum safety and efficacy to our patients. In addition, a sound, established scientific methodology must be available to investigate these scientific or medical questions.

Protecting the safety, well-being, dignity, and rights of the patients and healthy volunteers participating in our clinical studies is of utmost importance to us. We do not intentionally expose study participants to undue risk or irreversible harm. **Data privacy** is also very important to us, and we maintain a strong focus on data protection and confidentiality in compliance with statutory regulations.

Diversity, equity and inclusion in clinical trials

Based on our **Standard on Human Research,** we aim to conduct clinical studies that adequately represent the diverse patient populations expected to use our products once they are approved. To ensure fair, balanced and scientifically justified study representation, we cemented our commitment to Diversity, Equity and Inclusion (DE&I) in clinical trials by collaborating with healthcare providers and community advocates to eliminate common barriers to clinical trial participation. We have also reviewed our internal processes to enable more inclusive research practices. Additionally, to publicly disclose our views on DE&I, including in clinical trials, we published our very first DE&I report in 2023. It reinforces our commitment to ensuring study participants face no discrimination due to factors such as their gender, ethnic origin, religion, disability, gender identity, or socio-economic status.

Our ongoing efforts to increase diversity in our clinical studies have been formally recognized by **Bioethics International**. In 2023, we received a gold badge and ranked equal first among seven of the 25 rated pharmaceutical companies. The rating considered important factors in oncology studies, including the fair and equitable representation of diverse patient populations.

Patient-focused drug development

We are improving our approach to research and development by committing to patient-focused drug development that more actively involves patients, caregivers, and their advocates in our work. Their **valuable insights into disease and treatment management** will help us make more informed decisions at each stage of the medicine development process. We aim to make our studies easy for patients to understand while ensuring all participants have positive experiences as they contribute to our understanding of the particular disease and its treatment. At every level of our organization and based on the function, we are additionally either offering or mandating to educate staff about the value of a close, more consistent patient interaction and the requirements to protect our patients' independence and privacy.

Clinical studies in low- and middle-income countries

We conduct our clinical studies in accordance with local laws and regulations, and we aim at adhering to the **relevant international scientific and ethical standards**, irrespective of the region or country. We are deliberately expanding our medicinal product development to more diverse markets to address pressing healthcare needs in low- and middle-income countries and support the development of their healthcare systems.

When performing clinical studies in low- and middle-income countries where there is usually a lower level of healthcare and limited healthcare infrastructure, the following directives also apply:

- We only do so in an environment where the principles of Good Clinical Practice can be upheld.
- We only investigate diseases and innovative products that are relevant to the local population.
- We only conduct clinical studies in countries where we expect that the product being tested will be submitted for marketing authorization and made available to patients after we have proven its efficacy and safety.

Roles and responsibilities

Clinical development, including clinical studies and their related governance processes, are the responsibility of our Global Development unit. The Head of Global Research & Development reports to the CEO Healthcare, who is a member of the Executive Board.

We review the progress of new product development at defined milestones and make decisions about the continuation, modification or discontinuation of development, depending on the results of clinical studies.

We have established two internal committees to oversee our clinical studies. The Integrated Protocol Review Committee is responsible for the studies performed by the company on products that are under clinical development, while the Global Medical Decision Board is responsible for our own studies with approved products as well as for all studies performed by independent investigators and supported by us (so-called investigator-sponsored studies). Both bodies consist of medical-scientific **experts and executives with long-standing experience** in clinical research. Our development and study teams present clinical study concepts to the appropriate committee. The committees meet regularly or as needed to conduct a comprehensive review of the proposed concepts and ascertain that our studies are scientifically sound, have a legitimate scientific purpose and are performed in accordance with the latest standards and best practices.

Before administering a new product to humans, there must be sufficient evidence that it offers a potential **therapeutic benefit**, is sufficiently safe for use in humans and has a positive benefit-risk ratio. We only take the critical step of a first-in-human clinical trial after diligently conducting extensive preclinical testing. The decision lies with a separate committee, the Human Exposure Group, chaired by our Global Chief Medical Officer.

We continuously analyze potential **risks for study participants** before and during our clinical studies. Our Medical Safety and Ethics Board (MSEB) oversees the safety of the participants in our clinical studies and, as necessary, reviews the benefit-risk profiles of **investigational products**. Further information on the MSEB can be found under **Patient safety**.

Emerging issues related to a clinical study may be submitted to the relevant committees by product teams or other committees, as defined in relevant standard operating procedures or committee charters. Also, if individual employees wish to seek advice or report concerns on ethical questions, they can contact the members of a committee directly.

Our commitment: International guidelines and requirements

Our Quality Policy defines the strategic framework that ensures our products, services and systems deliver high quality, safety and efficacy to our patients. It details the most relevant laws and codes, criteria and guidance (e.g. for product development and manufacturing), and our senior management's responsibility to ensure quality is embedded in everything we do.

Our Standard on Human Research provides the framework for conducting clinical studies and helps ensure we adhere to all applicable **legal, ethical and scientific standards**. Further quality documents detail for instance the strategic direction of all quality related activities or disclose our position on data privacy. In addition to the relevant national laws and regulations, these documents also include:

- The **Good Clinical Practice** (GCP) guidelines of the International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (**ICH**)
- **The Declaration of Helsinki**, published by the World Medical Association
- Good Pharmacovigilance/Laboratory/Manufacturing/Distribution Practices (GVP/GLP/GMP/GDP)
- The **International Ethical Guidelines for Health-related Research Involving Humans**, published by the Council for International Organizations of Medical Sciences (**CIOMS**)
- The **Joint Position on the Disclosure of Clinical Trial Information via Clinical Trial Registries and Databases** and the **Joint Position on the Publication of Clinical Trial Results in the Scientific Literature**, published by the International Federation of Pharmaceutical Manufacturers & Associations (**IFPMA**), the European Federation of Pharmaceutical Industries and Associations (**EFPIA**), and the Pharmaceutical Research and Manufacturers of America (**PhRMA**)
- The **Principles for Responsible Clinical Trial Data Sharing**, published by EFPIA and PhRMA, and the IFPMA Principles for Responsible Clinical Trial Data Sharing.

Regular supervision of clinical studies

Our clinical study processes and procedures are regularly inspected by relevant regulatory authorities to verify their compliance with applicable laws and guidelines.

The Research & Development Quality and Risk Management (RDQRM) unit applies a risk-based identification strategy to determine areas that need to be audited. **Quality assurance audits** are performed internally within Healthcare R&D (for example, process audits) and externally (e.g., investigator sites and vendor audits). We respond immediately to observations made during audits by investigating their root causes and, according to their criticality, defining and implementing corrective and preventive actions to improve processes, prevent reoccurrence of irregularities and ensure compliance. As planned, in 2023, RDQRM concluded most of the audits of the Annual Audit Plan.

Conducting clinical studies responsibly

Prior to enrolling participants, every clinical trial must first be assessed and approved by a qualified **independent ethics committee**. Additionally, all regulatory authorizations required in the respective country must be obtained. In accordance with Good Clinical Practice guidelines (ICH-GCP), all study participants must give their explicit informed consent before enrolling in a clinical study. Participants are fully informed about all aspects of the clinical study in a language that they understand. This includes the potential risks and benefits from participating in the study and the opportunity to inquire about details. As far as possible, non-interventional (observational) studies are also assessed by an ethics committee.

Every clinical study follows defined procedures to ensure it is conducted to **high quality standards** in line with good working practices (GxP) for the development and manufacturing of drugs, the ethical principles of the **Declaration of Helsinki** and other international guidelines and regulations. As in the previous year, in 2023, none of the regulatory inspections conducted on our clinical research activities resulted in regulatory action.

We continuously collect and communicate **safety data on our investigational products** and promptly provide clinical investigators with important new findings relevant to the safety of study participants. In this way, we help to ensure the safe use of our products. Potential adverse effects and risks are taken into consideration to evaluate the benefit-risk ratio of our products and manage any risk. Product information, including the investigator's brochure and information for study participants, is updated accordingly. More information is available under **Patient safety**.

Conducting clinical trials in vulnerable populations

The implementation of clinical studies in vulnerable populations, such as children or people with disabilities, requires **special attention and care** to comply with the highest ethical and scientific standards. The well-being of the individual is our highest priority. For this reason, we only conduct studies with participants from vulnerable population groups if scientifically justified and if there is no other way to achieve conclusive results. When performing such studies, especially when informing study participants and obtaining their consent, we take statutory regulations into account.

Teaming up to get results

The clinical study investigators participating in our clinical studies by enrolling and caring for patients are critical to the successful development of new products. Furthermore, to achieve a broad, in-depth basis for the development of new treatments, we seek advice from medical-scientific advisory boards and frequently conduct clinical studies in collaboration with external **partners in academia and industry**. We also rely on the support of contract research organizations (CROs) and other service providers and vendors. We expect from our partners that they apply the same high standards in terms of ethical conduct and quality in clinical research.

As a member of **TransCelerate**, a consortium of 22 pharmaceutical companies, we are currently collaborating on several initiatives to identify, prioritize, design and facilitate implementation of solutions designed to drive the efficient, effective and high-quality delivery of new medicines.

Close dialogue with patients and advocacy groups

We want to ensure that the voices and **needs of patients and their caregivers** are adequately heard and taken into consideration throughout the entire lifecycle of our products. We have a strong internal policy as well as compliance guidance documents, which provide clarity on how to ensure that such engagements take place within an ethical framework. In addition, we established the Patient Advisory Boards (PAB) as one of our crucial communication channels. Our PAB guidance document describes how to involve patients and caregivers in our clinical research process. During Advisory Board meetings, patients, caregivers and representatives from patient advocacy groups are invited to share their experiences related to clinical studies. We use this opportunity to discuss multiple aspects of the product development process, including but not limited to protocol design, educational materials, technology and innovative approaches to clinical studies.

Furthermore, we are involved in multiple activities that focus on this relevant aspect of **patient centricity in clinical studies**. For example, in the United States, we are an active member of the Clinical Trials Transformation Initiative (**CTTI**), which focuses on quality and efficiency in clinical trials. For instance, in 2023 we engaged with the CTTI to develop industry recommendations for increasing diversity in clinical trials, as mentioned above.

Responsible data sharing

We support professional circles in advancing **medical and scientific knowledge**, thereby enabling informed healthcare decisions for the benefit of patients. Upon request, we provide qualified researchers with study protocols, anonymized individual patient data, study data, and clinical study reports. We share data and information in a manner that is consistent with the joint **Principles for Responsible Clinical Trial Data Sharing** of the **EFPIA** and **PhRMA**:

- Safeguarding the privacy of patients
- Respecting the integrity of national regulatory systems
- Maintaining incentives for investment in biomedical research

Disclosure of clinical studies and publication of results

We are obligated to disclose findings from our clinical studies. We strive to do this publicly in a complete, accurate, balanced, transparent, and timely manner as laid out in our Standard on Clinical Trial Data Transparency. Our clinical study designs and results are made public in the international **ClinicalTrials.gov** database run by the U.S. National Institutes of Health (**NIH**), which can also be accessed via the World Health Organization's International Clinical Trials Registry Platform (**ICTRP**). Furthermore, in accordance with EU regulations, we publish results from our clinical studies in the EU Drug Regulating Authorities Clinical Trials (**EudraCT**) database, which is run by the European Medicines Agency (**EMA**). Additionally, new applications for clinical studies in scope of the EU Clinical Trials Regulation were submitted through the **Clinical Trials Information System** (CTIS) and will be published on the public **CTIS portal**. We will transition all ongoing studies to CTIS by January 2025. If required by local laws and regulations, we publish study results on other publicly accessible platforms. We provide clinical study report synopses and summaries of study results in plain language on our **clinical trials website**.

We publish results from our clinical studies in **medical journals** in line with applicable laws and industry codes. In particular, we adhere to the current version of the Good Publication Practice (**GPP3**) and align with the recommendations of the International Committee of Medical Journal Editors (**ICMJE**). Our Medical Publications Policy helps us to consider relevant standards and use defined standard procedures for scientific publications on our Healthcare's products. In addition, we reference our clinical study publications on our **website**. Our **Standard on Clinical Trial Data Transparency** underscores our strong commitment in this area.

Enabling early access to new medicines

Not all patients have the opportunity to take part in a clinical study and must therefore wait for a new pharmaceutical product to be approved. Through our **Early Access Program**, we can, under specific circumstances, enable patients to gain early access to new, potentially life-saving products. The offer is aimed at people with serious conditions who have already received all available therapies without success. It allows them to be treated with products that have already been clinically tested but have not yet been approved. Furthermore, we offer patients who participated in one of our clinical studies post-study access to the investigational product, provided that certain conditions are met. Here, too, we meet stringent statutory, ethical and scientific standards. By performing a thorough assessment of all available data, we ensure that the potential benefits outweigh the potential risks for patients. **Position papers** on **early access** and **post-study access** are available on our website.

Supporting independent human subject research

In addition to conducting our own clinical research programs and studies, we also support studies proposed by independent investigators, so-called investigator-sponsored studies (ISS). Our **ISS Principle** defines ISS as unsolicited request for funding and/or supply of an investigational or marketed product by independent investigator/institution that initiates and conducts a scientific investigation as the regulatory sponsor. By granting **financial or material support** for independent human subject research, we seek to stimulate the advancement of clinical and medical knowledge and patient care in our therapeutic areas of interest and support the safe and effective use of our products. We give priority to research that is innovative and has the potential to address specific unmet medical or scientific needs. Our principles, framework and standards for granting support for ISS and our collaboration with independent investigators are specified in our ISS Principle, which is available on our **website** and in our corresponding policy and standard operating procedure.

Animal welfare

International and national legislation mandate animal testing of medicinal compounds and chemicals during their development and prior to their approval for commercial use. In addition, from an ethical and scientific perspective, animal research is indispensable based on the current state of knowledge. We perform animal-using activities in all three of our business sectors.

Our approach to animal welfare

Our long-term aspiration is to entirely dispense with work involving the use of animals and to replace it with better, cutting-edge alternatives. We aim to outperform as a leader in non-animal-derived products and testing in the life science and pharmaceutical industries. Our business sectors develop individual strategic roadmaps, priorities and timelines towards this aspiration.

Animal testing will be an unavoidable necessity for many more years, especially in drug development, to ensure the safety and efficacy of certain medical products, medicines and vaccines. As long as animal usage cannot be completely avoided, we are committed to applying the **highest ethical and animal welfare standards** related to the housing, husbandry and veterinary care of all animals involved in our work. Our definition of "highest possible standards" goes beyond the legal requirements and is specified in our internal quality documents. For example EU Directive 2010/63 on cage and kennel sizes is also applied in the United States. In addition, the ILAR Guide also applies to mice and rats. Moreover, we are aiming to ensure comprehensive **transparency** as well as ongoing assessment, monitoring, auditing, and improvement of all work involving the use of animals by our company and by trusted third parties. We aim to continuously optimize our animal testing processes, striving to enhance the animals' quality of life. We use as few animals as possible and replace their use with alternative methods wherever feasible. In addition, we advocate for the global acceptance of replacement methods. To this end, we collaborate with other companies and scientific institutions.

We subscribe to the internationally recognized **3Rs for animal-based research** and have added Responsibility as our fourth animal welfare principle in line with the ethical considerations published in 2019 by David DeGrazia and Tom Beauchamp in **Principles of Animal Research Ethics**:

- **Replacement** – replacing animal studies with non-animal systems
- **Reduction** – using the minimum number of animals required
- **Refinement** – minimizing distress or discomfort before, during and after testing
- **Responsibility** – accepting responsibility for all animals in our reach internally and among our business partners

Within our **Life Science** business sector, animal activities include required regulatory safety testing of our own products and on behalf of customers. The Life Science product portfolio also includes various materials needed for research that are derived from animals or by-products from food production, such as blood, plasma, serum, or items specifically produced in animals such as antibodies. Our **Healthcare** business sector conducts animal testing as mandatory part of the drug and medical devices development process and conducts biological quality control in animals. Our **Electronics** business sector conducts animal tests as required by applicable chemical regulations. According to the EU Cosmetics Regulation, no animal tests are allowed for cosmetic ingredients.

Roles and responsibilities

Our Corporate Animal Affairs unit governs the implementation of the Corporate Animal Welfare strategy. The unit acts globally and locally, setting and overseeing guardrails for the use of laboratory animals based on four pillars:

- Animal Welfare
- Animal-Using Vendor Management
- Merck Vivarium Oversight
- The 4R principle

The **Group Animal Welfare Council**, sponsored by the CEO of our company, comprises representatives from all business sectors and usually meets three times per year under the leadership of Corporate Animal Affairs and may meet more often if required. The council acts as a sounding and advisory board, assessing which of our services and product innovations can help to avoid animal testing in the future. Moreover, it consults on business-critical issues, adopts key indicators and serves as an escalation body.

In Europe, the Merck Animal Usage Review (MAUR) board reviews and approves all internal animal work planned for our vivaria. In the United States and Israel, these tasks are performed by comparable company boards such as the Institutional Animal Care and Use Committees (IACUC, in accordance with the **U.S. ILAR Guide**). In addition, a global MAUR/IACUC board reviews and approves all animal-based activities at all our vendors, contract research organizations and academic partners. We use digital systems for both processes, namely internal review by MAUR or IACUCs as well as externally commissioned studies. Those responsible for internal animal testing or those who commission external activities involving animals enter information relevant to an audit of our animal welfare standards. The data records entered enable transparency and allow us to reliably collect and monitor our key figures.

Global and local official representatives and **animal welfare officers** who are independent of the business report directly to Corporate Animal Affairs and see themselves as advocates of the animals. Their tasks entail animal science and welfare management as well as acknowledging the individual skills and abilities of all personnel working with animals. Furthermore, they regularly inspect the animal facilities as well as review and approve protocols.

The **Animal Using Vendor Management** unit plans the review and carries out the qualification of our suppliers and business partners with regard to aspects relevant to laboratory animal science and animal welfare. It uses a digital system with an integrated approval process that also allows the monitoring of suppliers, universities, contract research institutes, and business partners. This system is an important part of our efforts to collaborate exclusively with qualified external institutions.

If employees identify an animal welfare problem, they can use various routes to report it either directly to Corporate Animal Affairs, to local and global animal welfare officers or via our compliance hotline.

The **4R team** and cross-functional workstreams develop and guide projects to implement our 4R principles. The 4R team regularly reports progress made with the 4Rs to the **Group Animal Welfare Council**. It also coordinates the 4R Award, with which we recognize contributions to the Replacement, Reduction, Refinement of, and Responsibility for our animal work.

Comprehensive employee training

Through our new Animal Affairs Academy, we offer a holistic training program for the entire company. We conduct courses on animal welfare and animal testing, and we supervise and support training for the workforce on practical work as well as on the applicable rules and regulations. Employees involved in animal activities receive appropriate training and continuing education. Initiated in 2022, our Vivarium Rotation Program enables individual employees from each of our vivaria to visit another vivarium every year to exchange knowledge and share best practices. To promote ongoing dialogue outside the program as well, the Vivarium Rotation Program community was formed; it meets once per quarter.

Additionally, our employees regularly participate in external **continuing education programs**.

Work with committees and associations

We are involved in several organizations and initiatives, including as Vice Chair in the Research and Animal Welfare Group (RAW) of the European Federation of Pharmaceutical Industries and Associations (**EFPIA**) and as well at **Interpharma**, a federation of research-based pharmaceutical companies in Switzerland. Interpharma conducts audits at contract research organizations and animal breeders together with selected member companies.

We are also involved with the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC). This private, nonprofit organization promotes the humane treatment of animals in science through voluntary accreditation and assessment programs. In 2023, one of our own employees served as Immediate Past Chair of the AAALAC International Board of Directors. We continue to support the European Partnership for Alternative Approaches to Animal Testing (**EPAA**) and participate in its working groups developing alternatives to animal testing. In 2023, we were appointed Chair of the Leadership Coalition of the Marseille Declaration for 2024. Moreover, we participated in the Germany REACH Roundtable – Industry, established and led by the Humane Society International, the objective of which is to reduce the number of animals used in chemicals testing.

Our commitment: Group-wide standards

We consider compliance with statutory **animal welfare requirements** to be a matter of course. However, the standards that we define in our **Animal Affairs Policy** go beyond this and are based on species-specific basic needs. We have defined our set of rules based on these and strictly monitor compliance with them. This also applies to tests carried out for us by third parties.

Our standards and procedures entail, for example, the housing and husbandry standards that also apply to external partners, and how we monitor them, for instance through audits. The Animal Using Vendor Management standard governs the qualification process when working with contract research organizations and suppliers. The Global Blood Sampling Standard (GBSS) sets parameters and methods for drawing blood samples as well as maximum blood sampling frequencies and quantities within a defined time period. Further documents, for instance guidance on our 4R efforts, incident reporting and risk management, augment the governance framework.

In 2022, we initiated the Marseille Declaration in order to advance the global implementation of high animal protection standards. This is voluntary commitment by companies with commercial animal husbandry activities and extends beyond local legislation. Further companies became signatories in 2023.

We are convinced that the right level of **transparency** can lead to better scientific outcomes, increase the value created by animal testing and significantly improve animal health and welfare. In addition, it can create benefits

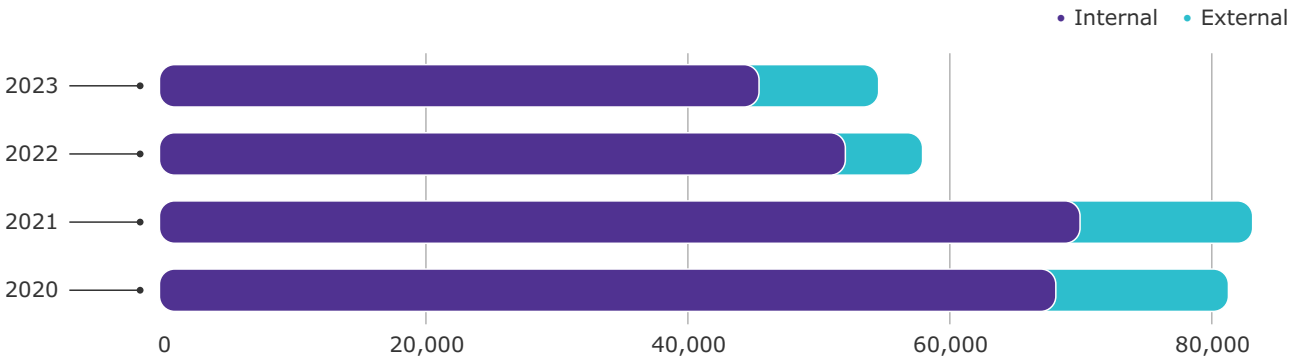
for society, patients and animal well-being. We therefore conducted several activities in 2023 in line with the commitments of the Transparency Initiative Germany, of which we are a signatory. Noteworthy examples include the presentation by our Chief Veterinary Officer at the 12th World Congress on Alternatives to Animal Testing in the Life Sciences and the interview by our Executive Board in the Frankfurter Allgemeine Zeitung on the abolition of animal testing.

Number of laboratory animals used for medical study purposes

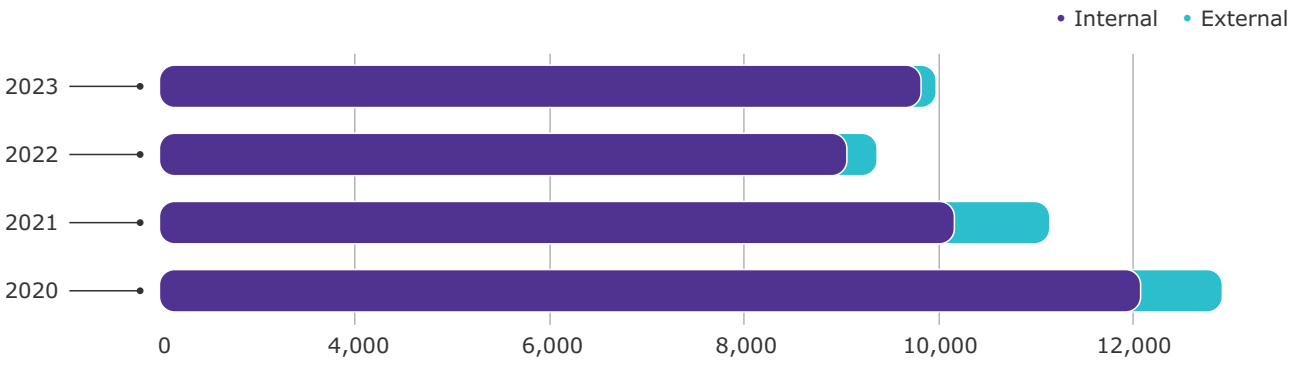
We want to increase transparency regarding the laboratory animals we use by reporting both the number of laboratory animals used by the entire company as well as the numbers used by the Life Science and Healthcare business sectors separately. In Life Science, as well as the absolute number of laboratory animals, we also show the number in relation to sales because in this business sector, we perform animal-using activities on behalf of customers. In the pharmaceutical industry, it is stipulated by legislation that animal testing must be carried out to determine the efficacy and adverse effects of medicines.

In addition to the absolute number of laboratory animals, we show this for Life Science in relation to sales, as in this business area we carry out activities in animals on behalf of customers, as there is a direct correlation between profits and animal numbers. In the pharmaceutical sector, on the other hand, animal experiments are primarily carried out in preclinical research to test the efficacy and safety of drugs that are still in development. Accordingly, the number of animals is not directly related to the sales generated by approved drugs.

Number of laboratory animals in Healthcare and Electronics



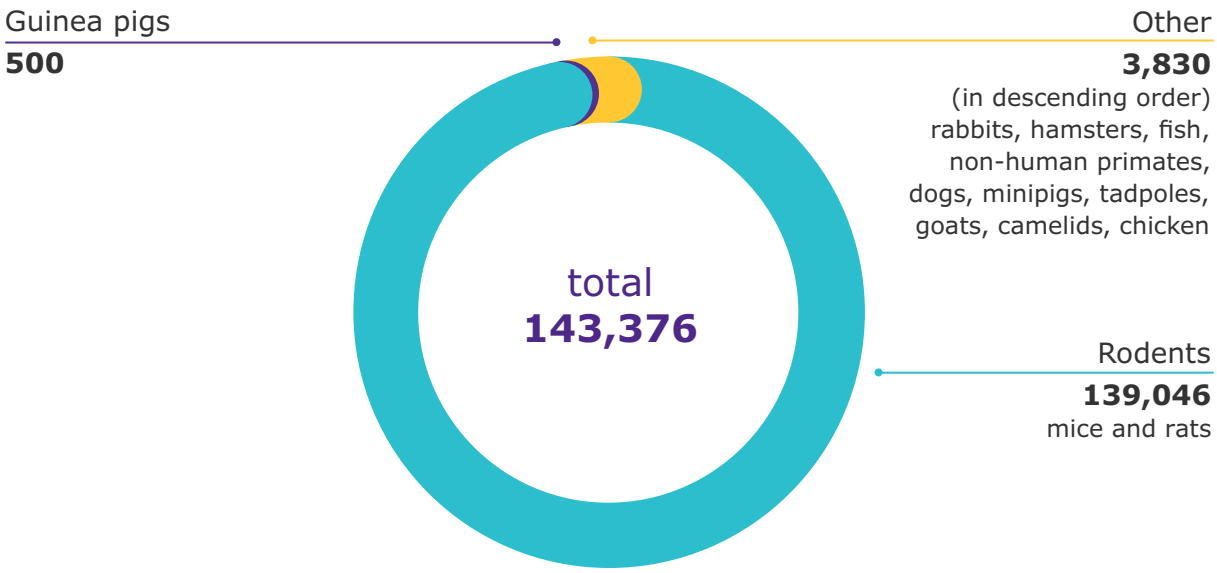
Number of laboratory animals in Life Science relative to sales



In 2023, we used a total of 143,376 animals for animal testing within the meaning of Directive 2010/63/EU. Of this total, we used 132,522 animals in our own vivaria; organizations contracted on our behalf as well as academic partners used 10,824 animals. In our Life Science business sector, 87,144 animals were used in our own vivaria; 1,703 animals were used by organizations contracted by our customers and for production. For our Healthcare business sector, we used 45,408 animals in our own vivaria and 7,577 animals were used by contract organizations and academic partners. Of this total, Healthcare used 1,544 animals to test chemical safety on behalf of our Electronics business sector.

Regulatory agencies sometimes require studies of the safety of investigational drugs in nonrodent species. This allows researchers to identify potential adverse effects accurately and include them in the risk assessment of a substance.

Animal types



Collaborating with partners and suppliers

We perform the majority (92%) of animal testing in our own animal husbandry facilities. We source our laboratory animals from specialized animal breeding operations. We also commission contract research organizations to conduct animal studies on our behalf. Furthermore, we work with academic institutions. Whenever collaborating with such organizations, we require them to abide by our standards.

Conducting animal welfare audits

Corporate Animal Affairs conducts an audit of each of our vivaria every three years. In 2023, two vivaria were audited, namely in Billerica, Massachusetts (USA) and in Darmstadt, Germany. Additionally, we further **improved Corporate Animal Affairs' oversight** of internal animal work regarding aspects such as animal usage, purpose and incident reporting.

An integral part of our strategy is the qualification of all vendors who conduct work with animals on our behalf. Quality assurance of these qualifications is based on our established and robust audit process well as on an existing process to select and train our auditors. In 2023, a total of 37 vendor audits were performed, 33 of them on-site, and 4 virtually.

4R Day in 2023

We want to firmly embed the 4R principle in our company and to motivate our employees to contribute to it. To this end, we hold an annual 4R Day and with our biannual 4R Award worth € 10,000, we recognize best practices in animal-using activities, such as innovative alternatives to **reduce, refine and replace** animal testing. In addition, we honor exemplary behavior that demonstrates how we meet our **responsibility for animal well-being**. The next 4R Award will be granted in 2024.

The theme of our 4R Day in 2023 was "Compassion Fatigue and Culture of Care". This dealt on the one hand with the symptoms of fatigue that can arise when working with animals and on the other hand about fostering a culture of appreciation towards living beings. Both internal and external experts held presentations on these topics.

Bioethics

Scientific advances can spark controversial debates over ethical questions. We want to make responsible use of the growing potential of the life sciences to maximize benefit for both humankind and other living beings. In this context, it is important to us that we adopt our own position on bioethical questions.

Our approach to ethical business conduct

As a science and technology company with a broad spectrum of research activities, it is critically important for us to identify and address emerging bioethical topics and questions early on so that we can define our own position. Although we align all our operations with international and national laws, many technological developments raise new ethical questions that extend far beyond the framework set forth by current legislation. Our goal is to conduct research in a responsible manner, which is why we develop ethical guidelines – also in close collaboration with external experts – in order to make well-founded decisions for responsible research.

In our work, we encounter various topics of ethical relevance such as animal testing, clinical research, stem cell use, the use of genetically modified microorganisms, and the potential impact of new genome editing techniques such as CRISPR/Cas. Moreover, we discuss in our committees the ethical aspects of providing products such as organoids for both academic research purposes and the biopharmaceutical industry.

We carefully evaluate our position when it comes to controversial topics. We always prioritize the well-being of and benefit for various groups of patients, whether in clinical studies or during treatment with our medicines.

Roles and responsibilities

Since 2010, the Merck Ethics Advisory Panel for Science and Technology (MEAP) has been making clear recommendations on ethical questions in science and technology as well as on questions extending beyond the field of traditional bioethics, in line with our transformation into a science and technology company. The recommendations of the MEAP guide our actions and business activities.

The members of the MEAP are renowned international experts from the fields of **bioethics, medicine, philosophy, law, and the natural sciences** as well as **technology** and **sustainability**. The MEAP has its mandate from the Executive Board and is chaired jointly by the two members of the Executive Board with responsibility for the Healthcare and Life Science business sectors.

The MEAP meets multiple times a year and can also be convened on an ad-hoc basis in response to emerging urgent ethical questions. The meeting minutes can be accessed on our intranet, along with the recommendations given by the MEAP. Our employees can submit topics for the MEAP to the Bioethics team. If necessary, we involve further external experts. In addition, all employees may address their concerns to the Bioethics team via our **compliance hotline** and a dedicated e-mail address (accessible via the intranet).

A further board, the Stem Cell Oversight Committee (SCROC), reviews and decides on all planned in-house research activities involving the use of human embryonal or pluripotent stem cells, ensuring compliance with legal requirements as well as our ethical guidelines. This also applies to joint projects with external partners. Up until the end of 2022, the SCROC consisted of internal experts from our business sectors as well as external advisors from the fields of bioethics, medicine, and law. In 2023 and in line with a resolution by the MEAP, we transformed the SCROC into a primarily internal board. The reason for this is that research plans that call for

separate committee approval pursuant to the SCROC charter are currently not being carried out within the company. However, we will continue to involve external experts in the decision-making process should especially complex issues call for this.

Furthermore, for ethical questions arising for instance in the context of forward-looking business decisions, targeted Ethics Foresight projects can be initiated. We specifically engage external experts to work on these projects. In contrast to the MEAP, no specific recommendations result from Ethics Foresight projects, but the respective ethical risk for various scenarios is determined and several decision paths are mapped instead. In addition, the projects map potential consequences of various decisions. No Ethics Foresight projects were commissioned in 2023.

Our commitment: Guidelines and standards

Our **Genome Editing Principle** provides a binding ethical and operational framework for our employees. Apart from our position on genome editing, it includes information on human germline editing. It sets clear boundaries for us both as a supplier of customized CRISPR/Cas nucleases and genetically modified cell lines and as a company that uses genome editing technologies in our research.

This is complemented by further guidelines that form the ethical framework of our research and business activities. Our **Stem Cell Principle** sets the ethical boundaries for the use of human stem cells in our research. Our **Fertility Principle** regulates our fertility treatment and in-vitro fertilization research activities.

Biological samples are indispensable to the development of new targeted treatments and advanced diagnostic methods. We have defined our principles and processes for managing human biospecimens in standard operating procedures. Accordingly, we handle these samples in a responsible and ethical manner; in doing so, we adhere to relevant regulatory requirements and abide by the consent given to us by donors for the use of their samples.

Topics currently being discussed by the MEAP

In 2023, the MEAP met in May and October and discussed ethical questions of organoids, among other things. These are organ-like microstructures that can be produced artificially in the laboratory, for example from induced pluripotent stem cells.

The use of organoids is increasingly opening up the possibility of partially replacing and fundamentally reducing animal testing. This is in line with our commitment to animal welfare (see **Animal welfare**). In addition, it is becoming apparent in research and practical application that organoids could offer scientific advantages over animal models – one of the reasons why the use of organoids is currently increasing rapidly. This growth raises urgent bioethical questions, for example with regard to cell donation. The MEAP recommended that future donors should be more fully informed about the use of their cells, including any commercial uses. We want to review and further develop the design of consent forms in this regard.

The MEAP also addressed the legal and ethical classification of human embryo-like models recently created for the first time, as documented in the scientific literature. This discussion placed particular emphasis on the context of the German Embryo Protection Act and its possible implications for our work.

The MEAP also recommended examining how ethical standards can best be upheld for global health issues. This concerns mass drug administration (MDA), where participants must be informed and informed consent obtained. One focus was on MDA projects that are carried out with local partners or international organizations; the aim is to implement such actions effectively within the agreed areas of responsibility.

MEAP members

Jeremy Sugarman
Bioethics, Medicine
Johns Hopkins University

Jochen Taupitz
Medical law, Bioethics
University Mannheim

Nikolaus Knoepffler
Philosophy, Theology, Ethics
University Jena

Rafaela Hillerbrand
Philosophy, Physics, Technic ethics
Karlsruher Institute for Technology

Maria-Elena Torres-Padilla
Epigenetics, Stem cells
Helmholtz Center Munich

Thomas Douglas
Medicine, Philosophy
Oxford Uehiro Centre for Practical Ethics

Ruipeng Lei
Bioethics, Philosophy
Huazhong University of Science and Technology

Maria de Jesús Medina-Arellano
Bioethics, Medical law
National Autonomous University of Mexico

Biotechnology and genetic engineering

Throughout the Group, we manufacture our biotech products in accordance with rigorous standards at all sites. All these activities are subject to strict statutory regulations worldwide and compliance with these regulations is monitored by our **biological safety officers**. We continuously track local regulatory changes that relate to biotech products and adapt our processes if necessary. This helps us to ensure that all legal requirements are known and complied with.

Using genome-editing techniques

We are a leading supplier of technologies such as CRISPR/Cas, which can be used to target and modify specific genes, a process known as **genome editing**. CRISPR/Cas opens up new possibilities in genetic engineering research that could bring about major advances in the treatment of serious diseases. Laws in different countries allow for a varying degree of latitude in applying this technique. Bioethical positions on germline editing have been evolving for years through academic and social discourse. Our position on human **germline** editing is as follows:

“In accordance with the German Embryo Protection Act, we do not support the use of genome editing in human embryos or clinical applications of germline interventions in humans. We recognize that there may be value in responsibly conducted related research.”

Stem cell research

We neither participate in clinical programs that utilize human embryonic stem cells or cloned **human cells** for the treatment of diseases, nor do we pursue such approaches ourselves. However, we use human embryonic stem cells in our research and offer our customers several select stem cell lines. In both applications, we allow the use of human embryonic stem cells only if clearly defined conditions have been met. For instance, we only utilize stem cells for research purposes if our SCROC has reviewed the respective project and given approval. In fiscal 2023, no projects required the approval of the SCROC (2022: one project). We exclusively make use of cell lines that have been approved by the United States National Institutes of Health (**NIH**) and are allowed under the German Embryo Protection Act as well as the German Stem Cell Law.

Digital ethics

People, machines, data, and processes are becoming increasingly interlinked with technological advances transforming our society and posing new ethical challenges. Our digital ethics activities define how we responsibly handle data and algorithms.

Our approach to corporate digital responsibility

As it is our aim is to develop and use **new digital technologies** responsibly, we evaluate ethical issues that may arise from algorithms, artificial intelligence (AI) and data-based business models in an early stage. Since 2021, the **Merck Digital Ethics Advisory Panel (DEAP)** has been focusing on complex ethical issues surrounding digital technologies.

Roles and responsibilities

One of the main tasks of the DEAP is to support us in developing digital applications responsibly while addressing ethics questions that could result from collecting and processing data as well as from the use of these innovative technologies. It issues recommendations for our entrepreneurial activities.

The panel comprises external international science and industry experts from the fields of **digital ethics, law,** Big Data **technologies, digital health, medicine,** and **data governance**. In addition, we involve bioethics experts as well as representatives from patient organizations as needed. The DEAP has its mandate from the Executive Board; our employees may submit topics for the panel to discuss. As in the previous year, the panel held four meetings in 2023. These focused on issues concerning the use of generative AI. Summary minutes of the DEAP meetings have been accessible on our intranet since 2023 insofar as they do not contain any business secrets. They also document the recommendations issued.

Our commitment: Guidelines and standards

As a company, we want to position ourselves in the digital ethics sphere. We are therefore developing clear ethical standards in this new field, primarily for critical areas, for instance handling health data. In this effort, we collaborate with various stakeholders and experts.

Together with the DEAP, we apply our **Code of Digital Ethics (CoDE)** in order to address questions pertaining to the **ethical use of data and algorithms**. The CoDE serves as a guideline for our digital business models, as a tool for analyzing ethical challenges, and a basis for practical DEAP recommendations. As one of our overarching governance documents, it applies to all employees and is publicly accessible as well.

The CoDE is based on five core principles: **justice, autonomy, beneficence, non-maleficence,** and **transparency.** These principles provide a clear structure for assessing ethical issues. Moreover, they support our business sectors as well as individual employees in difficult situations for which laws or other types of regulations do not (yet) exist.

The CoDE not only helps us to assess the ethical risks posed by existing activities, but also enables us to evaluate the ethical aspects of newly emerging digital solutions. To this end, we apply a **principle-at-risk analysis** (PaRA), which is based on the CoDE. We use the PaRA to examine ethical issues resulting from our

business as well as from the development of internal applications and new products. The DEAP uses the results of the PaRA as a basis for discussion. The PaRA method was described in the scientific journal Minds and Machines in 2023.

Developments in the field of generative AI, for instance ChatGPT, are growing in importance. All our business sectors are developing applications based on generative AI. To apply these innovative technologies responsibly and to the benefit of all, an ethical framework is currently being developed. The DEAP is intensively evaluating the guidelines. The aim is to roll out this framework company-wide in 2024.

Training on the ethical use of data and algorithms

In June 2023, online training on the CoDE was assigned to approximately 12,000 managers with personnel responsibility who can access the training in eight languages via our internal training platform. In addition, an advanced training course is available specifically for employees working in the fields of data science, AI and other digital areas of specialization. The course serves to illustrate the importance of the CoDE and empowers participants to make responsible decisions concerning the ethical aspects of data use and algorithms in digital products and business models. This course is also available to external stakeholders via our publicly accessible **website**.

Identifying risks

Since 2022, we have been looking at potential ethical risks that could result from projects by the Analytics Center of Excellence (ACE) of our Life Science business sector with the aim of developing suitable processes. The unit analyzes data from the business sector in order to obtain insights for our business.

In this connection, in June 2023, we launched a tool developed in-house for the **early identification of ethical risks** in ACE project management activities. This Merck digital ethics check is a semi-automated analysis mechanism. It uses existing project features to calculate ethical risks and proposes potential measures to mitigate them. The basis for this is a scoring system that creates a risk assessment for each project. Depending on the risk score, the ACE unit can draw conclusions for product development. In doing so, it includes all decisive stages in the product life cycle and examines them for their ethical risks. As of January 2024, every new project in the Life Science business sector is to be analyzed in accordance with our scoring system. The aim is to expand the Merck digital ethics check to projects across the entire company.

PRODUCTS

90 Sustainable innovation & technology

94 Products & packaging

- **94** Life Science
- **99** Healthcare
- **101** Electronics

106 Health for all

- **106** Global Health
- **114** Innovation sharing
- **116** Prices of medicines
- **119** Health capacity & awareness

124 Product safety & quality

- **124** Chemical product safety
- **127** Patient safety
- **133** Product-related crime

Sustainable innovation & technology

We are committed to creating solutions that positively impact people and the environment. To this end, we are determined to make discoveries that change the landscape of entire industries and drive technological as well as scientific innovation to solve the most critical issues of today and tomorrow. Customers, investors and regulators across our markets are increasingly seeking sustainable product solutions.

Our approach to creating sustainable innovation and technology

The sustainable innovation that we envision and 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 are already having 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 to upcoming regulations and integrating quantitative sustainability criteria into our product development processes across all business sectors.

In 2023, we continued our partnership with the patent information platform LexisNexis® PatentSight® and evaluated the sustainability impact of our intellectual property. In the reporting year, 29% (2022: 40%) of our patent families published had a positive sustainability impact. However, this key indicator is not comparable with the previous year's figure as the underlying UN SDG terminology has changed and the LexisNexis® PatentSight® concept has been adapted accordingly.

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.

We fuel transformative technologies through internal incubation, partnerships and strategic investments as well as through collaboration with academia. In addition, we continually seek to foster and encourage **open innovation** for healthcare products.

Roles and responsibilities

The organizational set-up of our R&D activities reflects the overall structure of our company. All three of our business sectors operate in independent R&D units that pursue their own innovation strategies. **Group Corporate Sustainability** supports our business sectors and Group functions to advance sustainability within the R&D and innovation processes. This includes the coordination and alignment of common core sustainability

criteria in line with our shared goals as well as quality and quantification requirements. In 2022, we created a Group-wide dashboard, showing the potential contribution of our R&D portfolio to sustainable solutions. In 2023, we integrated a procedure describing the global sustainability evaluation in our R&D process.

Our **Group Science & Technology Office** leads the implementation of our combined strategy for innovation as well as data and digital, enabling innovation across our business sectors while harnessing the power of advanced data and digital capacities. It aims to identify and integrate transformative and strategically relevant technology trends into our business sectors while maintaining a Group-wide overview of our tech roadmap and innovation portfolio. Fostering data and digital capacities is key to accelerating sustainable innovation and enabling rapid action and personalized offerings. Innovation projects are incubated either through our corporate innovation teams or in the business sectors.

Our venture capital fund, M Ventures, prioritizes sustainable innovations through equity investments. The fund's mandate is to invest in innovative technologies and products that have the potential to significantly impact our core business areas. In addition, the fund focuses on investments in two areas of high strategic relevance to our company: digital technology and sustainability.

M Ventures' sustainability investment strategy follows two fundamental approaches. First, it invests in sustainable solutions relevant to our three business sectors, such as novel solutions for reducing emissions and waste, green life science technologies and green electronics technologies. These solutions may be more energy- or resource-efficient or may create products designed for circularity or with a lower carbon footprint. As many of these technologies are still in their early stages, M Ventures is partnering with **SEMI.org** along with the leading corporate venture capital funds to help accelerate the innovation and adoption of potential sustainable semiconductor solutions. The second approach involves making investments that leverage our core competencies to drive sustainability in other markets. These may include start-ups addressing sustainable foods, bio-manufacturing or carbon capture and utilization.

Our commitment: Aiming for circularity

Within our R&D processes, we are committed to continuously improving and integrating sustainability and circular economy criteria to assess the **sustainability performance of our products and portfolio**, enabling us to create more sustainable products for our customers and society. We have integrated and tailored Design for Sustainability (**DfS**) across all business sectors and use our overarching dashboard to monitor progress on key sustainability criteria. In 2023, we assessed allmost all relevant R&D projects and thus enhanced transparency around the sustainability performance of our global R&D portfolio. We integrated a sustainability in R&D key indicator to track progress and continued advancing the use of evaluation tools such as **DOZN™** and **GreenSpeed**. We aim to combine the insights from the R&D dashboard with those gained from our commercial portfolio evaluation to steer our future R&D activities.

We have dedicated corporate resources for **our circular economy strategy** and we are driving several circular economy pilots and initiatives throughout the organization. In addition, we held a global circular economy summit to provide a platform for best practice sharing with internal and external participants.

More information on sustainable product design can be found in the **Sustainable products & packaging chapter**.

Accelerating the future of food: Cultured meat

Our Cultured Meat Innovation Field focuses on the biotechnology required to grow real meat in a bioreactor. These research and commercial efforts aim to enable animal protein production that is healthier, more ethical and environmentally sustainable. As a **technology enabler**, we are leveraging our vast life science expertise to realize our vision of providing fit-for-purpose bioprocessing products and services for cultured meat production. To achieve production at scale, the cell culture media must be cost-efficient, produced from a robust food-grade raw material supply chain, suitable for effective growth and differentiation into specific cell types, and free of any animal-derived material such as fetal bovine serum. Our flagship project, **MeatDia**, aims to build a food-grade raw material supply chain via performance testing in research labs and qualification in our production facilities to manufacture optimized media formulations. We supply dry powdered cell culture media to customers who are bringing the first cultured meat products to market.

Another technological challenge is the need for suitable bioreactor designs to efficiently produce structured cuts of meat rather than lesser-value ground meat. **CraftRidge** is our flagship bioreactor project focused on delivering an edible hollow fiber bioreactor system that can produce entire cuts of meat cost effectively. At the same time, we are collaborating with three **leading academic labs.** Together with a team at Tufts University in Massachusetts, USA, we aim to enable the production of whole-muscle cultured meat through textile bioengineering. At the same time, we will apply industrial rapid printing technology to **create complex meat structures** in collaboration with a team at the Technical University of Darmstadt (TU Darmstadt) in Germany. In a third project with the University of Illinois, we are developing an electrochemical technology to recycle the cell culture media, enabling more sustainable cultured meat production.

Our M Ventures portfolio includes Mosa Meat, a pioneer in cultured meat, and Formo, a company focused on making cultured cheeses using recombinant protein synthesis.

Empowering sustainability through collaboration

We contribute and engage in numerous consortia to leverage the development of standards and measures for sustainability across companies and industries, including the American Chemical Society Green Chemistry Institute Pharmaceutical Roundtable.

Many key players have set the goal to reach net-zero carbon emissions by 2040. To achieve this goal, it is essential to track and control upstream and downstream indirect emissions, which make up a significant part of each company’s carbon footprint. A lack of data transparency across the supply chain poses a challenge yet presents an opportunity for innovation and industry collaboration, as is the case in the semiconductor industry.

We are collaborating with Palantir to address the lack of emissions data transparency in the semiconductor value chain. The 50/50 partnership Athinia™ is an independent platform that provides a secure and semiconductor-specific data analytics tool for the industry. With the cloud solution for the ecosystem, data from various isolated sources can be integrated, enabling seamless collaboration in the industry. As a founding member of the Semiconductor Climate Consortium (SCC), Athinia™ is pioneering sustainability standards on a digital platform, enabling companies to benchmark their emissions performance against industry peers, identify areas for improvement and collaborate on initiatives for reducing emissions.

Fruitful strategic partnership

Our long-term commitment to academic research partnerships reflects our strong ambition to find sustainable solutions to pressing problems. In the framework of the **Sustainability Hub** we continued our strategic collaboration with the TU Darmstadt in multidisciplinary fundamental research projects. The projects cover basic challenges of life cycle modelling, 3D liver tissue model, biodegradation of plastics, and the simulation of neuromorphic computing architectures. The research continues to increase our understanding of product sustainability assessment, toxicological testing of drugs, circular material flows, and energy efficient computing, respectively. In 2023 we evaluated additional proposals to further expand our research project portfolio.

Promoting visionary research

The **2023 Future Insight Prize** recognized achievements that are helping to build a global pandemic early warning system. The € 500,000 prize was awarded to Professor Khalid Salaita, Samuel Candler Dobbs Professor of Chemistry and Director for Graduate Studies in the Chemistry Department at Emory University in Atlanta, Georgia, USA. His research focuses on solutions that enable the development of a novel platform technology for automated, real-time surveillance and tracing of airborne pathogens.

In 2023, we again offered a sustainability research grant in the field of green hydrogen to the scientific community. We received over 250 research proposals from around the world and will select one project to receive funding in 2024. Our Collaboration with Esy-Labs GmbH, the winner of one of our research grants in 2021, is being continued and is now part of the Electrifying Technical Organic Syntheses (**ETOS**) Cluster, a cluster initiative founded by the German Federal Ministry of Education and Research.

Sustainable products & packaging

Life Science

In our Life Science business sector, we use data-driven methods to reduce the adverse impacts of our products on health and the environment. Our approach covers **the entire product life cycle**, from sourcing, manufacturing and packaging to use and end-of-life. At the same time, we aim to make our products more efficient and user-friendly. We work to reconcile these requirements at the beginning of product development and when re-engineering existing products.

Our approach to sustainable product design

We take a **systematic approach** to advancing sustainability through enhanced product design. In 2023, we continued to differentiate our sustainability portfolio through our Design for Sustainability framework.

To understand the potential environmental impacts of each product throughout its life cycle, we conduct streamlined product life cycle analyses. Their findings help us 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 throughout the process.

Design for Sustainability enables our product developers to analyze product impacts regarding materials used, energy and emissions, water, packaging, usability, innovation, circular economy, and supplier- and manufacturing-related issues. Our product developers use these sustainability criteria to assess product performance in each category across our broad and diverse portfolio. When developing new products, we aim to improve as many of these criteria scores possible.

To ensure that our product development teams target and track sustainability improvements in all new products, the framework provides data-driven deliverables at each phase of the development cycle, including a scorecard system that helps our development teams address and minimize negative product- and supply chain-related factors. The scorecard also helps us communicate our product sustainability data to customers more effectively. Products with meaningful sustainability improvements are identified as Greener Alternative Products in our Life Science portfolio.

As of December 2023, we offer over 2,500 Greener Alternative Products across our portfolio, a 34% increase compared with 2022. In the course of 2023, 637 products were recognized as Greener Alternative Products across our portfolio – 404 of which were new products evaluated using our Design for Sustainability framework.

Our approach to sustainable packaging

We work to deliver our products in packaging that is safe and easy for customers to handle, while also working to improve the sustainability characteristics of our material choices.

With a vast number of products in our Life Science portfolio – ranging from antibodies and lab chemicals to filtration materials, systems and instruments – we face a broad range of packaging challenges. Through our **SMASH Packaging** program for Life Science, we work to improve the sustainability characteristics of our packaging by optimizing resources, using more sustainable materials and designing for a **circular economy**.

SMASH Packaging is built upon four pillars:

- **Shrink:** reduce the amount of packaging
- **Secure:** achieve zero deforestation
- **Switch:** improve plastic sustainability characteristics
- **Save:** maximize recycling

While we did not reach all **2022 targets** set in our inaugural SMASH Packaging plan, we were able to integrate systematic internal changes to strategically address packaging sustainability, notably to track and implement sustainability in new product packaging. As such, we have we have integrated our previous commitments and increased our ambition through **SMASH Packaging 2.0**, the next generation of packaging sustainability. In 2023, we raised the bar further for our packaging sustainability framework and developed a more systematic implementation plan for internal teams to implement packaging sustainability improvement projects. We aligned these guidelines directly with our **new 2030 goals** with a 2020 baseline to maximize the related sustainability improvements:

- Reduce 10% of packaging weight per unit sales by 2030.
- 100% of fiber packaging to be deforestation-free by 2030.
- 100% of packaging to be designed following circular design principles by 2030.

Roles and responsibilities

The Life Science business sector works across its operational units to holistically embed sustainability in its operations, products and culture. The business sector's Sustainability and Social Business Innovation team is responsible for setting KPIs and targets, planning and executing our strategies, and overseeing monitoring and reporting activities.

This structure helps us implement an ambitious and coordinated sustainability strategy to formalize our processes, governance and goals. In this way, we can embed the strategy in our business and become a sustainability multiplier for our customers.

Our commitment: Chemicals and product policies

In order to meet the product safety regulations relevant to our company, our Regulatory Affairs Group Policy details Group-wide processes for managing and implementing product safety, including the necessary management structures.

Wide range of solutions

Bio-based solvents

Switching to bio-based solvents, such as our alternative, greener solvent **Cyrene™** and Cyrene™ blends, helps our customers reduce their carbon footprint. We are a member of the EU Horizon 2020 project, ReSolute, which began constructing a new Cyrene™ production facility in France in 2021. The site is scheduled to open in 2025 and will produce 1,000 metric tons of Cyrene annually to help us meet the growing demand for greener solvents. We will continue to add new bio-based solvents to our portfolio in 2024 – not only for our customers but also for our own internal applications in manufacturing. In 2023, our diverse portfolio of bio-based solvents helped customers avoid over 50 metric tons CO_2e.

Green chemistry evaluator tool

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 through the "Green Scores" calculated in the tool. DOZN™ industrializes the 12 Principles of Green Chemistry, a previously theoretical framework, and **rates products** in three stewardship categories, namely "Improved resource use", "Increased energy efficiency", and "Reduced human and environmental hazards". DOZN™ 2.0 is the tool's external interface and is free for anyone to use, enabling both our customers and other scientists to make **more environmentally sustainable choices** in their development processes.

In 2023, we counted nearly 2,200 users of DOZN™ from 78 countries and DOZN™ was cited in 87 academic papers. In addition, as of the end of 2023, DOZN™ had been integrated into 15 university curricula through partnerships with universities in Canada, France, Germany, India, Switzerland, the United Kingdom, 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. Firstly, it increases access to **Green Chemistry** and the tangibility of its principles for the future scientists entering the workforce. Secondly, it provides a practical opportunity to calculate scores for chemical products and processes and reinforces learning while highlighting the importance of sustainability to future scientists.

Expanding circular recycling

We have continued expanding the **biopharma recycling program** we kicked off in 2015, in which single-use plastic product waste is collected from biopharmaceutical manufacturing operations and **recycled into plastic lumber**. This material can be used in many industries, such as landscaping, transportation and marine construction. The program now serves 23 major biopharma manufacturing customers. Since its launch in 2015, it has recycled approximately 11,045 metric tons of plastic waste. This program continues to expand throughout the United States while simultaneously exploring new options and recycling technologies in other regions, such as Europe. By assessing advanced recycling technologies and collaborating across multiple industries, we will develop innovative **circular recycling** programs.

In October 2022, we developed a strategy to increase the recycling rates of single-use plastics and the circularity of our Life Science products. Our approach relies on customer engagement and feedback to assess the types and volumes of plastics used. In 2023, we engaged with 72 customers and instructed them on how to conduct plastic waste assessments in their labs.

Based on insights gained from these assessments, our Product Recycling and Innovation team is developing solutions to address plastic waste in labs and facilitate transfers to specialized recyclers worldwide. Ultimately, we aspire to enable all high-quality plastics to be reintegrated into our Life Science supply chain to form an industry-wide recycling ecosystem.

More sustainability offerings for Process Solutions

In 2023, we launched two new Greener Alternative Products in our Process Solutions portfolio: Millistak+® HC and Millistak+® HC Pro Micro 20 clarification devices. These products significantly reduce the amount of single-use plastic needed. By redesigning the shape of the devices, we reduced the amount of plastic used by 75%, resulting in 75% less related single-use plastic waste. The Millistak+® HC Pro Micro 20 device even provides improved scalability performance and can more accurately predict the size of process-scale depth filter installations required for full-scale cell culture harvest applications.

Embedding sustainability in our packaging

Within the scope of our SMASH Packaging strategy for more sustainable packaging, we are pursuing a number of projects for the Life Science business sector:

Packaging sustainability in product development

New product packaging is where we can achieve the greatest impact. For this reason, we have also integrated SMASH Packaging principles into our product development process under our Design for Sustainability framework.

In 2023, 65% of our new product development projects aligned with the sustainability standards in at least one of the four pillars of our SMASH Packaging strategy.

Shrink: How we minimize the amount of packaging

We seek **eco-friendly alternatives** for shipping our products safely, which is why we partnered with a biotech company a few years ago and jointly developed a more sustainable bulk packaging design for transporting our **Millistak+®** Pod Disposable Depth Filters. We also expanded this approach to a subset of our Durapore® and Millipore Express® filter cartridges. These products are dedicated to high-volume clients and deliver both environmental and economic benefits to our customers compared with traditional individual or multipack packaging.

For example, changing from a three-pack to the new bulk packaging for our ten-inch filter cartridges reduces the amount of corrugated cardboard required by 55%. This corresponds to a 49% decrease in greenhouse gas (GHG) emissions throughout the life cycle of these packaging materials. In addition, our customers spend approximately 50% less time unpacking, which reduces their labor costs. In 2023, these bulk packaging solutions saved around 50 metric tons of corrugated cardboard. We continue researching similar solutions for additional products.

Secure: How we’re moving towards zero deforestation

Deforestation is a significant driver of global warming and a threat to biodiversity worldwide. As a large proportion of our packaging contains wood-derived fibers, we aim to responsibly source wood and fiber-based packaging materials so that that we do not contribute to deforestation.

Each year, we assess the practices of our main suppliers and the characteristics of our packaging to monitor our progress toward our zero-deforestation goal. The evaluated suppliers represent the majority (98%) of our total direct spend on sourcing wood and fiber-based packaging. The assessments identify opportunities to further align packaging with our zero-deforestation standards, selecting packaging with **sustainable forestry certifications** or recycled materials.

As of December 2023, more than 70% of the packaging materials we source align with our zero-deforestation standards or are made from recycled materials.

Switch: How we substitute plastics

In the past, we used insulated containers made of expanded polystyrene (EPS) to ship our chemicals in glass bottles and our temperature-controlled products. While EPS provides good insulation and cushioning properties, it is a petroleum-based material that takes hundreds of years to decompose. As options for recycling EPS are limited, it is typically incinerated or sent to landfill.

Wherever possible, we are replacing EPS with molded **components made of cellulose and recycled paper pulp**. Our molded pulp components can be easily recycled with other paper materials and compacted together for storage and transport. We use molded pulp inserts to pack a variety of liter bottle configurations in shipping boxes, thereby replacing around three million EPS parts per year.

In 2023, we continued piloting our new **greener coolers** at one of our U.S. distribution centers to replace EPS in our cold-chain shipments. The greener cooler is made from renewable resources and is certified recyclable with corrugated materials. We conducted further investigation on our requirements and potential solutions for using a greener cooler in our European markets. In 2024, we aim to roll out these greener coolers to our major U.S. distribution centers. We also aim to begin implementing at some of our key European distribution centers for both wet and dry ice shipments.

Save: Enabling proper disposal of packaging

To help our customers correctly dispose of and recycle our product packaging, we have developed a catalog of identification codes for all our packaging materials. In 2023, we began offering specific **recycling guidance** for customers in Italy to facilitate the collection, reuse, recovery, and recycling of packaging materials. We also published disposal guidance for customers in other major markets including Germany, the United Kingdom and the United States. We will continue developing country-specific guidance for each of our major markets globally.

Healthcare

We believe it is our duty to consider the sustainability performance of our products throughout their life cycle, starting with the development stage.

Our approach to sustainable product design

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.

In 2023, we have worked on an update of our healthcare overarching strategy to make our medicines, our medical devices and their packaging more ecologically sustainable and user-friendly. The update strategy is planned to be deployed in 2024.

We are working to advance environmental compatibility across various phases of the **healthcare** value chain. For example, in pharmaceutical development, we have defined an ecotoxicological testing strategy that involves identifying environmental properties of drug candidates early in development. Ideally, we can then use this knowledge to avoid any harmful emissions into the air and water.

In 2023, we continued to implement the Design for Sustainability framework in our Healthcare R&D approach. The initiative includes establishing a governance framework to integrate sustainability more effectively during product development. It also involves defining **sustainability criteria** for qualitative and quantitative scorecards we can use to measure our sustainability impacts.

Our approach to sustainable packaging

In 2023, the Healthcare business sector continued to implement MPact, our sustainable packaging initiative that is aligned with our Global Healthcare Operations strategy. MPact investigates product packaging solutions to reduce the overall environmental impact. Its three primary objectives are to reduce Scope 3 GHG emissions, to reduce packaging materials while increasing the circularity of packaging, and to assess replacing secondary and tertiary plastic packaging by 2030. MPact also analyzes the requirements of the European Packaging and Packaging Waste Regulation (PPWR) in order to be ready, aligned and compliant in the upcoming years.

Meanwhile, we continue to implement various initiatives to reduce our product packaging, switch to more sustainable materials and promote recycling and circularity.

Roles and responsibilities

Our Healthcare business sector has integrated sustainability across its R&D and operating units. The implementation the sustainability strategy is steered by the Healthcare Executive Committee. Any decisions made regarding sustainability objectives are cascaded to the corresponding units, which are responsible for implementing measures to achieve these objectives.

Our commitment: Chemicals and product policies

Within our Healthcare business sector, chemical product safety is a key sustainability aspect when developing, producing and distributing products. We strive to comply with relevant legal requirements regarding chemicals regulations, hazard communication and local and regional chemical registration activities.

We have an intranet page on chemical regulations for the Healthcare business sector that is aligned with our Group-wide EHS policy. It provides a framework and information on exposure limits, Predicted No Effect Concentration (PNEC)s, Globally Harmonized System (GHS) classes and categories, safety data sheets, labeling products according to **GHS requirements**, etc.

Further information can be found under **chemical product safety**.

Making product design and packaging more sustainable

Green Biotech

Launched in 2022, our **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 the 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.

Compete to Green

During the reporting year, we added various sustainable product design and packaging initiatives to our **Compete to Green program**. This transformation program aims to comprehensively integrate sustainability across our business. We are currently applying the Principles of Green Chemistry to support our vision of designing sustainable products.

Slim packaging solutions

Launched in 2021, **Slim Pack** requires fewer raw materials, reduces transport volumes and is more convenient for customers and patients as it requires less storage space.

Since 2021, thanks to Slim Pack, we have reduced the ecological footprint of our Pergoveris®, Gonal-f® and Ovidrel® fertility pens by design. Slim Pack is 40% smaller than its predecessor and it is 100% free of plastic components. Plastic trays holding the pens were replaced by a paper carton alternative.

In 2023, the introduction of Slim Pack continued in further European countries. Its global rollout is expected to be completed in 2025.

Take-Back fertility pen pilot

To progress towards complete end-to-end sustainability for our Fertility portfolio – from manufacturing to patient use – we launched with consortium partners the Take-Back pilot program in Denmark in 2023. Through this program it is possible to hand in used injection pens from our company at fertility clinics throughout Denmark. The 12-month pilot program allows patients to return their used **fertility injection pens** for recycling. It aims to achieve a 25% return rate. The pilot aims to achieve a 75% recyclability rate of the returned pens to recycle their plastic, glass and metal.

Electronics

Within our Electronics business sector, we are committed to shaping the digital transformation in a sustainable way. Guided by our commitment to sustainability, we embrace a comprehensive approach in assessing and developing our product portfolio. This starts at the R&D stage and includes supporting our customers with their sustainability endeavors and actively collaborating with our partners in the industry to help solve existing sustainability challenges.

Our approach to sustainable product design

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 aim to embed sustainability into our operations and apply strict sustainability criteria to prioritize new green and innovative materials that deliver sustainable value to our customers. We also believe in the importance of collaboration to reach ambitious sustainability goals and proactively engage in partnerships with our customers to collectively drive more sustainable value creation.

Our holistic approach comprises the following elements:

- **Sourcing responsibly**: As a member of the **Responsible Minerals Initiative**, we support the responsible sourcing of minerals, such as tantalum, tin, tungsten, gold, and cobalt. Our efforts help the respective supply chains make positive contributions to global, social and economic development.
- **R&D**: In 2023, we continued to implement a sustainability scorecard, which enables us to focus on sustainable criteria while developing products and solutions across all Electronics R&D projects. All our R&D projects successfully underwent sustainability assessments using this scorecard. Its detailed evaluations offer a comprehensive overview of our innovation portfolio and how it contributes toward our own sustainability goals as well as the United Nations Sustainable Development Goals (UN SDGs).
- **Process development**: We have implemented a digital tool that automatically calculates sustainability indicators, including process mass intensity as well as solvent and water intensity. It enables us to perform carbon footprint modeling and analyze the impact of recycling as well as the energy needed for individual process steps. It also enables R&D scientists to select the most sustainable synthesis route as early as possible. The tool helps us to more effectively steer our future portfolio.
- **Sustainability Performance Assessment of the current product portfolio:** In 2023, we continued the pilot review of our product portfolio to understand its 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. Our Product Sustainability Committee oversees the sustainability assessment process and results.
- **Contributing to our customers' sustainability goals:** We work to establish partnerships with our customers to optimally understand how our products and activities can contribute to their sustainability goals and to work towards solving the sustainability challenges of our industry. For example, we are actively involved in collaborations to develop and produce new process gases with a lower global warming potential. We also established a partnership to fund a new academic research program for more sustainable innovations in the semiconductor industry.

- **Continuous improvement through digitalization:** We aim to strengthen the use of data and digital solutions to further improve processes and implement sustainable changes. For example, we have analyzed the carbon emission drivers at the production batch level for a selected product. The proposed re-design of the process has enabled our teams to implement new and innovative steps that have reduced waste by approximately 35% compared with the original production batch. Carbon emissions have also been reduced through the application of the re-designed process.

Roles and responsibilities

We have implemented a sustainability governance structure across our Electronics business sector to ensure that we effectively implement our sustainability strategy across all Electronics business units. Since mid-2023, three different committees – the Commercial Leadership Board, the Supply Chain Leadership Board and the Technology Leadership Board – have been taking sustainability-related decisions, each in their area of expertise and responsibility. In addition, a dedicated sustainability program team coordinates sector-related sustainability activities. The team orchestrates key initiatives across all our Electronics business units in support of our **sustainability strategy**. In 2023, we also established an Electronics-wide sustainability network to closely connect sustainability experts and representatives across our business and to ensure integration and alignment of activities.

Our commitment: Adhering to chemicals and product policies

Product safety is one of our highest priorities. Starting at the development stage, we investigate potential adverse impacts that chemical substances may have. We aim to meet all statutory requirements along the entire value chain for our chemicals.

Within our Surface Solutions business unit, we aim to meet the strict standards of the EU Cosmetics Regulation for all our raw materials intended for the cosmetics industry. In addition, these raw materials should be produced in line with Good Manufacturing Practices for Cosmetic Ingredients (**EFfCI** GMP).

Adhering to the Convention on Biological Diversity

We support the general principles laid out in the **Convention on Biological Diversity** (**CBD**), especially the third objective: the fair and equitable sharing of benefits arising from the use of genetic resources and traditional knowledge in accordance with the terms and conditions of the Nagoya Protocol. This is an international supplementary agreement to the CBD. A key element of this principle is access and benefit-sharing, which ensures that countries providing genetic resources and traditional knowledge also benefit from their use.

We apply a Group-wide standard entitled Access to Genetic Resources, the objective of which is to define requirements, roles and responsibilities to ensure compliance with the Nagoya Protocol, even in countries that are not party to it.

We have established an internal exchange across our business sectors for aligning and sharing information on initiatives related to access and benefit sharing. In 2022, we successfully filed a due diligence declaration for two product developments with a genetic resource to the **German Federal Agency for Nature Conservation** (Bundesamt für Naturschutz, **BfN**) in accordance with current EU regulations. Based on one of the BfN's recommendations, we established a collaboration with the University of Oldenburg (Germany) in 2023. This new information exchange aims to clarify the practical implementation processes and enable improvements for authorities and the industry.

A wide range of solutions

Colloida silica

We began introducing **next-generation colloidal silica products** with increased efficiency, significantly reducing the amount of silica required per wafer. This supports the efforts of our customers in the semiconductor materials industry to use more environmentally sustainable materials, while improving performance and reducing costs. Our latest particle designs can achieve a 60% to 90% reduction compared with the original formulations. This innovation also enables silica to be supplied in concentrated form, reducing its packaging and transportation requirements by a similar degree. Customer feedback has been promising and we are continuing to work together to integrate these new products and reduce the environmental footprint of semiconductor manufacturing.

NMP-free removers

The production process for semiconductor devices requires numerous cleaning steps to remove the photoresists used to pattern the circuit design. These cleaning methods require complex solvent chemistries that selectively remove these photoresists without damaging the sensitive electronic components.

In many cases, however, the most effective solvents also pose significant environmental hazards. For example, NMP, a mainstream solvent common in wafer cleaning, is highly toxic and classified as an SVHC (Substance of Very High Concern) under the European Union's **REACH regulation**. In response, we have continued expanding our portfolio of formulated cleaners and have committed to not using NMP in new product development.

PFAS replacement program

Per- and polyfluoroalkyl substances (PFAS) have unique chemical properties and are widely used in our daily lives. Today, the highly complex manufacturing of chips is impossible without process chemicals containing PFAS. At the same time, persistent PFAS exposure may lead to adverse effects for the environment and human health. We therefore support the search for PFAS substitutes and are actively conducting our own research in this area. We also work in close consultation with our customers on products and solutions for replacing PFAS. We already offer alternative products for some applications. For example, we have made progress in replacing PFAS surfactants in our products with non-PFAS alternatives in photoresists, solvent-based bottom antireflective coatings as well as rinse solutions and are transitioning our customers to the new versions.

Dynamic liquid crystal glazing

Liquid crystal dynamic window glazing automatically adjusts its tint level within seconds based on weather conditions. The self-darkening glazing effectively regulates glare and solar heat gain without blocking the view. As a result, it increases occupants' visual and thermal comfort while reducing life cycle GHG emissions by 40% compared with conventional outside shading. We offer these products under the **eyrise®** brand. Real estate investors regard eyrise® as an important way to help them deliver on their ESG targets and have installed more than 10,000 m^2 of our product since its launch in the premium commercial segment in 2021.

Natural cosmetic ingredients

We continuously work with our partners in the cosmetics industry to find more natural cosmetic ingredients that comply with strict criteria. As of the end of 2023, 103 of our cosmetic pigments and active ingredients had been confirmed to be compliant with Ecocert’s COSMOS standard for organic and natural cosmetics. The review, based on COSMOS’s new standard version 4.0, was completed for 98 cosmetic ingredients. We have also obtained **halal certificates** for all our cosmetic ingredients.

Vegan cosmetic products

A growing number of consumers view the use of non-animal and non-animal derived ingredients, i.e. **vegan and plant-based raw materials**, as a critical product attribute. Therefore, the majority of our cosmetic raw materials, including our special effect pigments and functional fillers, contain no components of animal origin, by-products or derivatives and are thus suitable for vegan cosmetics.

Making product packaging more sustainable

Our Electronics business sector uses a variety of packaging types, each tailored to the specific needs of the individual business units and with its own unique sustainability characteristics.

Reusable packaging

The packaging for specialty gases, thin films and some patterning products manufactured by Semiconductor Materials is designed to be reused. Our reusable packaging types include various sizes of cylinders and tube trailers for bulk specialty gases, smaller stainless steel and quartz containers for thin films and totes and drums made of high-density polyethylene for patterning.

Once our customers have used the product inside the container, the used containers are returned to our production facility for cleaning, refurbishment and refilling. This cycle greatly reduces the number of containers to be disposed of. It reduces demand for the manufacture of new containers and the associated resource requirements, thus moving us **closer to a circular economy**.

Plastic drum recycling

Our facility in Dallas, Texas (USA) specializes in producing materials and solutions for the semiconductor industry, with a focus on the planarization product portfolio. Typically, these raw materials are transported in plastic drums that are ultimately discarded as waste at the end of the production process. We have successfully developed ways to shred the drums and convert them to high-density polyethylene, a new raw material with multiple applications. Through this initiative, we processed more than 64 metric? tons of waste and eliminated drum disposal costs. We also expanded the reach and benefits of this recycling solution by processing waste from a customer’s facility.

Recyclable packaging

For large quantities of products in our patterning and planarization business, we use totes for packaging. Totes are typically made of **high-density polyethylene**. One of our main tote suppliers has a recycling program in place that our customers can also use. Each tote from this supplier has a return ticket attached to it and the supplier picks up the used tote so that its parts can be reused or recycled.

Redesign packaging labeling approach

With Iriotec® 8000 pigments, we enable inkless printing with contact-free and durable laser marking technology. These pigments make it possible to mark plastics, which in turn makes them easier to trace and recycle, restoring value to used plastic packaging. The **laser marking** provides a unique identifier and acts as a digital product passport between the product and the database. It can replace ink and paper labels, reducing the waste associated with label removal.

In 2023, we showcased ways to improve the circularity of plastic packaging, highlighting the aesthetic appeal of effect pigments combined with the functionality of a laser marking additive in post-consumer recycling polymers. We collaborated with customers to demonstrate that recycling packaging containing effect pigments and laser marking has no impact on plastic sorting and provides attractive coloration after recycling. This approach enables the pigments to be reused in the production of new plastic products. We also started to promote this cosmetic packaging by using laser-marked, label-free tubes in our selected sample cosmetic kits.

Health for all

Global Health

Half of the world's population lacks access to essential health services. Therefore, we are striving to innovate, make health solutions affordable and accessible, raise awareness about diseases, and help people learn how to manage them. We work with partners to tackle these complex challenges

Our approach to improving health equity

Our overarching objective is to drive health equity. We are committed to advancing global health and to using our scientific and technological innovations to improve the health of underserved populations in low- and middle-income countries.

Our **Global Health strategy** aims to develop and provide access to health solutions in low- and middle-income countries by creating equitable and **sustainable access mechanisms** for patients and society. Besides enabling access to our healthcare portfolio, our strategy focuses on diseases that disproportionally impact underserved populations. These include the neglected tropical disease (NTD) **schistosomiasis**, which is largely unknown in industrialized nations and attracts little attention or funding, and **malaria**. Specifically, the goals of this strategy are to:

- Expand access to our healthcare portfolio of innovations and products to patients in low- and middle-income countries.
- Drive the elimination of schistosomiasis as a public health problem.
- Catalyze innovative solutions for global health challenges, primarily targeting schistosomiasis and malaria. In particular, we strive to reach those who are most vulnerable, namely **women** and **children**.

Three core operating principles drive the execution of our Global Health strategy:

- **Pioneering solutions:** We develop new medicines and support the development of diagnostics for schistosomiasis as well as new treatment options and vector control solutions for malaria through our integrated science and technology approach.
- **Engaging with cross-sector partners:** We participate in multi-stakeholder global health platforms to amplify the impact and shape the progress of the United Nations (UN) Sustainable Development Goals. We join access alliances and create partnerships to implement our programs.
- **Creating sustainable business models and opportunities:** We strive to increase our company's competitiveness and value while delivering long-term benefits to society by reaching underserved populations with our products and technologies.

We also engage **in building capacity and expertise** across the value chain to strengthen health systems in low- and middle-income countries.

Our Access to Medicine approach

We strive to make health solutions available, affordable and accessible to all. As part of our sustainability strategy, we are implementing our access strategy for **low- and middle-income countries**. This will help us fulfill our ambition of serving a total of **170 million patients annually** across these countries by 2030. In 2023, we reached around 140 million patients.

Our strategy comprises two important aspects. First, we aim to accelerate and expand access to more than **80 million patients by 2030** with our healthcare innovations and portfolio of products for non-communicable diseases, such as cancer indications and endocrine disorders (more details about our SHAPE program can be found under **Prices of Medicines**). This strategy integrates a systematic approach to drive health equity and enables us to:

- Enhance our impact through equitable pricing to improve affordability while strengthening health systems.
- Ensure more patients can access our existing innovative therapies in a broader range of countries.
- Improve access to our healthcare innovations through our systematic approach to R&D access planning. Our objective is to ensure that future registrations in low- and middle-income countries are implemented within 12 months of the first global launch, such as in the European Union and the United States.

Second, we are continuing our efforts to eliminate the neglected tropical disease schistosomiasis as a public health problem. We aim to reach more than **90 million patients per year by 2030** through donations and new sustainable access models for established treatment and innovations. In the reporting year, we reached 84 million patients. We also invest in the fight against malaria.

Eliminating schistosomiasis as a public health problem

Schistosomiasis, also known as bilharzia, is a tropical disease caused by parasitic worms. The disease affects **almost 240 million people** worldwide and **kills an estimated 200,000 people** every year. More than 90% of cases are in sub-Saharan Africa, significantly burdening public health systems and local economies.

The ultimate goal of our schistosomiasis-related work is to eliminate the disease as a public health problem in line with the World Health Organization (WHO) **NTD Roadmap 2021-2030**. We are committed to the objectives of the **Kigali Declaration** on NTDs, in which participating companies, governments and private organizations commit to helping control and ultimately eliminating the 21 most prevalent NTDs, including schistosomiasis.

To achieve the elimination of schistosomiasis, we have adopted an integrated strategy, which we are implementing in close collaboration with multiple partners worldwide. The approach focuses on four pillars:

- **Treatment:** We donate up to 250 million tablets of praziquantel to endemic countries every year in partnership with **WHO**. Nearly 50 years after its development, praziquantel remains the standard of care for the effective treatment of schistosomiasis around the world.
- **Research and Development (R&D):** We advance R&D to support the global fight against schistosomiasis. In particular, we drive collaborative programs for a next generation of drugs, for the development of **arpraziquantel**, a new treatment option for children aged six and under, and for new and more sensitive diagnostics. We also build **research expertise and capacity** through our collaborations with institutions in endemic countries.
- **Behavioral change:** We believe prevention is the most effective health intervention. Therefore, we invest in behavior change initiatives to raise awareness of the causes and dangers of schistosomiasis and teach people how to prevent it. Since the disease is transmitted through contaminated water, we have also supported WASH (water, sanitation and hygiene) projects with the aim of preventing transmission of the disease by providing functioning sanitary infrastructures and access to clean water.
- **Advocacy and partnerships:** We accelerate the progress towards schistosomiasis elimination through partnerships as well as through the dialogue with the wider stakeholder community, for example via the Global Schistosomiasis Alliance (**GSA**).

Preventing and fighting malaria to support elimination

According to WHO estimates, almost half of the world's population is at risk of contracting malaria. The latest annual figures report over **240 million cases of malaria** and more than 600,000 related deaths, with around 80% occurring in children under the age of five. Currently, 95% of cases and deaths occur in Africa.

There is a growing need for new medicines to overcome increasing drug resistance, as well as additional preventive measures to achieve the ultimate goal of elimination. Through our **As One Against Malaria program**, we develop and help deliver integrated health solutions to fight this deadly disease.

Roles and responsibilities

Our Global Health organization is responsible for Group-wide initiatives, programs and sponsorships. Our experts work closely with the business sectors to internally leverage our common strengths and competencies. Our Global Health team also works with a broad range of international and local partners.

Our Health Equity (formerly Access to Health) unit extends the reach of our Healthcare portfolio in low- and middle-income countries. It leverages a strategic approach and shared value initiatives implemented in collaboration with our global and country teams.

Working closely with external partners (such as WHO), our **Schistosomiasis Elimination Program** executes initiatives to contribute to the elimination of schistosomiasis as a public health problem by 2030.

Our **Global Health Institute** catalyzes innovations for global health challenges by translating science, technology and digital approaches into transformative, integrated health solutions (e.g. treatments, diagnostics, technologies, and preventive measures) to fight schistosomiasis and malaria.

Our commitment: Providing a solid basis for access to health

Our commitment to expanding health access is summarized in our **Charter on Access to Health in Developing Countries**.

Every two years, the **Access to Medicine Foundation** publishes **the Access to Medicine Index**. The Index benchmarks 20 of the world's largest research-based pharmaceutical companies on activities and initiatives that experts consider most relevant for access to medicine in low- and middle-income countries. We use the results of this benchmarking to inform our strategy.

The latest Index was published in November 2022. We **ranked fifth**, moving up from eighth place in the previous ranking. Our ranking is mainly attributable to our strong performance in the areas of research and development, intellectual property and capacity building.

Sustainable access to medicines in low- and middle-income countries

We apply access models for global health, including donations (e.g. praziquantel), and work with partners to explore new procurement models for equitable and **sustainable access** to established treatment and innovations for NTDs.

To prevent and control high-burden **non-communicable diseases (NCDs),** we invest in access initiatives that address health system gaps in low- and middle-income countries. We adopt a partnership approach to maximize our impact in this complex and challenging environment.

This includes the shared value program, which supports our teams in low- and middle-income countries to implement initiatives that **address health system barriers** to patient access through capacity building and training for healthcare professionals. For example, a team in Argentina carried out a series of activities to raise awareness and train healthcare professionals on the importance of early detection and treatment of growth hormone deficiency in children, reaching 300 pediatricians in rural areas of the country. By the end of 2023 our shared value initiatives had reached around 54 million people via screening and awareness and trained around 20,000 healthcare professionals.

Our **collaborations in Africa** to establish robust supply chains are also crucial for ensuring safe, effective and continuous healthcare delivery. Our Access Mentorship program, through which expert volunteers from our Global Supply Network Organization share knowledge with local African distributors, demonstrates our commitment to improving supply chain operations and increasing access to healthcare.

In 2023, a Startup competition resulted in the launch of collaborations in Indonesia and the Philippines. The objective is to support local health systems in strengthening and accessing pilot initiatives around non-communicable diseases (e.g. thyroid disorders).

We also upgraded an evaluation tool to track the impact of our access programs on patients, healthcare providers and health systems. This tool serves to monitor our progress over time and continue integrating recommendations from the Access to Medicine Index into our strategy.

Eliminating schistosomiasis: Four pillars

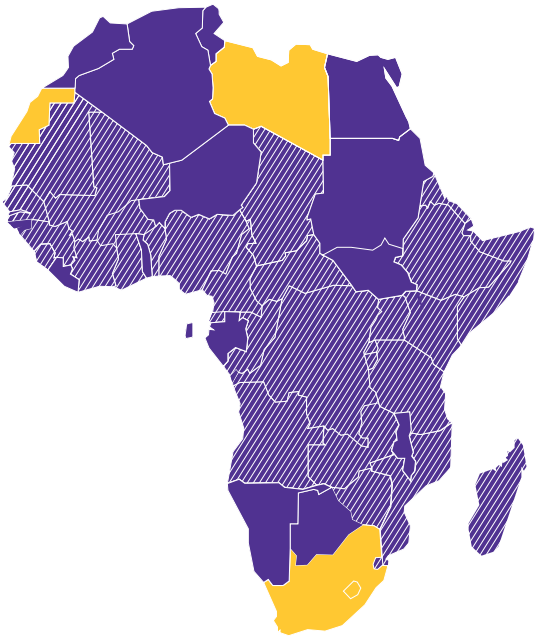
To support the elimination of schistosomiasis as a public health problem, we have adopted an integrated approach based on four pillars: treatment, research & development, behavioral change, and advocacy & partnerships.

Treatment

As part of our long-standing partnership with WHO, we are committed to producing and donating up to 250 million praziquantel tablets every year. This initiative is a major part of our integrated and coordinated approach to treating and eliminating schistosomiasis as a public health problem. Since 2007, we have donated around **2 billion tablets** to WHO to combat this disease. They have been **distributed in 47 endemic African countries**, primarily to treat school-aged children. In 2023, we donated over 210 million tablets for distribution in 37 countries, 29 of which are in sub-Saharan Africa.

Countries that have received donations of praziquantel tablets

Since 2007, we have donated **2 billion** tablets of praziquantel, which is enough to treat around 800 million school-aged children.



- African countries that have been receiving tablet donations from us since 2007*.
- African countries to which we also donated tablets in 2023.
- Countries that have received no donated tablets to date.

* Launch of our Praziquantel Donation Program.

To improve transparency of the supply chain for NTD medicine donations, including praziquantel, we use NTDeliver, a digital supply chain management tool. We work with multiple partners to optimize efficiencies and timelines from the manufacturing site to the national warehouse, and from there to the delivery of treatments. In Kenya, a tailored last-mile tracking system is now being used to capture real-time data up to the distribution level, reporting the number of tablets used and any remaining stock. In 2023, this digital system was rolled out in 13 Kenyan counties.

Research and development

In partnership with the **Pediatric Praziquantel Consortium**, we have developed **arpraziquantel as a new treatment** option for children aged three months to six years infected with schistosomiasis. In December 2023, **arpraziquantel received a positive scientific opinion** from the Committee for Medicinal Products for Human Use (CHMP), part of the European Medicines Agency (EMA). EMA assessed arpraziquantel under the “EU-M4all” procedure for high-priority medicines intended for markets outside of the European Union. This positive result facilitates arpraziquantel’s inclusion in the WHO List of Prequalified Medicinal Products. Prequalification will also help to support regulatory pathways in African countries. In Brazil, regulatory submission is planned by the consortium partner Farmanguinhos, the public pharmaceutical laboratory of the Fiocruz Foundation. Within the consortium, the implementation research program (ADOPT) is underway to prepare for the introduction of

arpraziquantel in schistosomiasis-endemic communities. New procurement and funding mechanisms for equitable and sustainable access to the medicine – to be made available on an at-cost basis – are being collaboratively explored.

On the research side, pre-clinical tests were conducted on a promising candidate to prevent and cure schistosomiasis as part of our efforts to develop a new generation of the drug.

To support drug discovery and development, we have introduced innovative artificial intelligence and epidemiology modeling. We have also started developing new technologies to diagnose schistosomiasis, including **female genital schistosomiasis**.

There is still a critical need for more **sensitive diagnostics** to detect cases in low-endemicity settings. They can help to effectively manage and surveil schistosomiasis while forming tools to eliminate the disease. Therefore, we are continuing our collaboration with the Foundation for Innovative New Diagnostics (**FIND**) and a consortium of partners to develop a sensitive rapid diagnostic test to improve schistosomiasis mapping and case detection.

Our R&D programs integrate and invest in scientific, educational and training initiatives to enhance expertise and capacity in low- and middle-income countries. More information can be found under **Building health capacity and awareness**.

Behavioral Change

Our health education project with the **NALA** (Neglected Tropical Disease Advocacy, Learning, Action) Foundation focuses on southwestern Ethiopia. It includes WASH activities and aims to promote long-term behavioral change via a community-based approach to eliminate schistosomiasis and other neglected tropical diseases. In 2023, the main emphasis of the project was its handover to the local government. The aim was to ensure the government could integrate the program’s disease-prevention initiatives into its processes and activities, sustaining and expanding the project’s outcomes. Operational research comparing two districts was conducted to evaluate the effectiveness of behavioral change combined with mass drug administration versus mass drug administration alone. The results showed a **greater reduction in the prevalence** of schistosomiasis in the intervention district, strongly suggesting a positive correlation between integrated interventions and changed behavior in these communities.

In 2023, we implemented our collaborative access to water program in partnership with World Vision in Ghana to improve WASH in communities, to combat infectious diseases such as schistosomiasis. This initiative has increased access to clean water for targeted households, health facilities and schools, reaching over 22,000 people. In 2023, the involved communities in Ghana showed a significant reduction (65-78%) in the number of cases of waterborne diseases, including schistosomiasis.

More information can be found under **Building health capacity and awareness**.

Advocacy and partnerships

We work with international and local partners to advance schistosomiasis control and elimination. We continue to support the Global Schistosomiasis Alliance (**GSA**), a coordinated, multi-sectoral effort to combat the complex disease. The GSA’s role as a central platform for all schistosomiasis matters has grown considerably over the past few years. In 2023, the GSA organized various meetings about schistosomiasis, including a full-day stakeholder event entitled “Celebrating recent achievements supporting elimination goals”.

Malaria: Treatment and prevention

Developing therapeutic solutions

As part of our **As One Against Malaria program**, we are developing a new drug called cabamiquine. It has 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**, and we published the results in peer-reviewed scientific journals. In 2023, the program progressed to clinical Phase II with the implementation of two cabamiquine combination studies for cure and prevention. Preclinical research and new technologies, including a **new 3D culture-based hepatic platform** used to investigate the activity of our drug candidate, have supported the clinical development program.

In the course of 2023, our drug discovery platform generated an additional promising antimalarial candidate in early preclinical development.

Preventing and controlling malaria transmission

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**.

The laboratory tests conducted in Ghana evaluated the efficacy of a new formulation of IR3535® for longer-lasting protection. Based on the positive results, an additional field test was carried out to determine how IR3535® performs in real-world settings. The study indicated long-term efficacy and protection against anopheles bites in malaria-endemic areas.

In partnership with local institutions in Africa, we have established PAVON, the Pan-African Vivax and Ovale Network. It is a network of centers of excellence that support malaria elimination through the epidemiology of the parasites P. Vivax and P. Ovale and capacity building in Africa. In over ten African countries, PAVON supports policymaking, accelerates the development and uptake of new therapeutics and provides training to African scientists.

Engaging stakeholders

Partnerships and dialogue are critical to addressing global health challenges and improving access to healthcare. Our partners include multinational organizations, governmental agencies and NGOs, as well as academic institutions, health industry associations, private companies, and independent global health experts.

In 2023, we continued engaging with our partners and key stakeholders, including **WHO**, to advance global health discussions and address shared challenges. We are collaborating with partners such as the **END Fund** and **DNDi**, as well as with academia in African countries. We have engaged in consortia with partners, such as the **Pediatric Praziquantel Consortium**; alliances, such as the Swiss Alliance for Neglected Tropical Diseases; and advocacy groups, including the **Uniting to Combat NTDs** and **GSA**. In addition, we are working closely with foundations, such as the **Bill & Melinda Gates Foundation** and the **Access to Medicine Foundation**, that promote scientific research and health access. We have also joined forces with funders, such as the Global Health Innovative Technology Fund (**GHIT**) and the European and Developing Countries Clinical Trials Partnership (**EDCTP**).

We also strengthen our **collaborations with the scientific and global health community** through publications, patent sharing and taking active roles at international events. On several occasions, we presented the progress of the Pediatric Praziquantel Consortium program we lead, including at the Global NTDs Meeting (prior to G7), the EDCTP Forum and the SACRA conference. We also attended the Annual NTD NGO Network and the Coalition for Operational Research on Neglected Tropical Diseases (**COR-NTD**) in 2023 to address the spread of misinformation about NTDs.

Open innovation sharing

We have a responsibility to improve global access to health through our scientific and technological advances. We support a reliable and transparent legal framework for intellectual property that enables sustainable investment in research and development.

Our approach to sharing and protecting intellectual property

The responsible treatment of intellectual property is not a barrier to health, but rather ensures the **safety and high quality** of medicines for patients worldwide. Almost none of the medicines that address the highest burden of disease in low- and middle-income countries are protected by patents. Studies indicate that between 90% and 95% of the pharmaceutical products on the **WHO Model List of Essential Medicines** are off-patent.

We support a sustainable **approach to intellectual property** that drives innovation and enables access to health. We **refrain from enforcing patents** in a majority of low- and middle-income countries. In markets where we do register product patents, we are transparent and committed to sharing data to the greatest possible extent and improving public access to clinical study data. We report on the patent status of our products via the publicly accessible database **Pat-INFORMED**. Additionally, we support voluntary licensing agreements, including non-exclusive voluntary licenses, legally binding non-assertion covenants and clauses that aim to broaden access to health. We also support the concept of patent pools and believe they should be structured to improve access to medicines, prevent anti-competitive behavior and overcome geographic limitations.

Through our **open innovation research projects** for global health, we grant access to small sections of our chemical compound libraries. In doing so, we aim to accelerate collaborative research programs that develop novel R&D platforms in search of new active ingredients for infectious diseases.

Roles and responsibilities

Our Open Innovation initiatives are collaborative and cross-functional efforts that facilitate the exchange of intellectual property. We aim to accelerate early discovery in diseases with high unmet needs through intellectual property sharing. We hope to foster the discovery of new generations of health solutions that will address the needs of the most vulnerable populations, with a primary focus on the neglected tropical disease schistosomiasis and on malaria.

Our commitment: Supporting transparent and reliable frameworks

We support **TRIPS**, an international agreement administered by the World Trade Organization (WTO). It addresses trade-related aspects of intellectual property rights as well as TRIPS addenda, such as the Special Declaration on the TRIPS Agreement and Public Health. This agreement extended the deadline for the least developed countries to apply TRIPS provisions to pharmaceutical patents by 2033.

Improving access to patent information

We are a founding member of the Patent Information Initiative for Medicines (**Pat-INFORMED**), a global gateway to medicine patent information. Pat-INFORMED features patent information on small-molecule drugs for cardiovascular diseases, diabetes, hepatitis C, HIV, cancer, and respiratory disorders. It also covers products on **the WHO Model List of Essential Medicines** that are not within these therapeutic areas.

Creating research opportunities

We are committed to accelerating innovation and advancing science for the benefit of the most neglected populations. That is why we catalyze research in the spirit of open innovation and with the intention of reducing financial barriers. For example, through our **Schistosomiasis Research Grant Initiative**, which we launched in 2021, we awarded 15 research projects € 30,000 each in the past years. Most of the progress reports from these projects were made available by the end of 2023 and have so far resulted in four publications and additional funding for other organizations.

In addition, our **Open Global Health Library** shares 250 compounds from our proprietary chemical library that may be used for infectious diseases research. Since its launch in 2020, the library has been accessed 24 times for screening in 17 indications.

We are also collaborating with the **Drugs for Neglected Diseases initiative** (DNDi) and, through the memorandum of understanding with DNDi and the Swiss Tropical and Public Health Institute, continuing our dialogue for research in the field of **schistosomiasis**.

More information on our collaborations regarding open innovation for global health can be found on our **website**.

Prices of medicines

In 2022, pharmaceutical spending accounted for **between 6% and 31%** of total health spending by OECD countries. At the same time, advances in the research and development of innovative medicines are significantly transforming the healthcare landscape, enabling chronic diseases – the greatest cost drivers – to be treated more effectively and affordably.

Our approach to pricing medicines

The prices of our products reflect the value they deliver to patients as well as broader society. We price our products responsibly and work to prevent costs from becoming a barrier to treatment. In doing so, we strive to deliver on our steadfast commitment to providing **the broadest possible patient access**. We also continue to invest in meaningful scientific innovation to address the high number of unmet medical needs still faced by many patients and their caregivers. Therefore, we adapt the prices of our medicines in different geographic and socioeconomic segments according to people's ability to pay.

We acknowledge the affordability challenges many healthcare systems face amid growing financial pressures. We recognize the unique characteristics of each health system and adapt our pricing based on local market considerations, including unmet medical and treatment needs, health system capacity, infrastructure, socioeconomic standards as well as affordability within the respective healthcare system and the ability of patients to pay. We apply intra-country and inter-country equitable pricing approaches to all our brands.

This approach involves working closely with governments and other stakeholders. In addition, we continuously monitor dynamic healthcare environments and markets, pricing and reimbursement systems as well as legal and regulatory guidelines, adjusting our prices as necessary. We conduct annual price analyses to validate price thresholds and provide guidance on local pricing to our subsidiaries for the following year. We aim to ensure that they meet patient access needs by taking a **consistent, data-driven approach**.

To increase the availability, accessibility and affordability of our medicines in Africa, Asia, Latin America, and the Middle East, we have adopted a **new systematic approach known as the** SHAPE program. This will enable us to address these access barriers for underserved patient populations in low- and middle-income countries.

Additionally, we support innovative risk-sharing agreements and are working to improve data efficiency in health systems to help distribute funds and resources more optimally.

Roles and responsibilities

Our Global Value Demonstration, Market Access & Pricing (GVAP) unit, formerly called GMAP, reporting directly to a member of our Healthcare Executive Committee, evaluates market launch prices in coordination with the respective franchises. In addition, the GVAP unit systematically evaluates our medicine portfolios and applies equal access initiatives to them. Our local affiliates are responsible for managing prices and adapting them to evolving local conditions in compliance with our pricing governance and the defined price approval process.

Our commitment: Medicine price guidelines and principles

The affordability of our health solutions is part of our broader patient value proposition. Our medicine pricing adheres to the stipulations of our overarching **Charter on Access to Health in Developing Countries** and is defined in detail in an internal guideline. Additionally, our Patient Access Programs Policy sets out standards for offering medicines at affordable prices.

Value-based contracting models

We are committed to advancing value-based healthcare through pricing and contracting mechanisms that comply with applicable local laws and regulations. In collaboration with payers, such as health insurance companies, we have developed various product- and market-specific reimbursement and contracting models. These help to provide patients with prompt **access to our innovations**.

In 2023, we continued to implement and maintain innovative risk-sharing agreements (RSAs) that provide immediate access to Mavenclad® for patients with multiple sclerosis (MS). We broadened access to this medicine through specific agreements in eligible countries across Europe, Latin America and the Middle East including Argentina, Hungary, Kuwait, South Africa and the United Arab Emirates.

SHAPE program for low- and middle-income countries

We have set **ambitious goals** for our SHAPE program to **improve access to our medicines** for underserved patient populations in low- and middle-income countries. The program covers both existing and upcoming products, focusing on therapeutic areas such as head and neck, colorectal and bladder cancers as well as thyroid disorders.

More specifically, to enable greater access to our medicines in low- and middle-income countries, we have adopted a three-pronged approach that goes deeper, wider and faster. We are going deeper in our collaborative efforts to remove access barriers in individual countries, including launching equitable pricing strategies and health system strengthening initiatives. We are going wider by making our medicines available in more countries, focusing on those with significant prevalence. And lastly, we are going faster when introducing new products to low- and middle-income countries, **reducing the time** between the first global launch and regulatory filings in those countries.

In 2023 we served **more than 57 million patients** in low- and middle-income countries with our healthcare portfolio. Boosted by our SHAPE program, we aim to **reach 80 million patients per year by 2030**. As of 2023, 15 pilots have been initiated in countries such as Argentina, Brazil, Egypt, Indonesia, and Mexico as well as several countries of Central America.

Strategic tender activities

Tenders constitute a significant percentage of our global sales and are a crucial growth driver for our established portfolio. We participate in government tenders for products used in public hospitals serving low-income patients, often in low- and middle-income countries.

High-quality, affordable second brands

For some of our existing high-quality products, we offer second brands at affordable prices, particularly in countries with a large percentage of low-income patients. For example, second brands for the betablocker bisoprolol (Concor®) are available at affordable prices in Brazil, Chile, Peru, Poland, and South Africa. The same applies to levothyroxine (Euthyrox®) in Brazil and Mexico, and to metformin (extended release, Glucophage® and Glucophage XR®) in Mexico.

Patient access programs

Patient access programs (PAPs) are **self-sustaining commercial programs** that provide registered medicinal products for underserved populations. They primarily seek to address affordability challenges. We operate PAPs in several countries. Some representative examples are shown here.

In India, we offer a program for our oncology drug Erbitux® that provides financial assistance to eligible underprivileged patients in line with local laws and regulations. Since we initiated the program in 2013, it has been made available to over 7,000 patients nationally. In 2023, approximately 1,200 patients benefited from the program.

In Indonesia, we started implementing an oncology access initiative featuring PAPs and affordable pricing for low- and middle-income patient groups. This initiative supported approximately 100 patients in 2022 and over 400 patients in 2023.

In Egypt, under the presidential initiative for early detection of cancers, we launched a nationwide equitable access program for Erbitux®. In support, we signed a Memorandum of Understanding in September 2023. The program aims to reduce the prevalence and mortality rates of colorectal cancers by increasing public awareness, providing continuous medical education for healthcare practitioners and supporting diagnosis and treatment.

In Peru, we worked closely with local authorities in 2023 to initiate a new project aimed at increasing hypothyroidism diagnosis in Lima and its surrounding suburbs.

Building health capacity & awareness

We believe that in order to make tomorrow's world a healthier place for everyone, it is essential to help health professionals and patients make informed decisions about treatment paths. This support includes building health capacity as well as awareness. As a prerequisite, health systems need to be strong and benefit from solid collaborations to build resilience against crises and emergencies.

Our approach to building health capacity and awareness

Capacity-building and awareness-building play key roles in our approach to improving **access to health**. We empower patients, communities, scientists, and healthcare professionals by providing appropriate tools, skills and information so that they can make **informed decisions** about prevention, diagnosis, treatment, care, and disease management.

The private sector is a crucial partner in responding to global health threats. Beyond developing innovative health solutions and applying adapted mechanisms for access to medicines, we support countries in building up infrastructure and expertise for preparedness of local health systems to deliver care to all patients in need and address emergencies effectively. That is why we invest to strengthen the prevention, preparedness and resilience capabilities of health systems in low- and middle-income countries. Our efforts include the following aspects:

- **Increasing country preparedness** by enhancing scientific and healthcare workforce competencies and capacities through a network of experts.
- **Forming partnerships** to extend disease awareness and address the challenge of enabling consistent access to medicines for all patients in need.
- **Optimizing the monitoring and evaluation** of health initiatives at country level through data processing and digitalization.

We operationalize these elements along the entire value chain in our collaborative programs and through our health education initiatives with our local partners.

We also collaborate with committed global partners to conduct educational campaigns for prevention, early diagnosis and awareness. We focus primarily on the diseases for which we have the greatest expertise. Our activities include specific initiatives that promote awareness for **carers** as well as **women's health and economic empowerment** to expand their access to health.

Roles and responsibilities

Our Global Health organization leads collaborative capacity strengthening and awareness initiatives in low- and middle-income countries to support our mission of improving the health of the most vulnerable populations.

Beyond this, our awareness initiatives are individually planned by our various businesses and aligned with the global strategic direction of the Group. They are implemented on global and/or local levels and organized according to the **specific needs of the relevant community**. Our subsidiaries are also responsible for locally mobilizing our global campaigns.

Our commitment: access to health through awareness and education

Our strategy for addressing access to health incorporates the topic of awareness and education as detailed in our **Charter on Access to Health in Developing Countries**. Our campaigns and initiatives are also subject to the respective marketing principles set out in guidelines such as our Pharma Code for Conducting Pharmaceutical Business and Pharmaceutical Operations. In addition, our campaigns are governed by internal policies that guide our **interactions with health systems** and by communication material review processes that ensure we comply with global, regional and national rules and regulations.

Working with partners to achieve more

Our Global Health portfolio consists of collaborative initiatives that aim to strengthen the capacity and effectiveness of health systems in low- and middle-income countries. We support work in these four key areas:

Local research and development

We build scientific capacity through our **R&D programs** and focus primarily on **schistosomiasis** and also include malaria. Some examples include:

- Clinical trials in African health centers to investigate **arpraziquantel** as a potential new treatment option for pre-school children infected with schistosomiasis. These trials have enabled local healthcare professionals to acquire valuable experience in **Good Clinical Practice**, which they can apply in other studies.
- Our partnership with the **University of Cape Town for malaria drug discovery** activities that transfer scientific expertise and support the employment and training of talented local young scientists.
- **PAVON** (Pan-African Vivax and Ovale Network), a network of centers for excellence in over ten African countries. It offers training to African scientists in a collective effort to build capacity and expertise to treat all forms of malaria.

Manufacturing and supply chains

We manufacture some of our products directly in the regions where they are needed. We also strengthen local manufacturing and supply chain capacities through **technology and best practice** transfers. Our aim is to increase service quality while ensuring safe, effective and reliable access to quality medicines where they are needed most.

- We produce praziquantel, the standard-of-care treatment for schistosomiasis, in our production facility in Mexico. This enables the provision of up to 250 million tablets per year to treat the disease, mainly in school-age children.
- We apply a local production approach in our work with the **Pediatric Praziquantel Consortium** to help countries become self-sufficient and serve local populations in need. We are partnering with Universal, a contract manufacturer in Kenya, to prepare for the large-scale production of arpraziquantel upon its approval, in addition to the production by Farmaguinhos in Brazil.
- We partner with Business for Health Solutions (**BHS**) to build sustainable supply chains of local distributors in Africa through our **Access Delivery Mentorship program**. Since the start of the collaboration in 2019, we have supported a total of seven distributors in five countries.

Education and awareness raising

We invest in **education and behavioral change initiatives** that raise disease awareness. Examples of those initiatives include:

- In Ethiopia, we operate a joint health education and WASH project in partnership with the **NALA Foundation** and the Ethiopian Ministry of Health. We reached around 230,000 community members and more than 370,000 school-age children in districts with the highest prevalence of schistosomiasis. More information about the project can be found under **Global Health**.
- To support behavioral change for **schistosomiasis** elimination, we introduced the **Bilharzia Storytelling Lab** **in 2022**. The lab brings together storytellers, health experts and community leaders from one country to develop creative communication products that provide accessible and tailored disease information to risk groups. We award the most promising solution with a € 10,000 prize. We intend to apply the concept in several **endemic countries** in sub-Saharan Africa. In 2023, the winning team from Rwanda successfully piloted its solution in three schools. We are preparing a third lab for 2024.

Health infrastructure and training

We are **building infrastructure, strengthening health systems and supporting training** in low- and middle-income countries.

In 2023, our achievements included:

- Continuing our support for the availability of microscopes and training sessions in **Ghana, Burkina Faso and Botswana** to improve local health workers' ability to detect malaria and other diseases that can be diagnosed via blood samples. In 2023, we also prepared to extend this initiative in Nigeria and Kenya.
- Completing our collaborative **access to water program in Ghana**. It improves healthcare infrastructure through safe water services in health centers and provides training to health workers on schistosomiasis case management.
- Partnering with the H3D Foundation at the University of Cape Town and launching a virtual, free-of-charge drug discovery and development course. It primarily targets students and scientists in low- and middle-income countries.
- Integrating the **Thyromobile project in the Philippines** as part of our access initiatives to strengthen health systems in low- and middle-income countries. The mobile unit brings essential equipment and personnel to specific communities to provide public information and healthcare services to patients with thyroid disorders. Since its launch in May 2023, the Thyromobile has covered 15 provinces in the Philippines with high incidence rates of thyroid disorders.

More information can be found under **Global Health**.

Global awareness campaigns

We regularly conduct campaigns to raise awareness of various diseases across the globe, often in collaboration with patient advocacy and carer groups. We focus on diseases that are aligned with **our core competencies**, expertise and experience along the health value chain. These diseases include cancer (specifically colorectal cancer, head and neck cancer and bladder cancer), thyroid disorders, diabetes, infertility, and multiple sclerosis. Throughout the year, we also conduct awareness campaigns that focus on tropical diseases, such as schistosomiasis and malaria.

January 30: World NTD Day
World **NTD** Day brings together civil society advocates, community leaders, global health experts, and policymakers who collaborate across disciplines to control and eliminate neglected tropical diseases.

February 4: World Cancer Day
February 4 marks **World Cancer Day**, an annual initiative led by the Union for International Cancer Control (UICC). It aims to raise cancer awareness and improve its prevention, detection and treatment. In 2023, the theme was again “Close the care gap”.

April 7: World Health Day
World Health Day raises awareness about a specific health theme each year to highlight a priority area of concern for the World Health Organization. In 2023, the theme was “Health for all”.

April 25: World Malaria Day
World Malaria Day highlights the need for continued investment in and sustained political commitment to malaria prevention and control.

May 25-31: Thyroid Awareness Week
In collaboration with the Thyroid Federation International (**TFI**), the annual awareness campaign, which used the slogan “**Know Your Past and Understand Your Future**” in 2023, to inform that genetics may strongly influence the risk of developing thyroid disorders.

May 30: World Multiple Sclerosis Day
World Multiple Sclerosis Day is an annual awareness day by the MS International Federation (**MSIF**). It brings the global MS community together to share stories, raise awareness and campaign with everyone affected by multiple sclerosis. In 2023, it focused on again on ”connections”.

July 27: World Head And Neck Cancer Day
World Head and Neck Cancer Day is an opportunity to inform the general public about head and neck cancer and recognize the impact it has on those affected in the community.

August 1: World Lung Cancer Day
The Forum of International Respiratory Societies has observed World Lung Cancer Day every year since 2012 to raise awareness about the risk factors of the disease.

September 17: Patient Safety Day
We celebrate **Patient Safety Day** via our affiliates worldwide to raise awareness about this vital topic. In 2023, we organized various online and on-site events with affiliates in all continents and jointly celebrated Patient Safety Day with other companies in India and Kenya.

September 29: World Heart Day
World Heart Day was established by the World Heart Federation and increases awareness about cardiovascular diseases and how to control them to negate their global impact.

November 1-7: European Fertility Week
European Fertility Week raises awareness about infertility and conveys the issues faced by people with infertility. It also aims to remove the stigma around infertility and highlight the issue of unequal access to treatment in Europe.

November 14: World Diabetes Day
World Diabetes Day was created in response to growing concerns about the escalating health threat posed by diabetes. The aim of the 2023 campaign, the theme of which was “Show Type 2 Diabetes the Red Card”, was to keep diabetes in both the public and political spotlight.

Purpose-driven initiatives

Healthy Women, Healthy Economies and **Embracing Carers®** are two initiatives we are using to promote awareness of public health issues extending beyond patients. The interconnectedness of both initiatives is rooted in shared themes and goals. The majority of unpaid and underpaid caregiving hours globally are provided by women and girls. Through these initiatives, we aim to both promote and support women's health and economic empowerment and expand access to health.

Healthy Women, Healthy Economies

To empower women to overcome the challenges of communicable and non-communicable diseases and reach their economic potential, we are committed to the **Healthy Women, Healthy Economies** initiative – a public-private partnership founded within the Asia-Pacific Economic Cooperation (**APEC**).

The APEC Healthy Women, Healthy Economies **Research Prize**, which we support, has highlighted sex-disaggregated research that enables policymakers, business leaders and other stakeholders to identify and implement measures that improve women's health in APEC economies. In 2023, the US$ 20,000 prize was awarded to Dr. Jason Junjie Huang, the Deputy Director and Research Assistant Professor at the Centre for Health Education and Health Promotion at the Chinese University of Hong Kong). His study investigated the global burden of endometrial cancer and its risk factors, primarily lifestyle choices such as smoking and alcohol consumption.

Embracing Carers

Embracing Carers® is our global initiative led in collaboration with prominent caregiving organizations from around the world. Embracing Carers is designed to increase awareness, action and discussion around the frequently overlooked needs of unpaid caregivers.

In 2023, Embracing Carers collaborated with the United Nations-Guided Global Initiative on Ageing (GIA) to provide a **training course** on critical skills for family caregivers. The five-module course offers professional instruction and guidance on vital caregiving topics such as using medical equipment, creating safe environments and overcoming communication barriers.

Product safety & quality

Chemical product safety

Many of our chemical products have intrinsic hazardous properties. Therefore, we are working to minimize the potential risks to both human health and the environment that arise from their use. We continuously strive to improve the safety of our products and reduce the environmental impact of our businesses through innovative solutions and digital communication tools.

Our approach to safe chemical products

Product safety is one of our top priorities. During the product development phase, we investigate the potential adverse impacts of chemical substances. Along the entire value chain of our products **– from raw materials to manufacture and commercialization** – we provide relevant information on their hazardous properties and how to deal with them. These instructions facilitate the safe handling and use of our products in line with pertinent regulatory requirements. We publish this information primarily on the relevant digital channels. As paper safety data sheets are still common in some countries, we can also provide these upon request through our customer service.

We support the implementation of the **European Green Deal** and are preparing to integrate the relevant chemicals sustainability aspects into our business strategies.

An important topic arising from the European Green Deal is the universal PFAS (per- and polyfluoroalkyl substances) restriction proposal submitted in January 2023 by five national authorities to the European Chemicals Agency. Products based on PFAS play an essential role in our three business sectors (Life Science, Healthcare and Electronics) and are valuable to society in various ways. For example, they enable the manufacture of products and services that address medical needs, accelerate drug development and manufacturing, aid the discovery of new treatments for challenging diseases, and enable more intelligent electronic devices. However, very persistent PFAS may lead to adverse effects for the environment and humans. We therefore support the search for substitutes for PFAS and conduct active research ourselves. As part of our mission to advance human progress, we fully support the ambition for smart and targeted PFAS regulations. We are actively searching for PFAS substitutes and conducting research into viable alternatives.

Roles and responsibilities

Our Life Science, Healthcare and Electronics business sectors have organizational structures in place to implement our product safety strategy in line with their **respective business requirements and customer needs**. This approach includes registering chemicals, classifying hazardous substances and highlighting risks using safety data sheets, labels and digital communication tools.

Our **Group standard** provides a framework for governing the setup of effective operational processes for product safety, hazard communication and chemical regulatory compliance throughout our business sectors. In addition, the Group Chemicals Regulations Council fosters cross-sectoral alignment of strategic regulatory activities required for existing and emerging chemicals regulations as well as sustainability and identifies potential impacts for our company.

This approach also applies to innovative fields of development such as nanomaterials, which we use with the greatest of care in line with the precautionary principle. Furthermore, our Group-wide **Policy for Use and Handling of Nanomaterials** provides the necessary guidance on the use of these materials.

Legal requirements and internal guidelines

Our internal standard defines the roles, responsibilities and basic processes required to comply with national and international regulations. In addition, we have also endorsed **voluntary commitments** of the chemical industry such as the **Responsible Care® Global Charter**.

The legal requirements relevant to compliance with chemicals regulations are mainly related to hazard communication as well as local and regional chemical registration activities. These requirements are expanding globally, with a growing number of countries adapting their local rules in line with existing regulatory frameworks such as **REACH**. Our organizational setup enables us to comply with regulations of this kind in important markets, such as China, India, Japan, Korea, and Taiwan. Using the **Globally Harmonized System** for Classification and Labelling of Chemicals (GHS) for hazard communication enables us to streamline our internal processes and provide consistent, harmonized and high-quality information to our customers.

Our **worldwide network of regulatory experts** in all three business sectors continuously monitors changes to legal requirements and scientific developments to stay abreast of trends and best practices.

In 2023, there was one incident of non-compliance with regulations concerning potential health and safety impacts and the labeling of our chemical products. Some information and the REACH registration number was missing on a safety data sheet which resulted in a fine in Italy. In this regard, to the best of our knowledge, there were no negative impacts on human health or the environment.

Safety analysis of our products

Safe and sustainable by design implies that product safety starts during development. Therefore, at an early stage of our **product development process**, we analyze innovations in terms of their impacts on human health and the environment. We continuously evaluate the intrinsic hazards of both our existing and new products to create relevant product safety information in line with applicable rules.

Product safety information

Chemical product safety is all about protecting human health and the environment from adverse impacts resulting from the use of chemical products throughout their life cycle. To achieve this, we provide **relevant information** to our customers and the public, which helps to raise awareness of the hazards and build a greater understanding of how to mitigate risks and use the products safely.

To obtain the relevant information on hazard profiles, we employ industry-standard **digital tools** through which we gather information available on the substances we use. We then cross-reference this data with local and regional rules to establish the relevant hazard classifications. We publish this information digitally on **country-specific safety data sheets** in multiple languages and on the labels of our products. The data sheets are maintained electronically and updated if there are relevant changes. We have automated and standardized most of our hazard communication processes.

For products with little available information, we are investigating the feasibility of using alternative predictive **non-animal testing methods**, such as **read-across** and (Q)SAR. In 2023, we successfully used (Q)SAR and read-across-derived data to register products under the Act on the Registration and Evaluation of Chemicals in

Korea (known as “Korea REACH”). For third-party products, we expect robust product safety documentation from our suppliers, which we feed into our processes or share directly with our customers.

Helping customers access safety information

Our Life Science customers and all interested stakeholders can access product safety information in their respective language and according to country-specific regulations through a dedicated **mobile app called My M Safety** (**Android** and **iOS**). Customers can retrieve this information by scanning a barcode on the product label or entering identifiers such as material numbers, names or CAS numbers.

Through our **ScIDeEx™** web tool, anyone can check whether using a particular chemical is safe within the boundaries specified in the EU REACH exposure scenarios. ScIDeEx™ is based on a full implementation of the **ECETOC TRA 3** model for human exposure assessments in industrial and professional settings.

Project M-SPOT: Our Sustainable Portfolio Transformation

In July 2023, we started to apply a portfolio sustainability assessment approach based on the industry standard of the **World Business Council for Sustainable Development**. Initially, we started implementing it in our Life Science and Electronics business sectors. Our Healthcare business sector will be included in the framework in 2024. Using M-SPOT, we are systematically developing a baseline for the sustainability performance of our product portfolio. We will determine the ratio of our sales from the most relevant products within defined performance categories. This performance data will enable us to set corporate, sector and business segment sustainability targets for strategic portfolio steering.

Patient safety

The safety of patients treated with our medicines is our top priority. Our medicinal products must be effective in treating the respective disease while posing the lowest possible risk to patients. That is why we aim to continuously monitor any risks or adverse effects that may arise and take the necessary actions to minimize them.

Our approach to ensuring patient safety

Through a rigorous benefit-risk management process, we help to ensure that the benefits of our medicinal products always outweigh the risks for patients. Every new medicine goes through a series of precisely defined development stages. Before any medicinal product is administered to human subjects, we conduct extensive preclinical testing both in vitro and in vivo. Through toxicological testing, we determine whether an active pharmaceutical ingredient is toxic to living organisms and, if so, at which dosage. This testing also helps us determine the dose that humans can safely tolerate. Only when this is complete do we perform human **clinical studies** to investigate the safety and efficacy of the medicinal product. During clinical development, we diligently use all the collected data to continuously evaluate the medicinal product's **benefit-risk profile**. If we consider the medicinal product's benefit-risk profile to be positive, we then submit an application for marketing authorization to the relevant regulatory authorities.

Continual monitoring of product safety risk profiles

Once we launch a new medicinal product, the number of patients being treated with the product increases significantly. In rare circumstances, there may be adverse and potentially serious effects that were not detected during clinical development, which is why we continuously monitor risks and assess the benefit-risk profiles of the products after their market launch. Pharmacovigilance includes the process of monitoring a medicinal product on an ongoing basis to detect and assess safety signals as part of signal management activities. Our pharmacovigilance system and our pharmacovigilance business continuity management help to ensure continuous monitoring of adverse effects, allowing us to proactively and transparently minimize and communicate any risks. Emergency response procedures for business continuity are managed in accordance with global and local business continuity plans, tested in regular, defined intervals or with mock scenarios. In addition, we provide healthcare professionals and patients with the **latest information on the safety** of our marketed medicinal products. The scope of continuous safety monitoring covers the entire life cycle of a product, ranging from development, market launch and commercialization to the expiration or cancellation of its marketing authorization.

We continuously monitor our service objectives through our **pharmacovigilance quality strategy** and annual quality plan. We also regularly monitor our performance and compliance through the internal and external reporting of key performance indicators. These include making timely submissions of high-quality documents to health authorities, along with assessments to support the safety monitoring of products throughout their life cycles.

The capabilities we have developed and strengthened in this area include:

- Advanced benefit-risk management
- Safety data analytics in support of benefit-risk strategy implementation (taking into account and integrating real-world data)
- Advanced signal detection methodology
- Reporter-oriented methods for collecting adverse effects (such as via mobile app)
- Comprehensive evaluation of identified adverse effects by the company in the context of the products' known benefit-risk profiles and ensuring medicinal product information and labels reflect any relevant changes

Based on regulatory approval conditions for newly approved medicinal products, we develop and update educational materials for patients and healthcare providers in accordance with the requirement to communicate any known and potential risks and ways to minimize them. We assess the effectiveness of these materials in close collaboration with our **Benefit-Risk Action Team**. If required, we adjust the contents of the materials and their distribution and describe the results from the effectiveness analysis in our periodic safety reports and risk management plans. We then submit these to the relevant health authorities for evaluation and approval.

By 2025, we aim to deliver product specific safety and benefit-risk strategies to support the execution of all key priority programs in line with internal and external stakeholders' expectations. These strategies will enable us to understand in greater detail the benefit-risk profiles at each stage of product development and post-marketing. During the reporting year, we worked toward achieving this goal by providing high-level safety and benefit-risk contributions for development programs with priority in oncology, neurology and immunology. Our contributions include for example, safety planning where all safety issues are properly defined with their corresponding strategy. And additionally, ongoing or planned safety investigations are also structured along with risk minimization measures. Additionally, we supported new partnering and in-licensing opportunities with medical safety strategies and outputs and ensured professional contract management for exchanging safety data. We also worked to develop a better understanding of Global Patient Safety's tasks and interactions during early development. Our initiatives included the scope extension of the Benefit-Risk Action Team to early development phases, and the respective enhancement of the Benefit-Risk Strategy Document to enable early, evidence-based safety decisions.

Roles and responsibilities

Our Global Patient Safety unit is responsible for drug safety. It continuously collects **current safety data** from a wide variety of sources across the globe, including clinical studies, early access programs, spontaneous reports on adverse effects, patient support programs, and articles published in medical and scientific journals. Our vision is to embed a deep knowledge of safety into early decision-making as we evolve **to practice predictive safety**.

Our experts help to ensure that all information on the risks and adverse effects of our medical products are properly documented, tracked and reported to the respective health authorities in accordance with regulatory requirements. Our Global Patient Safety unit analyzes all data and reassesses the benefit-risk profile based on these data, where required. We then inform regulatory authorities, healthcare professionals and patients about new risks, additional risk mitigation measures and potential changes **in the benefit-risk profile**. We convey this information through stipulated regulatory reports, safety communications (as applicable) and corresponding product label updates.

Our **Healthcare Quality** unit processes quality complaints related to our products. Whenever quality defects could have an impact on patient safety or lead to adverse effects, Global Patient Safety becomes involved.

Our Global Patient Safety unit hosts a Pharmacovigilance Intelligence Council that focuses on changes in pharmacovigilance legislation and their impacts on our global and local pharmacovigilance systems. This council enables us to make strategic decisions and govern changes in pharmacovigilance requirements, which fosters our target to ensure continuous compliance with regulatory requirements.

Our Medical Safety and Ethics Board

Our Medical Safety and Ethics Board (MSEB) is the governance board that oversees the safety and benefit-risk assessments of our medicinal products throughout their clinical development and commercialization. This internal board is chaired by our Chief Medical Officer and comprises experienced physicians, scientists and experts from our company. Throughout a medicinal product's entire life cycle, the MSEB reviews and assesses important medical safety risks and benefit-risk issues and endorses appropriate **measures to minimize risks**, such as updates to product information. The MSEB also assess human-related bioethical matters as appropriate and is accountable for the use of our medicinal products in early and post-study access.

The cross-functional Benefit-Risk Action Team is responsible for signal management, benefit-risk assessment, risk management and all topics related to product safety and the benefit-risk profile of our medicinal products. Recommendations from the Benefit-Risk Action Team are endorsed by the Pharmacovigilance Advisory Board, chaired by the head of Global Patient Safety. Important issues may be submitted to the MSEB for final assessment and endorsement.

Our commitment: Guidelines and statutory requirements

We rigorously aim to follow international guidance and standard procedures. These include the International Council for Harmonisation (**ICH**) guidelines, the Good Pharmacovigilance Practices (GVP) established by the European Medicines Agency (**EMA**), Title 21 of the Code of Federal Regulations governed by the U.S. Food and Drug Administration (FDA), and other pharmacovigilance regulations issued by national health authorities. We also aim to comply with relevant new statutory pharmacovigilance regulations in the countries where we market our products.

Inspections and audits for drug safety monitoring

Regulatory authorities conduct periodic inspections to verify that we comply with statutory requirements as well as our own internal pharmacovigilance standards. We follow up on the findings of health authority inspections and take necessary actions to ensure the ongoing compliance of our pharmacovigilance system. In 2023, we had five pharmacovigilance inspections (2022: four).

We also perform audits to our systems and processes to ensure that all our units and subsidiaries involved in pharmacovigilance consistently meet all global requirements. In 2023, we conducted a total of seven pharmacovigilance audits (2022: 19) and found no significant deviations in our pharmacovigilance systems from these requirements and standards. We also conducted twelve external audits at our vendors and licensing partners involved in pharmacovigilance, helping us to improve our pharmacovigilance processes and to comply with regulatory requirements.

Applying our proactive safety strategy to benefit-risk assessments

Regarding product safety risk assessments, we have successfully implemented in the past years an improved benefit-risk management strategy to become a more proactive and benefit-risk-focused organization. This strategy firmly establishes the concepts and principles for conducting benefit-risk assessments at each stage of product development and post-marketing. In addition, our Benefit-Risk Action Team co-leadership model, created in 2022, enables us to understand in even greater detail the benefit-risk profiles of our products and

enable early decision-making within our organization to protect patient safety. Ultimately, we aim to provide **the right medicine to the right patient at the right time**.

Product safety assessment and emergency response procedures

We use a product prioritization tool that objectively scores the safety profile of our products, forming the basis of our product prioritization strategy. The tool ranks our products into high-, medium- or low-risk categories, defining our approach for benefit-risk activities and product safety surveillance. Our actions include individual case safety report management, signal and risk management, our benefit-risk strategy and aggregate safety reporting. These measures ensure the **efficient management of safety** risks of our medicinal products throughout their life cycles.

If our safety risk assessments identify any emerging safety issues, safety observations that require urgent safety measures or other new safety information that could impact the benefit-risk balance of the medicinal product (e.g. product recall as part of crisis management), we promptly notify health authorities via the respective emergency response procedures. These steps include seeking health authority approval for further actions and communicating the information to relevant healthcare professionals. In addition, we promptly share this information with our business partners and clinical trial investigators, enabling them to take proper actions where the medicinal product concerned is used.

Innovative safety signal detection

Through our tools for safety signal detection, we analyze and manage large volumes of global data, such as scientific studies and information about adverse events in connection with our medicinal products. These tools ensure we retain adequate oversight and comply with regulatory timelines for safety signals and other safety-related factors. They also enable us to archive all signal data, documentation and decisions in a unified repository, which facilitates easy data access and analysis as well as cross-functional collaboration between our Global Patient Safety unit and other internal and external stakeholders**.**

Up-to-date labeling and product information

Our product information explains to healthcare professionals and patients how to correctly use the respective product and make informed treatment decisions. In accordance with statutory regulations, the **package leaflet** contains all relevant information such as indication(s) and ingredients as well as dosage, storage, mode of action, instructions for use, warnings, precautions, and possible adverse effects. In addition, should the medicine contain ingredients that could impact the environment, the package leaflet may also contain information about how to dispose of the product correctly. We review and update product information documents, such as package leaflets, thereby, we want to ensure our medicinal products contain the latest information on safety, efficacy and pharmaceutical formulation. In accordance with regulatory requirements, we submit modifications to our leaflets to the respective regulatory authorities for approval. In 2023, there were no reportable incidents of non-compliance with regulations concerning the labeling of our medicinal products.

Internal and external training

Our pharmacovigilance experts are regularly trained so that they gain and maintain the required experience and knowledge to carry out their activities. We manage our training via a global learning platform and verify compliance with our training requirements by producing training completion reports.

Our approximately 25,000 internal and external Healthcare employees receive **basic pharmacovigilance training** once a year that covers the procedure for reporting adverse effects or special circumstances associated with the use of our medicinal products. In addition, other training courses keep employees up-to-date with

respect to their professional expertise as well as internal standard operating procedures and other relevant requirements. These continuing education and training efforts help us to ensure adherence to pharmacovigilance requirements.

Enhancing patient safety and sharing expertise with other countries

We share our experiences and expertise and engage in dialogues about pharmacovigilance with health authorities by contributing to initiatives hosted by non-profit organizations and industry associations. We actively participate in expert committees and industry groups worldwide, such as the European Federation of Pharmaceutical Industries and Associations (EFPIA), the Pharmaceutical Research and Manufacturers of America (PhRMA), the Kenyan Association of Pharmaceutical Industry (KAPI), the Association des Laboratoires Pharmaceutiques Innovants (ALPI) in Algeria. We also network with health authorities to improve the safety of our medicinal products and promote the topic of pharmacovigilance.

For example, as an active member of the non-profit organization TransCelerate, we have directly contributed to initiatives such as intelligent automation opportunities in pharmacovigilance, pharmacovigilance agreements optimization and the interpretation of guidance documents and regulations. We also maintain a long-term partnership and regular dialogues with the health authority in Kenya via KAPI and we have contributed in 2023 to the work of the ALPI to help the Algerian health authority refine pharmacovigilance guideline.

Reporting side effects via app

Since 2017 we have been offering a reporter-oriented method, a mobile and web application. It allows field forces, sales representatives, healthcare professionals, pharmacists and non-medically trained users to **report any suspected side effects** or adverse events arising from the use of our medicinal products. Since 2023, the application has been available in 14 languages in over 70 countries.

Campaigns for patient safety

We celebrate **Patient Safety Day** via our affiliates worldwide to raise awareness about this vital topic. In 2023, we organized various online and on-site events with affiliates in all continents and jointly celebrated Patient Safety Day with other companies in India and Kenya.

Pharmacovigilance in Access to Health

We strive to continue expanding pharmacovigilance expertise worldwide, particularly in countries where healthcare workers need to build this expertise.

We continue our efforts to increase the contribution of pharmacovigilance in our **Access to Health strategy**. The key aspects of this strategy include fostering pharmacovigilance initiatives in safety data-sharing with health authorities and sustainably building pharmacovigilance capacity with reputable partners in underserved countries. For example, we have maintained a stable partnership with the Tunisian health authority over many years to actively establish the national pharmacovigilance system through various initiatives. In 2023, we sponsored or partnered with health authorities in Tunisia and Morocco to support their pharmacovigilance congresses. We also included patient safety in our rollout of trainings to 28 pharmacy students in Saudi Arabia, and around 350 pharmacy students in Egypt. We launched an initiative to raise awareness about thyroid treatments in Indonesia.

Access to approved medication for unapproved uses

We may receive inquiries about the therapeutic use of our **products beyond the marketing authorization**, also referred to as off-label use. For example, while each medicine is authorized for use in specific indications, a physician, based on an individual benefit-risk assessment, may wish to administer a product to a patient suffering from a serious disease for which it is not approved.

We promote our medicines strictly within the scope of their specific marketing approval. Any medical-scientific information about the use of our products beyond their existing marketing authorization is provided by qualified medical personnel in response to unsolicited inquiries. The information shared must be backed by scientific evidence, factually balanced and clearly state that it applies to unapproved use. To maintain compliance, we have implemented a standard to govern these requests. We also do not permit our employees to give any recommendations regarding individual patient care or treatment.

Product-related crime

In low- and middle-income countries as well as industrialized countries, illegal, counterfeit and substandard medicines pose a significant risk to public health. In addition, chemicals may be misused for criminal purposes, such as the manufacture of illicit drugs. We take resolute action against both of these criminal activities.

Our approach to product-related crime

Our company develops and manufactures pharmaceutical and chemical products of high quality. We take resolute action against product-related crime in order to protect our patients and customers from the harm caused by illegal products. For this purpose, we have implemented a Group-wide strategy, which focuses on identifying and responding to the availability of counterfeit medicines as well as ensuring the integrity of our products and supply chains. Moreover, we are committed to collaborating with government authorities as well as national and international organizations. Together, we want to tackle product-related crime and raise awareness of the issue among stakeholders and the wider public.

How we define product-related crime:

1. **Counterfeit products:** In line with the relevant **WHO** standard, we define a counterfeit product as “a product that is deliberately and fraudulently produced and/or mislabeled with respect to its identity and/or source” to make it appear to be a genuine product.
2. **Illegal diversion of products**: This term refers to the diversion of either pharmaceuticals or chemical substances from within the legitimate supply chain either to sell or export them through illegal channels to produce narcotics, weapons or explosives, or to use them for other illegitimate purposes.
3. **Misappropriation of products:** This refers to theft from production sites and warehouses, or while in transit.

Roles and responsibilities

The Corporate Security unit coordinates our approach to tackling product-related crime on the strategic level. Experts from various units, including Legal/Trademarks, Product Security, Export Control, Supply Chain, Patient Safety, Regulatory Affairs, and Quality Assurance support the operational implementation of the strategy. Furthermore, our sites have product crime officers who serve as central, local points of contact and act as the interface between both local and global stakeholders, internal and external alike.

Our commitment: Group-wide guidelines and standards

Globally applicable regulations are a key part of our approach to effectively and efficiently tackling product-related crime. The Group-wide guideline entitled Illicit Trade & Product Crime Prevention describes our goals and measures for reducing product-related crime and minimizing its impact. Our Group-wide Product Crime Incident Management standard sets out mandatory requirements for effectively managing incidents of product-related crime.

How we are tackling product related crime

1. Detecting counterfeit medicines and taking them out of circulation

A team of experts examines, evaluates and processes notifications we receive regarding suspected counterfeit medicines. Our response aims to comply with both the regulatory requirements and our own wider objectives for tackling counterfeit products. We proactively **conduct investigations** both online and offline in order to identify and disrupt the availability of illicit products in legitimate and illegitimate channels. We document incidents using a central, Group-wide reporting system. Moreover, we support the prosecution of criminals by working closely with the authorities. As a member of the Pharmaceutical Security Institute (**PSI**), we routinely share intelligence about product crime with other pharmaceutical companies.

In 2023, our internal experts examined and pursued numerous incidents, including **counterfeits identified within the legitimate and illegitimate supply chains** as well as theft and illegal diversion.

2. Tracking system for chemical substances

We monitor chemicals that could be misused to produce illegal weapons, explosives or narcotics by tracking them through an **internal system** that flags suspicious orders or orders of sensitive products. These are released only once we have confirmed the existence of a verified end-user declaration.

In addition to fulfilling the duties defined in the **statutory provisions on export control**, we also report suspicious orders and inquiries to the competent authorities. Through these efforts, we are honoring a voluntary commitment of the German Chemical Industry Association (**VCI**) and complying with the terms of the Guideline for Operators published by the European Commission.

3. Protecting integrity of our products and supply chains

We intend to ensure the integrity of our supply chains on the one hand and reduce the likelihood of illegal medicines circulating on the other hand. For this reason, we have robust security measures for products and supply chains.

We strive to fulfill the regulatory requirements on product serialization and the implementation of track-and-trace technologies as prescribed in many countries and regions. This includes clear bar coding of individual and collectively packaged products for transport so that they can be traced in the supply chain.

Using a risk-based approach, we apply our own product security features on certain products. This enables the rapid and reliable authentication of our products.

We monitor our supply chain closely and we regularly **audit our distributors and contract manufacturers** to ensure that they comply with our **GMP** and **GDP** standards (good manufacturing practice/good distribution practice). Moreover, we carry out special risk-based safety audits on suppliers of pharmaceutical packaging and contract manufacturers.

The security measures at some of our most important global sites are certified externally in accordance with internationally recognized standards, including requirements of the U.S. customs authority’s C-TPAT (Customs-Trade Partnership Against Terrorism) initiative, the AEO-C/S (Authorized Economic Operator) certificate of the European Union, approval as a recognized shipper by the Luftfahrt-Bundesamt (German Federal Aviation Office).

Furthermore, we sponsor global initiatives to protect patients. For instance, we support the non-profit Global Pharma Health Fund (GPHF), which supplies the GPHF-Minilab®, a compact laboratory used mainly in countries

with inadequate access to health solutions. This allows users to quickly and effectively test the quality of 113 different active ingredients. Since 2023, six additional active ingredients for the treatment of heart disease have been added to the compact lab’s method portfolio. Currently, a total of 1012 Minilabs are in use. In 2023, 36 Minilabs were delivered, of which 34 went to fifteen countries in the Sahel zone and sub-Saharan Africa.

4. Raising awareness of product-related crime

We aim to continuously raise awareness of product-related crime among our business partners and employees, educating and training our people Group-wide on the subject to strengthen their competencies. Our employees involved in security, such as product crime officers, participate in appropriate **training programs**. We are continuously evolving these programs and adapting them to new trends.

EMPLOYEES

137 Career with us

143 Corporate culture

148 Diversity, equity & inclusion

157 Health & safety

Career with us

Our employees advance human progress by solving complex problems and promoting our culture of innovation and inclusion. We encourage them all to pursue careers that align with their individual aspirations, skills and passions. To maximize our potential throughout the Group, we aim to create an environment that inspires our current employees, attracts new talent and helps us to continue to learn and grow.

Our approach: A career with purpose

To ensure our ongoing success, we are focusing on the future by creating meaningful impacts and building needed capabilities. At the same time, we must respond to changing demographics and adapt to the behaviors and expectations of the highly competitive talent market. Therefore, in 2023, we continued to enhance our **talent acquisition strategy** with a more personal, employee-focused approach. Our talent sourcing approach aims to build inclusive pipelines and effectively recruit diverse talent with the needed competencies and capabilities to our organization. In addition, our talent retention approach is inclusive in targeting various employee groups. In 2023, we intensified our efforts to support internal mobility. For example, we launched a dedicated project to improve organizational agility, up-skilling and re-skilling, retention, and engagement. Specific modules went live in 2023, and we will roll out the complete platform with all functionalities during the course of 2024.

Our trainee and vocational training programs are an effective way to meet current and future demand for qualified professionals.

Supporting our employees' professional and personal development helps us to meet our strategic objectives, driving our success as a company. In a fast-paced environment of continuous growth and innovation, we want to cultivate and develop the capabilities of our employees. As a result, our employees benefit from a diverse learning and development portfolio. In addition, our dedicated management programs help our leaders to promote accountable and inclusive behaviors and educate them on driving long-term business value and performance.

We have designed our compensation structure to provide **valuable benefits** to our employees and their families. Our benefits offerings recognize the diversity and uniqueness of our employees while providing flexibility wherever possible. Additionally, our international employee mobility programs create an environment suited to the needs of a rapidly evolving workforce.

Roles and responsibilities

Group Human Resources (HR) supports and advises all business sectors and Group functions within our organization regarding our human capital, especially topics related to recruiting, vocational training and advanced training. Across all our sites, HR employees work with leaders from various functions and business sectors to employ strategies that engage our people in line with Group-wide HR guidelines and requirements, including attractive compensation models and benefits. In accordance with the audit plan, we conduct internal audits every two to three years to ensure that we implement our guidelines effectively.

The Chair of the Executive Board and CEO is responsible for Group Human Resources. Our Chief HR Officer, who leads the HR function and oversees all our HR activities, reports directly to the Chair of the Executive Board and

CEO. Our Business Services unit oversees the operational tasks of HR work, such as drafting contracts and payroll accounting. The Chief Financial Officer is responsible for this unit.

All employees can access their personal data via our **HR4You digital platform**, which aligns our basic HR processes globally. For instance, the platform enables employees to participate in online training courses or apply internally for vacant positions.

Our commitment: Structured development

Our High-Impact Culture, founded on **six behaviors**, is integrated into all HR processes, from recruitment and training to feedback processes. We regularly inform managers and employees about these behaviors through global campaigns.

Our People Development and Learning Policy provides a Group-wide framework that guides employees in managing their professional growth. It defines requirements for our development opportunities, roles and responsibilities.

Our **flexible work guideline** details our approach to evolving work environments and our aspiration to create a more agile organization. For example, employees can choose their desired working location (with the agreement of local guidance, teams and managers) provided it is appropriate for their work activity and balances remote work with in-person collaboration. We maintain a strong on-site presence as in-person interaction fosters collaboration and strengthens our culture. In addition, we aim to better support and recognize the well-being of carers by creating a carer-friendly workplace.

Furthermore, our **policy on cross-border remote working** allows employees – under certain conditions, with the support of their manager and in adherence to compliance measures – to work remotely for personal reasons outside of their country of employment for up to 60 days within a 12-month period.

Attracting and inspiring key talent

Our overarching goal is to attract qualified employees and retain them over the long term. Therefore, we continue to improve the way in which we introduce new employees to our company culture. For example, in 2023, we launched our new employer value proposition that will help us continue attracting and retaining the best talent in the future.

We also train our **Talent Acquisition** staff on how to take aspects such as diversity, equity & inclusion (DE&I) and unconscious bias into consideration during the recruitment process. Additionally, we continuously review our application process and hiring manager enablement to maintain a fast, quality-driven process.

A competitive compensation and benefits structure

We reward the performance of our employees in order to maintain a competitive edge in attracting and retaining the best talent. Within our Group, we base compensation on the requirements of each position and each employee’s respective performance. We make no distinctions based on gender or any other diversity criteria. To ensure we maintain a **competitive compensation structure**, we regularly review our compensation policy based on data analyses and industry benchmarks. This enables us to compare internal factors and

market requirements in equal measure. Before making changes to our compensation structure, we consult with key stakeholders such as employee representatives, as applicable.

In addition to individual performance, our annual incentive plan also measures company performance based on financial and non-financial key indicators in our scorecard. The non-financial key indicators focus on the company's priorities and are designed to support our High-Impact Culture as well as our sustainability strategy and progress in terms of diversity, equality and inclusion. Furthermore, since 2022, we have included a sustainability factor in our Long-Term Incentive Plan (LTIP). More information on the LTIP can be found in the **Notes of our Annual Report**.

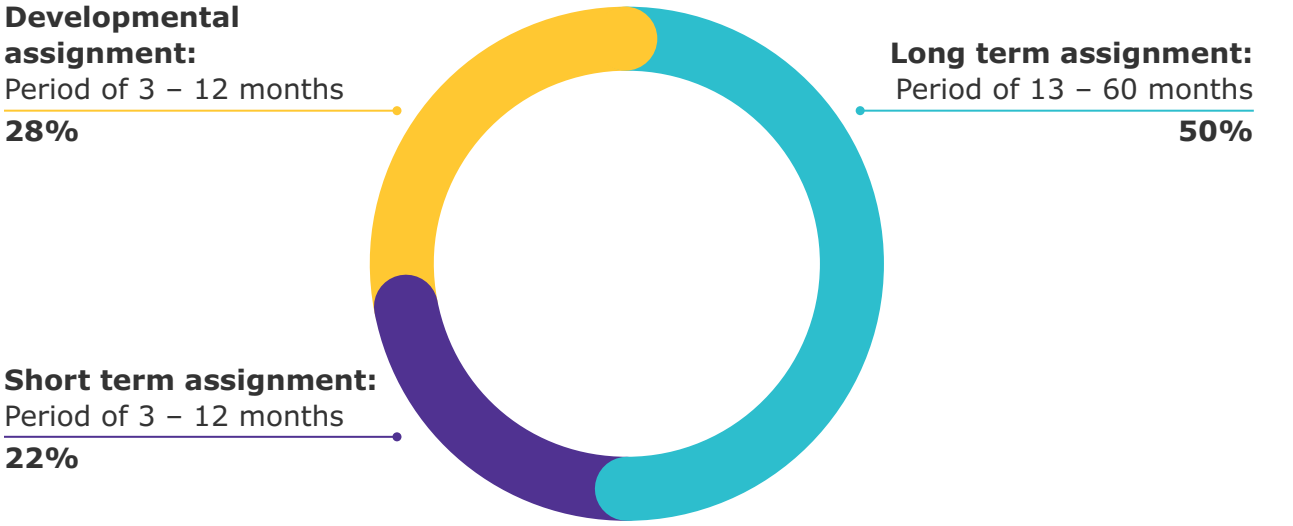
In addition to competitive pay, we also offer attractive benefits through our benefits programs. For example, with our global car policy, we aim to reduce CO_2 emissions by encouraging the use of electric vehicles and supporting charging points. In addition, our benefits package contains offerings primarily funded by the company, in part country-specific, such as company pension plans, healthcare and other employee insurances as well as other services, for instance leasing offers for bicycles or discount schemes to meet the multifaceted needs of our global workforce.

In 2023, we introduced a fertility benefit policy, which provides reimbursement for fertility treatments in eight of our markets by employee size (Brazil, China, Germany, India, Mexico, United Kingdom, Switzerland, and Taiwan). Including the countries that already offered this company benefit (Canada, Japan and United States), we now cover 73% of our employee base and continue the global rollout in 2024. The benefit (subject to local rules and regulations) provides financial support to our employees and their partners, regardless of marital status or sexual orientation, for treatments after October 2023.

Nurturing a global mindset

To broaden the **diversity of thought** within our teams, we offer multiple international assignment opportunities that enable our employees to experience different cultures, mindsets and ways of working. In 2023, we monitored and improved our Global Mobility Long-Term Flex program. It enables our employees to acquire international exposure and benefit from greater working flexibility for durations exceeding one year.

Mobility split by assignment type



Unlocking our potential with education and professional development

We have implemented a holistic learning and leadership portfolio, which we are continuously enhancing in accordance with the principles of our **High-Impact Culture and set of behaviors** in order to foster greater levels of accountability, inclusiveness and engagement. Our learning portfolio also helps our employees to understand and embrace the principles, values and behaviors of our corporate culture.

We endeavor to support our **employees' personal and professional development** in line with their strengths, skills and behaviors. Therefore, we provide ample opportunities for the functional and technical upskilling required in the various areas of our organization. We recognize that employees need to develop capabilities for the future and acquire skills to adapt quickly to changing markets and organizational needs. Beyond cultural and soft skill learning and development opportunities, functional training, such as digital upskilling or scientific training, provides additional opportunities for development in specific areas.

Our new high-potential approach aims to develop, engage and retain our top talent. It supports their individual needs by helping them to design customized development journeys and increase their impact at work. These high potential individuals, who comprise around 5% of our global workforce, serve as role models, embody our values and behaviors, demonstrate learning agility, and are highly motivated to develop beyond their existing roles. Once designated, high potentials have a joint responsibility with their manager to progress in their targeted development journey. HR provides support with exclusive offerings for this specific target group.

Furthermore, our Development Advisor tool provides specific learning and development resources, for example e-learning courses, formal training offerings and self-facilitator toolkits. It is recommended that employees shape their development plans with components covering formal training (10%), opportunities to interact and learn from others (20%) and learning by doing (70%).

Our employees can book learning offerings, such as e-learning courses or in-person training, via our **learning management system**. Additionally, we encourage our employees and leaders to take courses via the LinkedIn Learning platform. In 2023, about 6 million training courses were completed.

In April 2023, we introduced a central **coaching platform** through which our employees can book their coaching sessions directly from a global pool of certified coaches. In one-on-one sessions, employees can learn to identify their relevant development areas and overcome business challenges.

Our Group-wide learning and leadership portfolio includes learning programs for individuals and teams. The **Empower Your Team program** introduces our leadership culture and the basics of leadership, such as decision-making, feedback, motivation, and emotional intelligence. **Empower Your Organization** is aimed at more experienced leaders and focuses on the capabilities needed to shape our culture, covering topics such as inclusiveness, psychological safety and transformation. About 750 of our leaders participated in these courses in 2023.

Merck University is our leadership development program for executives and collaborates with best-in-class business schools, including **Stanford GSB** in the United States and **INSEAD** in France. Established in 1999, more than 620 of our executives worldwide have participated in the program, enhancing their skills and professional development via state-of-the-art leadership learning methods, content and tools. Senior leaders taking part in Merck University also have several touchpoints with high-potential individuals in our second flagship program, the International Management Program (IMP). The IMP identifies and nurtures talented people who show potential to become our senior leaders of the future.

The Supervisor Academy is a development program for leaders in non-desk environments such as production and laboratory. The program's key goal is tailored leadership development that addresses the challenges of these leaders. We have run the program for several years in selected markets (United Kingdom, United States and Switzerland) with positive feedback. The Supervisor Academy is now mandated to be rolled out globally while content and processes are updated as needed.

Supporting the next generation

We believe in the value of investing in the next generation of talent, not just to build a diverse talent community, but also to develop the skills needed to continue to deliver our products.

To attract, maintain and build relationships with our diverse talent community, we use channels including career events, university relations and social media as well as other online platforms such as Candidate Relationship Management.

We also support talent in joining our organization through various internships and relationships with universities around the world. One example of this is our Healthcare business sector's Co-Op program with Northeastern University, Massachusetts, USA, where students gain first-hand experience with our manufacturing and R&D processes.

At the global level, we run our **GoGLobal** and **OLDP** (Operations Leadership Development Program) traineeships and we build relationships with students from multiple disciplines as well as academic researchers who show great potential and are interested in roles within our company. Every year, we hire around 40 new trainees across functional areas such as In-house Consulting, Marketing, Commercial, Strategy, Manufacturing, Operations & Supply Chain, Data & Digital, Research and Development, Procurement, Finance, and Human Resources. We offer our trainees mentoring, training and development opportunities.

Graduate hiring by gender

We have been steadily increasing our focus on vocational training. For example, we are investing more than € 70 million in a new Learning Center at our global headquarters in Darmstadt. With a capacity for around 600 apprentices, it will enable us to house almost all our vocational training occupations under one roof as of 2024.

In 2023, a total of 226 apprentices in Germany started their vocational training. The overall focus was on **scientific and technical occupations**. During the same period, a total of 190 apprentices successfully completed their vocational training at our Darmstadt site. In addition, at our Darmstadt site, we offer programs for refugees and young people struggling to enter the labor market, preparing them for subsequent vocational training.

We also continued to engage in the “Afrika kommt!” program offered by the German Society for International Cooperation (GIZ), which trains experts and leaders from African countries. In supporting this initiative, we are helping to build a pool of regional partners who promote economic cooperation between Germany and Africa. In 2023, 13 participants successfully completed the program.

Balancing work and personal life

We recognize the importance of a healthy **work-life balance** and flexible working models that accommodate the needs of individuals and teams. Accordingly, we have enhanced our Flexible Working Policy to reflect today’s dynamic business landscape while supporting an engaging and productive working environment. As part of this process, in 2023, we implemented a new policy that allows up to two days of remote work and three days working in the office per week, taking into account the legal, tax and compliance aspects in the various countries.

Corporate culture

For more than 350 years, we have worked to improve and enhance people's lives worldwide. Our High-Impact Culture enables us to continuously re-examine our ways of working and challenge long-held assumptions to advance human progress. It motivates us to recruit, develop, retain, and promote the best and most diverse talent, while cultivating and rewarding an inclusive environment.

Our approach: Unlocking our collective potential

We recognize that our daily actions ultimately impact our customers, patients and partners. This is why we have identified a standard set of behaviors that form the foundation of our High-Impact Culture such as 'raising the bar' and 'acting as the owner'. They continue to be firmly embedded in our company culture to provide guidance to all our employees and leaders.

We believe acknowledging and rewarding individual achievements, as well as a **feedback-driven culture**, enable collective success. Accordingly, we have introduced a new approach to performance, providing our teams with a framework that values employee expectations, clarifies goals, provides feedback, and rewards performance as part of our High-Impact Culture.

A constant shift towards learning from others, delivering and receiving feedback, and acknowledging the perspectives of others in constructive ways are also crucial elements of our culture. By promoting an open mindset, we empower our employees and strengthen our organization.

We also work to increase employee engagement and promote individual accountability by creating regular opportunities for dialogue and participation within the company. For example, **employee surveys** with regular feedback opportunities provide valuable data points for managers, employees, and Human Resources (HR) to conceive new measures and initiatives that promote a culture of dialogue and collaboration in the workplace.

Roles and responsibilities

Global Human Resources (HR) is responsible for advising all business sectors and Group functions on matters concerning human capital. HR addresses the needs of our employees, organizational topics, and company culture founded on ethics and a shared set of company values.

We expect our leaders to understand the needs of their diverse teams and provide support in the form of resources and data. In addition, the ability to access transparent feedback through specially developed tools enables our leaders to gain further insights into how their behavior impacts their teams. For this reason, we work with external providers to **train our leaders** in proven, science-based approaches to lead more effectively.

Our commitment: Employee representation

As set down in our **Social and Labor Standards Policy**, we will respect our employees' legal rights to form and join worker organizations of their own choosing, including labor organizations and trade unions, and will not discriminate based on an employee's decision to join or not join a labor organization.

Within Europe, 40 of our legal entities in nine countries (Austria, Finland, France, Germany, Italy, Spain, the Netherlands, Ireland, and Switzerland) have employee representatives. Our respective site management teams cooperate with them at the local level. In addition, the Merck Euroforum represents our employees from a European perspective in all EU countries, as well as Switzerland, Norway and the United Kingdom. However, not all entitled countries send delegates to the Euroforum. The Euroforum focuses on the current global economic situation, employment rates and significant changes within our company that affect more than one country, with regular exchanges during the year and additional meetings as required. We have Merck Euroforum delegates from 14 countries. All delegates meet once a year.

In Germany, one of our largest locations worldwide, 99% of the local workforce is employed by subsidiaries subject to the German Co-Determination Act. We have a total of 20 subsidiaries in Germany. In 16 of them, our employees are represented by the Group Works Council; in nine of them by the Joint Works Council in Darmstadt; the remainder are represented by their local Works Council. The interests of our senior executives are represented by the Senior Executive Committee. The co-determination bodies negotiate topics such as compensation, working hours and organizational changes. In addition, 58% of our German employees are covered by collective agreements (just above 12% of our global workforce).

In countries not covered by collective bargaining agreements due to different administrative, trade and judicial structures, we closely work with unions to implement operational decisions and coordinate relations between management and employees. Working conditions and terms of employment of employees in these countries are determined by legal requirements and our Global Guidelines.

Strengthening our High-Impact Culture

We aim to create a positive culture based on our strategic core elements of caring, outperforming and pioneering. By fostering our **High-Impact Culture**, we empower our people to create positive outcomes for our customers, patients and society. As part of this culture, we promote a mindset that guides how we do business and interact with colleagues and stakeholders. By embracing a standard set of behaviors, we can deliver on our purpose and create a work environment where everyone can succeed, develop and grow. These behaviors also embody our shared values and help to ensure our teams reflect different cultures, ways of thinking and life experiences.

These behaviors are:

care	pioneer	outperform
Obsessed with customers and patients	**Be curious and innovate boldly**	**Raise the bar**
We **focus on the impact** we generate, we **start with them in mind** and work backwards.	We **challenge our own thinking and the status quo**, press for better approaches, innovative ways, and **we are externally aware**.	We set **relentlessly high standards** for ourselves – and for our teams. We drive to **deliver the best quality** products, services and processes.
Act as the owner	**Simplify and act with urgency**	**Disagree openly, decide, and deliver (3Ds)**
We are owners, we make decisions and **act on behalf of the company's best interest**, not just our own.	We see beauty in **simplification**, we cut unnecessary processes and **focus on what matters most first** – and we change course quickly when necessary because **speed matters** in every business.	We think independently and **deliver as a team**. We make clear what matters in any decision, **taking accountability** and avoiding deferring difficult decisions. And when a decision is taken **we all commit**.

In 2023, we launched MyImpact, our new approach to guiding, managing and evaluating performance within our company. MyImpact provides the framework to improve our performance and encourage continuous feedback and personal growth. The framework ensures we align our commitments, assess everyone's impact and drive collective success in a transparent and performance-oriented way.

MyImpact enables:

- **Focus:** Agreement and year-round adjustment of commitments to meet current business requirements, incorporating our six behaviors to drive our High-Impact Culture.
- **Feedback:** Engagement in regular performance conversations supported by feedback collected from colleagues.
- **Recognition:** Financial rewards for outstanding contributions by using timely and flexible performance-related recognition tools.
- **Efficiency:** Creation of a new and simplified way to evaluate employee impact, reflecting our High-Impact Culture.
- **User Experience:** Implementation of intuitive solutions to help employees stay up-to-date and drive their performance journey.

Strengthening our sustainability culture

Since 2021, e-Learnings on our sustainability strategy are a mandatory training component for existing and new employees. While this was the first step of our upskilling journey, we have extended our offer with function- and hierarchy-specific educational activities. Furthermore, from 2023 on, we use the sustainability questions from our annual employee engagement survey to measure the impact of our activities. The survey results are only used internally. They help us to understand the maturity of a sustainability mindset in the company and to detect and address functional, regional or hierarchical differences. The corresponding key indicator “Result of the employee engagement survey on sustainability culture” replaces the previous year’s achieved key indicator “Percentage of employees trained on sustainability”.

Embracing conversation and dialogue

In our increasingly connected world, we are convinced that feedback enhances open dialogue, builds trust and improves collaboration. For this reason, we have upgraded the functionality of our **360-degree feedback tool**, which encourages our employees to promote continuous feedback based on integrity and respect. The tool also provides guidance on integrating feedback practices into daily work and structuring feedback conversations accordingly. With new training materials, we aim to ensure our colleagues embrace our feedback culture and make constructive dialogue a habit rather than a formal process.

In this context, we are also promoting psychological safety to help our employees work more efficiently while feeling safe, respected and accepted. As our leaders play a critical role in creating the right atmosphere within their teams, we ensure that psychological safety is a core topic of our leadership development program **Empower**. We also provide a dedicated toolkit with practical guidance and actions that leaders can implement to promote psychological well-being.

Empowering our employees

We are committed to ensuring our employees and leaders are involved in our business processes and can engage in dialogue through various channels. These include internal communications platforms, anonymous surveys and roundtables.

Since 2022, we have measured our employees' experiences throughout their employee lifecycle, from onboarding to exiting the company. For example, we evaluate feedback from the onboarding experience after 90 days and again after three months. These measures help us understand the experiences of new employees and identify any areas of improvement. Similarly, our exit surveys and interviews collect insights into why employees voluntarily leave the company.

In addition, we evaluate the progress of implementing our High-Impact Culture by conducting pulse surveys. In 2023, the health and well-being of our employees was the primary focus of our pulse survey in spring. Our other main feedback formats include a yearly global employee engagement survey that serves as the main feedback channel for all our employees. In this survey, we expanded the scope of countries participating in the voluntary "self-identification" questions (self-reporting about disabilities, LGBTQIA+ and ethnic groups). These data points help us create a more **inclusive environment** for members of underrepresented groups. Since 2022, our engagement survey includes questions about commuting to calculate the CO_2 emissions produced by our employees traveling from home to our sites worldwide.

Diversity, equity & inclusion

We believe that creating and maintaining a diverse workforce helps us drive innovation, exceed customer expectations and remain economically and socially sustainable. Diversity, Equity & Inclusion (DE&I) also supports our goals of attracting and retaining talent who enrich our culture and help us create new solutions to tomorrow's challenges.

Our approach to creating a culture of belonging

We are committed to promoting a strong sense of inclusion and belonging among our employees. Therefore, we approach Diversity, Equity & Inclusion (DE&I) with the same purpose as our other global business objectives and aspirations. While we have always been a diverse organization – we currently span 65 countries and have about 63,000 employees from **141 nationalities** – we recognize that our success depends on our ability to foster equity and inclusion. In addition, our DE&I approach fuels our efforts to make positive impacts in the communities where we live and work. We expect our leaders and managers to be mindful and considerate in how they attract, hire, retain, and promote their people. We aim to help every employee maximize their potential, regardless of their gender identity, culture, ethnicity, race, religion or creed, sexual orientation, nationality, socioeconomic and family status, language, disability status, age, mindset, faiths, military service, or political conviction.

We strive to create **equitable outcomes** and identify and eliminate any barriers that may hinder our employees' contributions or their access to opportunities or career advancement. Ultimately, we believe diversity inspires progress and strengthens our ability to innovate in all areas of our business.

It is the uniqueness of our people that brings science, curiosity and our High-Impact Culture to life. That is why we nurture an environment with a **collective sense of belonging** so that all our team members feel valued and appreciated. An inclusive approach improves the overall performance of the company and generates more positive outcomes for customers, patients and partners.

Roles and responsibilities

The Chief Diversity, Equity and Inclusion Officer is responsible for our global DE&I strategy and for steering its related activities. In this role, she reports directly to the Chair of the Executive Board, whose Board responsibilities include Group Human Resources.

In addition, we have established a centralized **Diversity Council** comprising high-ranking executives from all our business sectors and selected Group functions. The Diversity Council's responsibilities include:

- Supporting equity and inclusion across our organization and its activities.
- Serving as ambassadors and advisors to the Executive Board and managing directors in country organizations.
- Proposing strategic goals, initiating measures and encouraging managers to meet their responsibilities in their respective units.
- Exchanging information, sharing best practices and aligning on next steps.
- Working across businesses, functions and countries to integrate DE&I within our daily work to benefit our employees and customers.

In turn, the members of the Global Diversity Council chair Diversity, Inclusion, Community, and Equity & Engagement Councils in their respective businesses.

Our commitment: International policies and principles

Our **Social and Labor Standards Policy** categorically states that our company does not tolerate any form of discrimination, physical or verbal harassment, or intolerance. To underscore our commitment to equality, fairness, inclusion, and tolerance in the workplace, we also participate in industry-wide initiatives:

- The **Women's Empowerment Principles**, an initiative of UN Women and the UN Global Compact network, help to promote gender equality and women's empowerment in the workplace. In 2023, we also participated in the **Target Gender Equality Programme** of the UN Global Compact, which supports companies in achieving gender balance in business.
- The Inclusion Action Plan of the German Mining, Chemical and Energy Industrial Union (**IG BCE**) defines concrete measures to create a more inclusive environment for employees with disabilities. In endorsing this plan, we meet the standards of the United Nations Convention on the Rights of Persons with Disabilities.
- The **Equal Opportunity Charter**, through which we pledge to do everything in our power to achieve gender equality within our company.
- We are one of more than 5,000 signatories of the **German Diversity Charter** and a member of the German Diversity Charter association, a corporate initiative that promotes diversity in companies and institutions.
- We are signatory to the **CEO Letter on Disability Inclusion** to support and promote the inclusion of people with disabilities.

In addition, we are a signatory to the **Business Coalition for the Equality Act**, an alliance of leading companies in the United States. We are also active in a number of external associations and public-private partnerships supporting equality, such as Healthy Women, Healthy Economies, ClosinGap (Spain), Women Empowerment Council (China), SEMI industry association (dedicated DE&I initiative), Embracing Carers™, and **Disability:IN**, promoting the full inclusion of people with disabilities.

Meeting statutory requirements

The German Act on the Equal Participation of Women and Men in Leadership Positions in the Public Sector and the Private Sector has been in force in Germany since 2015. Due to our legal status as a KGaA (a corporation with general partners), this law also applies to us in part.

With a 37.5% share of women (6 out of 16 members), our Supervisory Board already meets the requirements of German gender quota legislation. As a KGaA, we are not required to set targets for our Executive Board, which currently has a 40% share of women (2 out of 5). Detailed information can be found in the **Statement on Corporate Governance** in our Annual Report.

Strategy implementation

In 2023, we continued driving our global DE&I strategy. We accelerated the impact of our national DE&I advocates in our 18 major countries and developed tailored roadmaps for each market. We also published our **Premier DE&I Report**, providing detailed evidence of our strategy implementation and initiatives.

Progress on our 2030 aspirations

In 2021, we pledged to our people, partners, patients, and industry to intensify our DE&I efforts and set robust aspirations. In 2023, we demonstrated that we are on track to meeting our 2030 goals.

Gender equity: We developed measures to achieve a more balanced gender structure at various hierarchical levels of our business. We are making consistent progress and have increased the share of women in leadership (roles 4+) to 39% (2022: 38%) and senior management positions (roles 6+) to 29% (2022: 27%) while maintaining a 44% proportion of women in our global workforce (2022: 43%). This means our share of women in leadership has increased by 12 percentage points since 2015. Building on these efforts, we aim to achieve gender parity in leadership positions by 2030. Moreover, we are committed to fair and equitable pay for all employees. Our Executive Board comprises two female members (our CEO and CFO) and three male members, bringing the share of women to 40% (2022: 20%).

Women in leadership

Culture and ethnicity: With 23% (2022: 24%) of our employees based in the United States and 27% (2022: 27%) of net sales coming from the United States it is crucial that we become an employer of choice among underrepresented racial and ethnic groups in this market. Therefore, we plan to increase the share of employees in U.S. leadership (roles 4+) who are members of underrepresented racial and ethnic groups from 23% (2022: 21%) to 30% by 2030.

Share of underrepresented racial and ethnical groups in US leadership

Additionally, due to our current performance in Asia, Latin America and the Middle East and Africa (MEA), accounting for 39% (2022: 40%) of our Group sales, we aim to increase the global share of nationals from Asia, Latin America and MEA in leadership positions (roles 4+) from 17% (2022: 16%) to 30% by 2030.

Global share of nationals from Asia, Latin America, Middle East & Africa in leadership

In 2023, we developed an Action Plan on Culture, Nationality and Ethnicity as well as a toolkit for leaders and HR to accelerate our progress as regards these aspects.

Inclusion: Beyond our aspiration to foster specific types of diversity and equity, we are accelerating our efforts to create a genuinely inclusive culture for all employees. To achieve this, we rolled out training courses to help leaders reflect on how they can lead more inclusively. All leaders will be encouraged to complete these courses over the coming years. At the end of 2023, 92% (2022: 64%) of our leaders had participated in this training program.

Participants in Inclusive Leadership Workshop

Diversity figures are part of our compensation-related corporate goals. We use a prediction algorithm developed in-house to support the modeling and tracking of our key indicators for DE&I.

Committed to fair and equitable pay

Our **commitment to pay equity** is a crucial aspect of our DE&I strategy. To create transparency around unexplained pay gaps and identify their underlying root causes, we started a gender pay equity analysis in 2021. In the first step, we analyzed ten of our largest countries, covering approximately 80% of our total workforce. In 2023, we extended the analysis to all countries, except North America which is planned in 2024. The identified adjusted gender pay gap continues to be less than 1.5%, which is below benchmarks in the industry. We have developed a plan for a recurring analysis to continuously monitor pay data and to take effective actions as needed. These include individual adjustments based on the results of the analysis, as well as educating our HR community on the topic and taking other steps to ensure we make equitable and unbiased pay decisions.

Cultivating inclusion every day

We provide a framework for education in the areas of diversity, equity and inclusion, combined with empowerment to support inclusive leadership strategies. To maximize our leaders' effectiveness in building diverse and inclusive teams, we offer the **Inclusive Leadership Workshop** as part of our inclusion key indicators. The workshop combines global leadership interactions, peer coaching, continuous self-reflection, and leadership accountability. It is mandatory for all our leaders.

We also offer various learning opportunities featuring training and listening sessions on how to be a more inclusive colleague, such as our unconscious bias training sessions. Highlights include our regular "CAREful Conversations" (an ongoing, carefully curated speaker and discussion series intended to inform and inspire) and "Moving Minds" (events and activities throughout November to embrace DE&I across our organization). With the introduction of the psychological safety module, we help our employees understand the importance of creating a safe working environment and fostering a culture where everyone's voice is heard. We also launched four new self-directed training offerings, focusing on a range of inclusion topics. In addition, the inclusion index on our Employee Engagement Survey helps us better understand specific areas of opportunity and gain employee insights to create a more **inclusive workplace**. More information on how we approach employee engagement can be found under **Corporate culture**.

Since we work in an international environment, we support our employees with intercultural training and digital tools such as our **Cultural Navigator**. We also offer language training and international networks to assist employees in international assignments and projects. For example, more than 1,200 employees are members of the International Community, which meets regularly at our global headquarters in Darmstadt.

We strive to maximize our support for employees who are caregivers and parents, from daycare centers in Darmstadt and Mumbai to emergency childcare services in the United States and Germany, as well as dedicated networks and leave options for those with caregiver responsibilities for elderly or sick relatives. On top of a paid maternity leave of no less than eight weeks across the globe, we offer further paid parental leave options for both primary and secondary caregivers in numerous countries.

We introduced a new fertility benefit in 2023 to provide financial support for fertility treatments. The benefit offer applies to all employees irrespective of their marital status, gender identity or sexual orientation, as well as their partners. Across our U.S. business, we have also launched LGBTQIA+ support, including medical plans and fertility coverage. More information on our benefits landscape can be found under **Career with us**.

In 2023, we also emphasized **making our sites more accessible** and accommodating. We introduced a toolkit that provides our site managers with guidelines and practical examples on how to ensure our workplaces are more accessible and inclusive for all. These measures include but are not limited to offering multi-level accessibility at our buildings and events, accommodating individuals with both visible and unseen disabilities and providing gender-neutral restrooms and changing rooms as well as nursing rooms. In addition, we cater to digital accessibility with an AI-powered web accessibility tool on our external websites and provide inclusive IT tips for our employees worldwide.

Helping diverse talent flourish

To broaden diversity within our organization, we have continued to create a strong internal female talent pipeline, promote more women into leadership positions, and actively source external female candidates. Additionally, we focus on internal development and external sourcing of international and underrepresented ethnic candidates. We have also identified opportunities in each business sector to provide extra recruiting support and leverage existing and new talent to reach more diverse audiences.

We have taken a range of steps to enhance diversity within internal mobility. For example, we delivered enablement sessions to our Employee Resource Groups (ERGs) to inspire our employees to lead their career development. We also further equipped our Executive Recruiting team with standards to take a more active role in hiring our organization’s next generation of diverse leaders. In addition, we ran DE&I Awareness & Best Practice Sharing workshops for our internal Talent Acquisition community.

In 2023, we also conducted voluntary self-identification campaigns in specific regions to better understand our internal demographics. These campaigns encouraged employees to voluntarily provide information about their ethnicity, sexual orientation, gender identity, and disability or veteran status.

To promote diversity while hiring internal roles, we continued our various **mentoring, sponsorship and talent programs**. We are also exploring new partnership opportunities to reach more diverse STEM candidates externally. Our programs include **McKinsey Connected Leaders Academy** (Career development for aspiring leaders from underrepresented ethnic groups), GEM (mentoring and internship opportunities for underrepresented ethnic group candidates in science, engineering and technology) and LOC **M Scholars** (providing tuition support for family members of existing employees from underrepresented ethnic groups). We also added information about our ERG community to our onboarding process to support new hires by informing them about the various employee groups and networks we manage around the world.

A sense of belonging: our employee networks

Our internal DE&I employee groups and networks have over 28,000 members in total (since a person can be active in more than one group, the number of people may differ from the number of members). These members have created a strong base that fosters a sense of belonging for community members and their allies. Our more than 60 groups and networks include **Women in Leadership, our Black Leadership Network, Rainbow networks, and I’M Able**. We are also strongly represented at our local sites in a number of women-oriented organizations operating globally.

In 2023, we updated the ERG governance framework. We also provided additional resources to the ERG community with a global summit and the launch of a central information portal on our intranet.

Our networks drive inclusion

Well-being communities

Focus on improving and preserving well-being by increasing awareness and creating professional opportunities in healthcare systems worldwide.

Disability communities

A community of people with disabilities and allies who break stigmas and support business leaders on disability equality journeys while sharing resources and learnings.

Culture & ethnicity networks

Help propose solutions to support the attraction, retention and development of employees of color as well as other cultural and ethnic minorities.

Women networks

Create an inclusive workplace that values, develops and advocates for the promotion of qualified women to achieve gender balance and long-term collective success.

Generational networks

Raise awareness, drive development and foster a culture where everyone has equal career opportunities regardless of their age or career status.

International community

A community of international, open-minded people dedicated to DE&I and elevating Merck to new levels of inclusion by representing our values and responding to the needs of new-comers and expats. The network exchanges resources and knowledge to support a soft landing at local sites in Germany, and Switzerland.

Rainbow networks

Promote a safe, inclusive and engaging work environment and foster a community where everyone, regardless of their sexual orientation, gender identity or gender expression, has the same rights and opportunities at all levels of our company.

Veterans networks

Support strategic diversity and inclusion efforts to attract, retain and develop military veterans in North America.

Inclusion networks

Focus on local needs specific to their respective groups, putting the spotlight on topics such as “Flexibility” and “Responsibility within the Community”, among others.

Supporting DE&I in the communities around us

In 2023, we continued our partnership with **CNote**, a women-led impact investment platform, to improve economic growth and opportunity in the U.S. communities in which we operate. We made a US$ 20 million commitment to CNote, providing capital to support BIPOC-owned and women-led small businesses in those communities via microfinance loans. This approach utilizes cash on hand that is held in our company's traditional bank accounts and instead deploys the cash to Community Development Financial Institutions that have a long track record of financial stability and serve low-income women and people of color entrepreneurs, fund affordable housing, and support other forms of economic inclusion.

In 2023, we expanded our commitment to supplier diversity to all of our three businesses in the United States, including all indirect spend categories. Our **Supplier Diversity Program** extends to historically underrepresented groups, including underrepresented ethnicities, women, LGBTQIA+ people, and veterans. We are committed to advancing DE&I at all levels of our organization and plan to expand the program to include direct categories and regions outside the United States, starting in 2024.

I'M IN is our external-facing DE&I initiative to amplify the voices of underrepresented populations and improve the healthcare ecosystem. Since 2019, we have collaborated with healthcare practitioners through educational events, enabling them to explore untapped topics of health inequity in multiple sclerosis (MS) care and learn how inclusion positively impacts the patient experience. In 2022, we established the I'M IN Neurodisparity Fellowship, dedicated to reducing disparities in neurological care for MS patients. We subsequently expanded the I'M IN fellowships to more therapeutic areas where our business is active, including oncology and reproductive health.

Additionally, we have established a **diversity in clinical trials** project, as we understand the need for a diverse patient population in **clinical trials** and throughout the drug development life cycle. To maintain inclusivity, we focus on four key pillars that identify key tactical and targeted efforts. We have collated these and other examples in an internal DE&I in the business playbook, encouraging our teams to consider inclusive approaches in R&D, product development, procurement, marketing, sales, and partnerships.

Ensuring fair treatment for all

We do not tolerate any form of discrimination in our company, as stipulated with binding effect in our **Code of Conduct** and **Social and Labor Standards Policy**. In January 2024, we published a new position paper on **disability inclusion** to complement our existing papers on **DE&I**, **non-discrimination** and **non-harassment**. In addition, we have established various reporting channels to ensure employees have a clear point of contact should they experience harassment or discrimination in the workplace or any other violations of our standards. Their first points of contact are their supervisors, HR or compliance teams, and they can also make anonymous calls to our **compliance hotline**. In the reporting year, our HR Business Partners involved in HR-related compliance case investigations participated in a training and upskilling program to equip them with enhanced employee relations and investigation skills. In 2023, 30 (2022: 20) alleged cases of discrimination or harassment were reported via the compliance hotline and other channels, seven (2022: seven) of which were confirmed on our global reporting platform and appropriate action was taken.

Solid ranking in diversity, equity and inclusion indices

We continue making progress on integrating diversity, equity and inclusion within our business:

- We achieved a 100% score on the Corporate Equality Index (CEI) for the fifth consecutive year, and thus received the "Equality 100 Award".
- We scored sixth in the **German Diversity Index** 2023 published by BeyondGenderAgenda. The index reflects the transparency of diversity commitments made by DAX 40 German blue-chip companies in their annual and sustainability reports for 2022.
- We were awarded the Gold Seal in the Uhlala Group’s **Pride Index** 2023
- We were recognized as a Best Place to **Work for Disability Inclusion** by Disability:IN.
- In China, we were recognized as a Top 10 Employer in the "**2023 DEI Employer Awards**"

Health & safety

We take responsibility for the health and safety of our employees every day and do everything we can to safeguard them against accidents and work-related illnesses. To this end, we take measures to prevent health issues from arising in the first place.

Our approach to preventing accidents and promoting safety

We seek to promote the health of our employees and sustain their long-term performance ability, which in turn necessitates a safe workplace. We are therefore constantly working to further strengthen our **health and safety culture**.

The lost time injury rate (LTIR) is an important indicator used to gauge the success of our occupational safety efforts. It comprises all accidents worldwide that have resulted in at least one day of missed work per one million hours worked. We determine the Group-wide LTIR both for our employees and supervised temporary staff. Our objective is to lower the LTIR to below 1.0 by 2025.

Generally, before starting any activity, we perform a **hazard assessment** to identify risks and do everything possible to eliminate them before commencing the activity or commissioning a plant. If this is not feasible, we put measures in place to minimize the likelihood of risks and their potential impacts. Hazard assessments are the responsibility of our individual sites and are therefore conducted by them.

In October 2023, we launched **BeHealthy**, our global employee health strategy, to our workforce. It is designed to further strengthen the physical, mental, social, and workplace health of our employees. All sites are asked to appoint a person responsible for implementing the strategy. For the launch of BeHealthy, we started an information campaign with the support of a member of the Executive Board. Moreover, in 2023, we introduced a key indicator for health, planned to comprise our health index on the one hand and the implementation status of the BeHealthy strategy on the other hand. We determine the health index based on 12 questions in the global Employee Engagement Survey. We measure the implementation status based on the extent to which our employees use the offers in the **BeHealthy Toolbox** and participate in the Mindfulness Community.

Through the efforts of our **Health Management unit**, we are bolstering our company and health culture at our global headquarters in Darmstadt, Germany. We examine the effectiveness of Health Management using a **key indicator system**, based on local activities.

Moreover, Health Management at our Darmstadt site also makes use of the findings from our company insurance fund’s health report, along with evaluations from our Site Medical Center. We use all of this input to create target group-specific or unit-specific **prevention programs** as well as to advise the local management. When specific indicators such as workplace stress start rising, additional consultation meetings take place between Health Management and the affected units.

Roles and responsibilities

Our Health and Safety management system is the responsibility of Corporate Sustainability, Quality and Trade Compliance, which in turn reports to the Chair of the Executive Board. This Group function sets objectives,

oversees the respective initiatives globally and conducts internal EHS audits. **Local EHS managers** and their teams ensure that our individual sites comply with all occupational health and safety laws and regulations. They are also responsible for local projects, campaigns, and programs.

Employees concerned about their health or safety are permitted to temporarily step back from their work until the issue has been resolved. Globally, across the Group, they are encouraged to report such concerns via our **compliance hotline**.

At our Darmstadt site, we have safety and decision-making committees that convene to address health and safety issues, coordinating strategies and focus areas with site senior leaders and health and safety experts as well as employees. Moreover, Health Management at the Darmstadt site contributes to embedding the topic of health into our company culture. After implementing each measure, the Health Management team asks all participants for their anonymous feedback on their experience and suggestions for improvement, which help shape the development of further initiatives.

At the Darmstadt site, our **interdisciplinary Mental Health Team** provides consultations to tackle the growing challenges surrounding mental health. As part of the new BeHealthy strategy, employees can also get support from mindfulness coaches on everyday stress management.

In 2023, we developed the interactive “Healthy leadership” workshop, among other things. The objective of this workshop is to familiarize our managers with health-promoting leadership behaviors with the help of business actors. At the same time, it teaches them how to integrate these behaviors into their own everyday work. In 2023, over 300 managers attended the workshop in Darmstadt.

In addition to this service, we offer a telephone hotline in all 66 countries in which we operate, giving our employees and their relatives access to confidential mental health and social counseling services around the clock.

Safety delegates and health partners

We have **safety delegates** at many of our sites globally who, in addition to their usual duties, help their supervisors ensure compliance with safety regulations and requirements. At the same time, they act as points of contact for their colleagues regarding safety-related matters.

At our Darmstadt site as well as other German sites, **health partners** also act as the interface between our employees and Health Management. They function as a health-related liaison for colleagues while also informing our workforce about the health programs and services on offer. At the same time, they make recommendations to Health Management regarding employee needs. Our employees undergo corresponding training before taking up their role as a safety delegate or health partner.

Our commitment: Policies and company agreements

Our Corporate **EHS Policy** (Corporate Environment, Health and Safety Policy) describes our fundamental approach to occupational health and safety, among other things. It is part of our **EHS management system** and undergoes an external ISO 45001 audit every year.

Together with the Group-wide health strategy BeHealthy, we launched the newly developed **Merck Group Employee Health Standard** in October 2023. It describes the fundamental requirements that a site must fulfill as regards employee health. In addition, the standard specifies our approach to ensuring workplace safety for our employees while also promoting their health and well-being. Furthermore, we set out our **Group-wide approach to health and safety management**, which is aimed at preventing workplace accidents and occupational illnesses.

We expect our contractors to comply with environmental as well as health and safety requirements throughout the entire process, from starting a job to completion. This objective is reflected in our Group-wide **Contractor EHS Management Standard**.

At our sites in Germany, we abide by **company agreements** on occupational health and safety that have been drawn up in partnership with employee representatives. For instance, our Occupational Integration Management works agreement, which applies to all our sites in Germany, governs the procedure for employees who have been on extended sick leave. The aim is to retain an employee's position while also helping to prevent adverse health impacts after the affected employee returns to work.

We also have occupational health and safety company agreements in place at 13 other sites in Europe. These cover all activities required to comply with national occupational safety regulations, such as workplace hazard assessments and regular occupational safety analyses. These company agreements also include on-site health offers for our employees.

Safety certification at our sites

As part of a **Group certificate**, our occupational health and safety management system was ISO 45001-certified at 66 sites at the end of 2023. The sites individually define the scope of their certification. For example, at the Darmstadt site, the ISO 45001 certificate covers employees in the production units as well as those working in infrastructure.

Our globally integrated management system enables us to ensure the occupational health and safety of all employees, among other things. This also applies to employees working at non-certified sites as well as those working at sites that are not included in the scope of the Group certificate.

The certification process helps us to identify weaknesses as well as opportunities for improvement, enabling us to take appropriate measures in a timely manner in order to ensure the health and safety of our employees in the future. All sites are urged to apply these standards.

Accident rates

Our employees are required to immediately report any relevant occupational accidents to Corporate Sustainability, Quality and Trade Compliance, where these accidents are assessed. If necessary, we then implement additional safety measures. This procedure is common practice across all production facilities around the world.

We document the following occupational safety data across our sites worldwide:

- The LTIR measures the accidents resulting in at least one day of missed work per one million hours worked. In comparison with the previous year, our LTIR increased slightly to 1.3 (2022: 1.2) The majority of incidents resulting in lost time were slips, trips and falls, along with contusions and lacerations from the operation of machinery and equipment. Once more, in 2023, we recorded no fatal accidents.
- We use our **EHS Incident Rate** to document **incidents**.
- Alongside this indicator, in the United States, we also use the **Occupational Illness Rate** to monitor work-related illnesses and their long-term effects.

Clear rules of conduct

Experience shows that most workplace accidents can be prevented by proper conduct. For our occupational health and safety, it is therefore essential that our employees receive EHS training and certification and act accordingly. We not only inform our employees about occupational health and safety but also actively involve them in our efforts; for instance, we ask them to participate in walkabouts and in the selection of personal protective equipment. This involvement is crucial as our employees best understand what they need in specific work situations. This enables us to continuously improve our occupational health and safety practices and performance.

Group-wide, all newly appointed site EHS managers must complete an **EHS onboarding training** that covers the topics of occupational health and safety as well as our **BeSafe safety culture program**. Through the BeSafe program, we raise employee awareness of occupational hazards and teach them rules for safe behavior. In addition, we regularly provide occupational safety training at our sites covering both legal requirements and the specific risks.

Promoting employee health

Our global health strategy BeHealthy comprises the following core elements:

- Mandatory training for all managers to promote **healthy leadership**;
- **Mindfulness** ambassadors who offer employees in their unit monthly or quarterly mindfulness exercises and provide support for managing stress;
- **BeHealthy Toolbox** with various health-promoting offers, such as training sessions, campaigns, self-tests, risk analyses, checklists, and consultations regarding mental, physical, social and workplace health (e.g., healthy shift work, ergonomics, 24/7 Employee Assistance Program).

In addition, numerous health-related offerings are available at our global headquarters in Darmstadt. These cover various topics including ergonomics, nutrition, stress, and mental health issues. We also offer employees at other sites various health-promoting measures.

Fitness initiatives

Across Germany, our employees can take advantage of offerings such as our company fitness program **Fit@Merck**, which encompasses **disease prevention courses** that are subsidized by our company. Additionally, in Darmstadt we have a company sports program with 31 athletic activities, of which we were able to offer 30 different athletic activities in 2023.

Physicals and support for our employees

With our occupational health care as well as our **recruitment and suitability examinations** we would like to ensure that all employees meet the health requirements for their particular tasks.

Our Travel Health & Medical Advisory Service assists employees who travel abroad, providing them with recommendations on necessary vaccinations and advice on hygiene risks.

ENVIRONMENT

162 Environmental protection

166 Climate action

172 Resource efficiency

- **172** Water management
- **176** Waste & recycling

179 Plant, process & transport safety

Environmental protection

Our business activities release emissions into the air and water and generate wastewater and waste. In addition, we use materials that can adversely affect the environment if not handled properly. We aim to minimize our impact on the environment and have developed strategies to improve our environmental performance. This includes making the most efficient use of increasingly scarce resources.

Our approach to environmental protection

Minimizing negative environmental impacts and taking meaningful climate action require a holistic approach while also constantly monitoring practices and performance. Our goal is to decouple business growth from negative environmental impacts wherever possible. Our production sites are located in established industrial and commercial zones. Before acquiring a company – and thus its facilities – we first conduct an environmental risk assessment.

Roles and responsibilities

The Chair of the Executive Board and CEO of our company is responsible for environmental protection, which also covers climate action, water management, waste and recycling, air emissions, biodiversity, and plant and process safety. Her duties include approving overarching Group-wide guidelines such as our Environment, Health and Safety (EHS) Policy. Furthermore, the Merck Sustainability Board (MSB) monitors the Group-wide implementation of environmental protection goals.

The Group function Corporate Sustainability, Quality and Trade Compliance (SQ) is responsible for steering all the related measures globally. SQ senior leadership approves operational standards and regularly reports on environmental protection to the Merck Sustainability Board. Every year, SQ prepares a comprehensive environment, health and safety report covering topics such as climate action, water management and waste and recycling as well as plant and process safety. The Merck Sustainability Board uses this report to steer the strategic direction and provide verification for our ISO 14001 and ISO 45001 certifications.

At our individual sites, each site director is responsible for environmental compliance as well as occupational health and safety at the operational level. At larger facilities, the site directors receive support and advice from EHS managers, with EHS coordinators performing this role at smaller sites. These local EHS units report to the corresponding business sectors, working in close collaboration with them.

Across our business sectors, the Operations Leadership Committee (OLC) makes strategic decisions on issues pertaining to **emissions**, **energy**, **water**, and **waste**. This body comprises representatives from Life Science, Healthcare and Electronics as well as SQ. Decisions made by the OLC and any resulting actions are implemented by the respective business sector. Once per quarter, the OLC members update their leaders on matters relating to environmental protection and this information, if relevant, is then shared with the Merck Sustainability Board.

Our commitment: Standards and standard operating procedure

Our approach to environmental management is founded on our **Group EHS (Environment, Health and Safety) Policy**, which has been approved by our Executive Board. Aligned with the requirements of the chemical industry's **Responsible Care® Global Charter** and the ISO 14001 environmental management standard, this policy underscores our leaders' responsibility for environmental protection and **health and safety**. It is also aimed at our **suppliers**, calling on them to likewise adopt high environmental sustainability and safety standards. Our EHS policy thus complements the **Supplier Code of Conduct** of our Group Procurement function. Through our Contractor EHS Management Standard, we aim to ensure that our contract partners also take environment, health and safety aspects into account.

Internal guidelines, standards and standard operating procedures define how we put the principles of our EHS Policy into practice, **structure our environmental protection efforts and implement occupational safety Group-wide**. In addition, we have in place a number of further internal environmental protection standards such as our **Air Emissions Standard**, **Waste Management Standard**, **Sustainable Water Management Standards**, and **Energy Management Standard**.

Material investments in environmental impact mitigation

Efforts to prevent and monitor air, water and soil emissions entail significant expense on our part, as does proper waste disposal. Moreover, we set up provisions for groundwater and soil remediation to ensure that we can execute all the necessary measures. As of December 31, 2022, our provisions for environmental protection totaled € 149 million (2022: € 148 million), 96% (2022: 94%) of which was attributable to Merck KGaA, Darmstadt, Germany. For details see consolidated financial statements under "**Other provisions**".

Assessing environmental impacts

As a matter of principle, we conduct risk-based assessments along with audits of all our production facilities every three years with the goal of analyzing and minimizing our environmental footprint. Conducted by SQ, these assessments serve to ensure that our requirements are being met, with appropriate corrective measures being implemented as needed. In our Group EHS audits, we assess our sites' performance on a five-tier scale ("excellent", "good", "fair", "poor", and "critical"), which in turn determines how frequently audits are conducted. If the findings are deemed to be good, we audit the facility less often, while incompliances can increase the frequency. In 2023, we commissioned **a total of 34 audits** (2022: 41), one of them "excellent", 23 of them "good" and 10 of them "fair".

For large-scale investment projects, SQ provides the EHS expert statement, which is a high-level summary of remaining EHS risks known at the time of project approval. This EHS expert statement integrates input from our sites and covers, for instance, occupational health & safety aspects, process safety requirements, fire safety and protection measures as well as environmental aspects.

Reporting incidents and violations

To review critical situations, near misses and environmental incidents as quickly as possible and take countermeasures, we have a set of **reporting procedures** in place that allow us to track the respective incident, its degree of severity and all risk mitigation efforts. We record all incidents Group-wide and report them to the Executive Board annually.

In the event of a major occurrence, our digital **Rapid Incident Report System** (RIRS) promptly notifies the SQ and Group Communications functions, which, if necessary, inform the Executive Board. Major incidents could include fatalities, accidents with multiple casualties, incidents that impact neighboring communities, or natural disasters such as earthquakes and flooding. Through the RIRS, we can quickly coordinate with all those involved and inform the other sites immediately of the respective event. In addition, employees as well as external stakeholders can report any violations of our standards to Group Compliance.

In 2023, we recorded no (2022: two) significant incident-related releases of substances.

Environmental training and continuing education

In 2023, we changed our overall approach for training new EHS managers. Eight times a year, we now offer comprehensive virtual live training courses. The seminars cover **energy efficiency and climate action**, **water management**, **occupational safety**, and **process and plant safety** along with our Rapid Incident Report System (RIRS).

ISO 14001:2015 Group certificate

Since 2009, our company has held an ISO 14001 Group certificate that requires all production sites with more than 50 employees to implement an **environmental management system with predefined indicators** such as greenhouse gas emissions and water consumption. Other facilities are not obligated to undergo certification. The annual internal audit reports and management reviews carried out under the Group certificate give us a better overview of how all our sites are performing. As in the previous year, 95 of our sites worldwide were covered by the **ISO 14001** certificate in 2023.

Annual external audits are used to monitor our certifications. As part of a defined sample procedure for the Group certificate, a total of 34 sites were externally audited in 2023, with all audited facilities passing (2022: 12). In addition to external inspections, internal audits serve to ensure Group-wide compliance with our requirements.

Biodiversity at our sites

Our initial step towards the goal of protecting biodiversity involves meticulous assessment of our production sites, recognizing them as primary contributors to our ecological impact. These sites grapple with issues such as soil sealing, emissions, waste generation, and water consumption. To gain a comprehensive understanding of our sites' impacts on biodiversity, we have developed Biodiversity Site Profiles using data sourced from the Integrated Biodiversity Assessment Tool (IBAT). This foundation enables us to conduct a thorough quantitative analysis of biodiversity. Consequently, Merck production sites can be systematically compared, enabling us to prioritize initiatives aimed at biodiversity conservation.

In the forthcoming periods, we are dedicated to further refining our site profiles and actively promoting positive biodiversity outcomes across our sites.

Climate action

Climate change is one of the major challenges facing society in the 21st century. In 2015, the United Nations collectively agreed to take action to significantly limit the rise in global temperatures. Since climate action and energy efficiency will pay off in the long run – both for the environment and our business – we have also made it our mission to help stem the tide of climate change.

How we are taking climate action

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 the basis year 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 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. This approval by SBTi confirms that 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% compared with 2020 (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.

Roles and responsibilities

Corporate Sustainability, Quality and Trade Compliance is responsible for overseeing all climate action efforts throughout the Group, with our individual sites and business sectors worldwide implementing the necessary measures at the local level. More information can be found under **Environmental Protection**.

Our commitment: Standards and legal frameworks

We have three EHS standards in place to manage energy and process-related emissions consistently across the Group, specifically “Energy Management”, “Air Emissions” and “Emissions of Refrigerants”. We use an internal audit process to randomly check compliance with all EHS standards.

In addition to our own standards, **we are subject to a wide array of national and international energy and climate regulations**. At European level, for instance, we are required to comply with the EU Energy Efficiency Directive (2012/27/EU), which stipulates that companies must conduct regular energy audits or implement an ISO 50001-certified energy management system. The sites subject to these requirements are responsible for taking the requisite actions and furthermore undergo audits conducted by internal and external experts. In total, 14 sites have been certified in accordance with ISO 50001 to date.

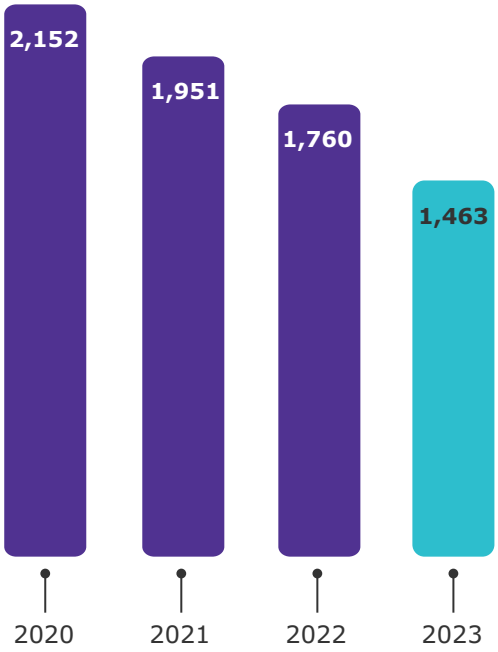
Our co-generation plant in Darmstadt and heating plant in Gernsheim (both in Germany) have made it necessary for us to participate in **EU emissions trading** since 2005. The EU 2030 Climate and Energy Framework is designed to achieve the objectives of the Paris Agreement, with EU emissions trading playing a key role in this. The amended EU Emissions Trading Directive (2003/87/EC) took effect in April 2018, thereby updating the legal framework for the fourth phase of the EU emissions trading program (2021-2030) and tightening the rules for free CO_2 allowances. Going forward, we will therefore increasingly have to purchase CO^2 emission allowances.

Emissions reduced further

In 2023, we reduced our greenhouse gas emissions by nearly 17% compared with the previous year, emitting a total of approximately 1,463,000 metric tons of **CO_2 equivalents** (CO_2eq) (2022: 1,760,000).

Our direct emissions (Scope 1) totaled 1,236,000 metric tons of CO_2eq (2022: 1,518,000), with process-related emissions accounting for 990,000 metric tons of CO_2eq and fuel use accounting for the remainder. Indirect emissions (Scope 2) totaled roughly 227,000 metric tons of CO_2eq (2022: 242,000) calculated according to the **market-based method** (approximately 381,000 metric tons of CO_2eq according to the **location-based method**). Greenhouse gas emission intensity (Scope 1 and 2) amounted to 0.07 Kg of CO_2eq per € of net sales in this period (2022: 0.08).

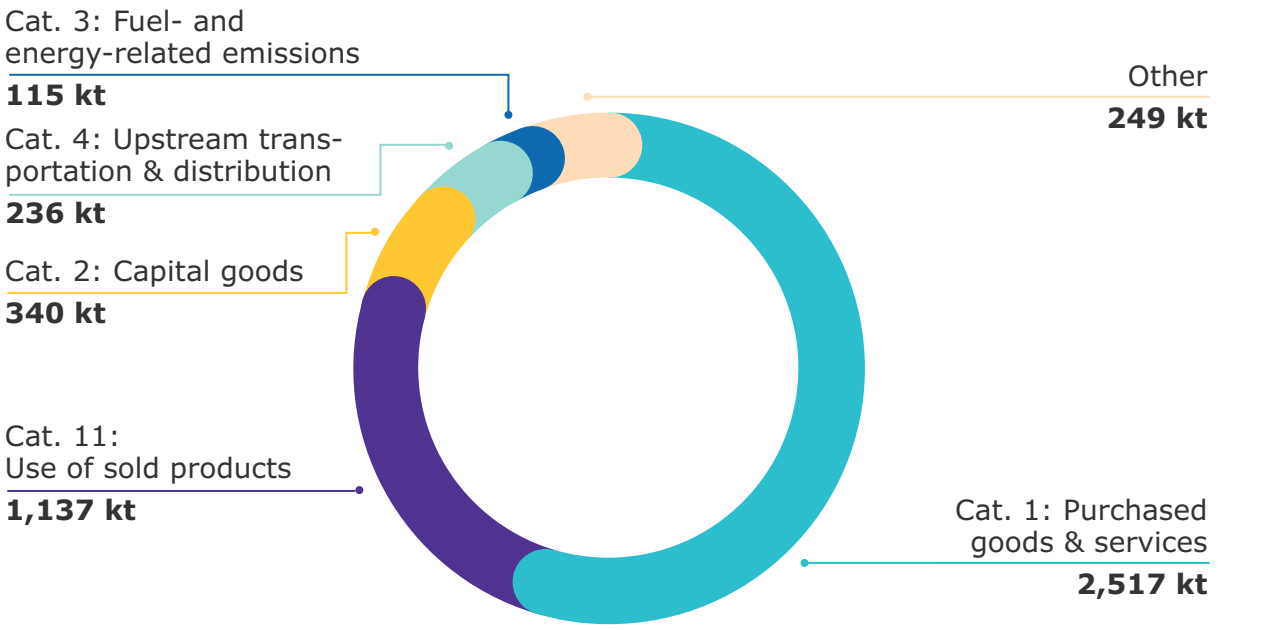
Greenhouse gas emissions in metric kilotons of CO_2 equivalents, Scope 1 and 2[1]



The Greenhouse Gas Protocol defines 15 categories for Scope 3 emissions from upstream and downstream activities. In 2023, these emissions totaled around 4,594,000 metric tons of CO_2eq (2022: 6,680,000). Categories 1 and 2 (Purchased Goods and Services and Capital Goods) accounted for 62% (2022: 69%) of our total Scope 3 emissions in this period.

We currently calculate the majority of emissions based on "spend" data, with inflation causing an increase in emissions using this method. Our gradual plan involves shifting to a hybrid calculation of spend- and weight-based calculations and continue increasing share of primary data from our suppliers. More information on the Supplier Decarbonization Program can be found under **Sustainable supply chain**.

Greenhouse gas emissions 2023 in metric kilotons of CO_2 equivalents, Scope 3



Reducing process-related emissions

Within our Electronic business, a key area of focus is mitigating Scope 1 emissions, primarily stemming from the production of specialized chemicals crucial to the electronics industry. Our previously commissioned pilot exhaust gas abatement unit in Hometown, Pennsylvania, USA, has demonstrated high efficiency of almost 99%. In 2023, we began planning to expand this technology to two sites that produce these chemicals. Once completed, this expansion will significantly reduce our process-related emissions in our Electronics business sector.

In our Life Science business sector, we are tracking process-related emissions primarily from the release of perfluorinated hydrocarbons (PFCs). Consequently, we replaced several emission-intensive production lines with equipment that does not emit PFCs, resulting in a reduction of CO_2eq by 11,795 metric tons in 2023. We also continued developing methods to eliminate the remaining PCF emissions from these processes, which we plan to implement before 2030.

Reducing product-related emissions

We are working to reduce the carbon footprint of our products across all three of our business sectors. In 2023, we successfully completed a pilot project for an IT tool designed to calculate the carbon footprint of our product

portfolios; one product family per business was used to evaluate the feasibility of the solution. This tool enables us to calculate and assign emissions at various steps of the product life cycle, from procuring raw materials to transport and processing, culminating in the finished product. Following the pilot, we have expanded this carbon footprint assessment to further products in our portfolios. To ensure we meet industry standards and use comparable data analytics and expert analysis, we collaborate in industry initiatives with our peer companies, including Together for Sustainability (**TfS**).

Reducing emissions within our supply chain

You can find more information on the Supplier Decarbonization Program under **Sustainable supply chain**.

Shifting to ocean freight

Building on the progress made with air-to-sea conversion of our Healthcare logistics routes, our Life Science business sector launched its global Mode Shift program in 2023 to transition from air to sea freight shipments where feasible. The rollout is continuing across our Life Science operations as a major decarbonization lever.

Evaluating investments for sustainability

In 2023, we again performed sustainability evaluations on all investment projects worth more than € 10 million. The shadow price that must be considered for these investment projects is € 100 per metric ton of CO_2eq. With these measures, we aim to establish a clear focus on reducing CO_2 emissions in all our large capital expenditure projects.

Transparency on CO_2 emissions and energy consumption

We report to **CDP** on an annual basis. This organization assesses the ways in which companies are working to lower greenhouse gas emissions and minimize the risks and consequences of climate change, along with their strategy for doing so. Companies are rated from A to D-, with A being the top score. In 2023, we scored A- (2022: B) for climate change

Climate-related risks and opportunities

In order to comply with all disclosure requirements of the **Task Force on Climate-Related Financial Disclosure (TCFD)**, we started with a detailed assessment of climate-related risks and opportunities. In 2022, we conducted our first analysis of qualitative climate scenarios and in 2023 we enriched our initial findings with a quantitative analysis. More information can be found under **TCFD reporting**.

Energy efficiency

In 2023, a variety of **energy efficiency initiatives** helped us save around 2,800 metric tons of CO_2eq at our global headquarters in Darmstadt (2022: 3,000). For instance, we improved heating, ventilation and air conditioning systems and reduced base loads for compressed air systems.

Slight decline in energy consumption

We consumed 2,337 gigawatt hours of energy in 2023 compared with 2,432 gigawatt hours in 2022. As in the previous year, our energy intensity relative to sales remained at 0.11 kWh/€ in 2023.

Renewable Energy

In 2023, we further strengthened our focus on purchasing electricity from renewable sources. In this period, we sourced 51% of our purchased **electricity from renewable energies**, meaning direct supply contracts and energy attribute certificates (2022: 47%). The share of our total energy consumption by renewable energies increased to 23% in 2023 (2022: 20%).

In 2023, we signed virtual power purchase agreements (VPPAs) in Europe for a total of around 300 gigawatt hours (GWh) of renewable energy per year. This means that 100% of our electricity currently purchased in the European Union (EU) and Switzerland will be covered with renewable energy certificates as of 2025.

Our Life Science business sector addresses energy efficiency at our sites through its EDISON Program for energy and water efficiency, investing approximately € 10 million annually until 2030. For example, heat pumps were installed in 2023 at two buildings at our site in Molsheim, France, to reduce its dependency on natural gas.

At our site in Toluca, Mexico, we have also installed our first solar panels across our operations in Mexico. The 550 kW system is expected to account for almost 70% of the site's annual energy consumption, and avoid approximately 170 metric tons of CO_2 annually. In addition, we have set up solar parks at other sites in the network, for example in Mollet, Spain, which will generate up to 2,800 MWh hours per year of green electricity.

Furthermore, we are covering the power needs of multiple South American sites (for example in Argentina, Chile and Guatemala) through renewable energy certificates. The same applies to several of our sites in China. In order to advance the decarbonization of our own business operations and our supply chain, we have joined the Energize industry network as a sponsor. Details can be found in the **Supply Chain Management chapter**.

Employee incentives

We encourage our people to do their part to preserve the climate by providing helpful information and tips on our intranet. We consistently provide updates on company-wide climate protection initiatives within our internal sustainable network, which serves as a dedicated platform where employees who are passionate about sustainability convene regularly to exchange ideas and deepen their understanding of pertinent topics. Moreover, we support members of our workforce who are seeking greener modes of living:

- At our German subsidiaries, we offer a subsidy of € 150 towards monthly lease payments to employees who opt for an **electric company car**.
- For those on the road, we offer the "Laden@road" program, which enables our employees to charge their company or private cars at approximately 100,000 stations across Europe. Our approach includes helping employees switch to electric vehicles by providing charging facilities at various sites, for instance in Germany, France, Switzerland, the United Kingdom, and the United States.

- At our German sites, we also encourage employees to use climate-friendly forms of transportation through “bike4me”, a program enabling them to **lease a bike** at discounted rates with payments being deducted from their pre-tax income.
- German employees are also eligible to receive a Deutschland-ticket subsidy of € 10 per month to travel using regional and local public transportation.
- 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.

Resource efficiency

Water management

Water is becoming increasingly scarce globally. Since our company also depends on the availability of water, sustainable water management is an important part of our environmental protection efforts. Our wastewater may also contain trace substances, such as pharmaceutical active ingredient residues. We continuously aim to improve our water protection activities. This includes adapting our practices to increasingly strict legal requirements.

Our approach to sustainable water management

To us, sustainable water management means obtaining freshwater or discharging treated wastewater without negatively impacting aquatic ecosystems. We are also concerned with addressing water scarcity. To determine whether a site is in a water-stressed area, we apply a risk factor of the Aqueduct Water Risk Atlas of the World Resources Institute (**WRI**). We want to reduce the environmental impact of our wastewater and make our processes more water efficient. In the medium term, we will also consider water-related risks in our supply chain when purchasing important raw materials. In the long term, we aim to transparently map water use and environmental impacts throughout the entire life cycle of our products.

To this end, we have defined two targets: Firstly, we originally aimed to achieve a 10% reduction in our **Merck Water Intensity Score** by 2025 compared with the baseline of 2020. In 2023, we met and surpassed this target, successfully lowering the Merck Water Intensity Score by 25%. Consequently, we have set a new target based on a new and more transparent calculation. By 2030, we strive to achieve a 50% reduction in our water efficiency ratio of water intake per revenues compared with the 2020 baseline. The new target covers the complete water intake of our company. Our 2020 baseline year was chosen to align this new target with other existing environmental goals.

Our second objective focuses on mitigating our environmental impact. Specifically, we are committed to reducing potentially harmful residues in our wastewater to levels below the established no-effect threshold.

Our regular **EHS audits** at our production and development facilities also review **site-specific water management practices**. Our water management efforts focus more heavily on our manufacturing sites than our administrative facilities as production generally poses a higher risk to aquatic ecosystems.

Roles and responsibilities

The Group function Corporate Sustainability, Quality and Trade Compliance is responsible for water management. At our sites, engineers work closely with our EHS managers to reduce water use and treat wastewater. Further information can be found under **Environmental protection**.

Our commitment: Standards and procedures

Our **Sustainable water management principles** set the framework for three Group-wide standards that detail how we integrate mechanisms of sustainable water management into our management system: Sustainable Water Management Part 1 – Wastewater; Sustainable Water Management Part 2 – Water Use; and

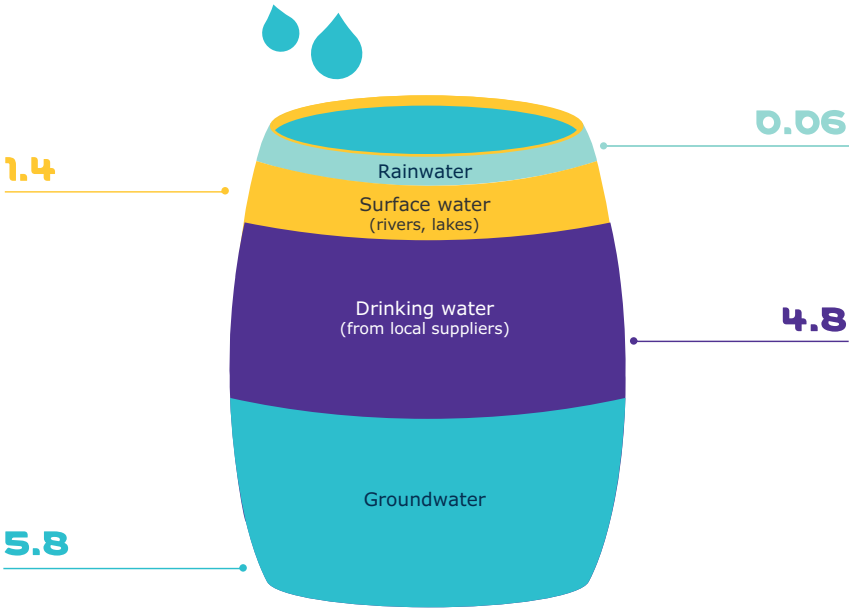
Sustainable Management Part 3 – Water Risk Management. All three standards are based on the commitments we made under the **Responsible Care®** initiative.

Our Wastewater Standard defines criteria for assessing our wastewater discharges into ecosystems. It also helps us achieve our targets regarding trace substances in wastewater from our operations. The Water Use Standard sets out mandatory Group-wide requirements for the responsible use of water. The Water Risk Management standard establishes a way for us to manage the risks that arise from direct or indirect water extraction and covers risks such as contaminated rainwater and flooding. We perform internal **EHS audits** to verify that our sites comply with our three standards. All sites are required to measure and assess the risks and impacts of the hazardous substances in their wastewater. Moreover, they must also analyze withdrawal and wastewater risks and comply with the respective requirements of the local authorities.

Water withdrawals from our own wells and local suppliers

For the most part, we draw water used for our production processes from our own wells and source drinking water from local suppliers. In doing so, we do not want water extraction to impair any protected areas, sensitive ecosystems or habitats. We extract less water from our own wells than the amounts permitted. We simultaneously monitor potential trends that could lead to the reclassification of water sources, which involves assigning heightened levels of protection to specific regions.

Water withdrawals (millions of m^3) – 2023



The cooling water used in our production processes generally runs in a circular system. Depending on regulatory standards and the energy footprint, we sometimes use freshwater for cooling in a once-through system. However, this is only done in regions with high freshwater availability. For certain applications, we treat production wastewater and reuse it. In 2023, we recycled a total of 20.5 million m^3 of water (2022: 20.7).

Using water more efficiently

We seek to minimize our impact on water availability in the vicinity of our sites. In 2023, we withdrew 12.1 million m^3 of water in total (2022: 13.2). We assess local conditions to determine whether a sufficient water supply is available. In our water conservation efforts, we pay particular attention to sites in water-scarce areas. To measure how we improve our water efficiency, we have defined the Merck Water Intensity Score, which relates the amount of water either purchased or withdrawn from our own wells at a site to the number of hours worked, taking local water availability into account. In 2023, we already exceeded our target set for 2025 to lower the Merck Water Intensity Score by 10% (baseline year 2020). Initiatives that helped us reach our original goal include effects from shifts in product mix as well as initiatives such as recycling of wastewater in Rio de Janeiro (Brazil), St. Louis (USA) and Mollet del Valles (Spain).

We have therefore set ourselves a new target: By 2030 we will reduce our sales-normalized water intake by 50% compared with 2020 (2020: 792 m^3 per million € net sales (100%), 2023: 580 m^3 per million € net sales (-30%)).

In the past, our Gernsheim site in Germany was excluded from both the score and our water conservation efforts because we must extract a minimum water quantity from our own wells to meet regulatory requirements. Our new target will cover the entire Group, including Gernsheim.

Our site in Mollet (Spain) is one example of how we mitigate the risk of water scarcity in local communities. In Mollet, have we invested in multiple projects such as retrofitting pumps for water circulation, reusing water for cooling and changing to dry technology dedusters. This has reduced our absolute water intake in Mollet by around 20% since 2018.

Our wastewater

In 2023, we generated a total of 11.1 million m^3 of wastewater (2022: 12.4). This comprised around 7.6 million m^3 of “direct discharge” water (2022: 8.6) into surface waters. 3.4 million m^3 was classified as “indirect discharge” (2022: 3.8) water and treated at external treatment plants. We take extensive measures to ensure that we comply with respective legal requirements when directly discharging wastewater into aquatic ecosystems. Before we obtain a discharge permit, the local authorities review the profile of the local aquatic ecosystems on site to ensure they will not be compromised by our activities.

In 2023, 53% of our total wastewater was discharged by three of our sites. Our Gernsheim site in Germany discharges its treated wastewater into the Rhine River, and our Onahama site in Japan into the Pacific Ocean. The wastewater generated at our site in Darmstadt (Germany) is treated in our own treatment plants before being released into the Schwarzbach/Ried Creek, a tributary of the Rhine River. We are preparing for a potential tightening of the statutory requirements on discharging treated wastewater.

We have been expanding our central wastewater treatment plant in Darmstadt by adding a fourth purification stage. Its current treatment performance of up to 98% (2022: 98%) is to be further increased in the future thanks to activated carbon filters. We commissioned the improved plant at the end of 2023.

Residues in wastewater

We continuously work to optimize our production streams and purification processes to conserve water and minimize residues. We have appointed an expert for each of our business sectors to provide guidance for our sites. This approach aims to reduce the amount of **pharmaceutically active ingredient residues** as well as all substances with water-hazardous properties. All wastewater from relevant sites is processed in wastewater treatment plants before being discharged into the environment. This is done either in our own plants or by offsite third parties such as municipal wastewater treatment plants.

We also process antibiotic active ingredients on a small scale. To prevent adverse effects on people and the environment, the wastewater generated from these activities is strictly segregated and undergoes an additional purification process. Only then do we discharge it into the ecosystem, thereby minimizing remaining antibiotic residues.

When discharging wastewater, we strictly adhere to government regulations. However, even when meeting all applicable requirements, slight amounts of trace substances still end up in the ecosystem. Our target, therefore, goes beyond the stipulations of legal requirements: By 2030, we aim to reduce potentially harmful residues in our wastewater to below the no-effect threshold. To achieve this objective, we are executing a series of project steps. In 2023, we initiated risk assessments for pertinent substances at designated sites, evaluating deviations from the no-effect threshold and implementing corrective measures. Notably, eight out of the 79 sites under consideration, have established that concentrations of all water-hazardous substances in their effluents are below the no-effect threshold. The remaining sites are currently in the assessment phase, evaluating the impact of their effluents.

Assessing our water management practices

In addition to reporting on our **climate action efforts**, we also report water-related data to the **CDP**, which collects environmental data from companies once a year and evaluates their processes and performance on a scale from A to D-. As in the previous year, we were awarded a B for our water management practices in 2023.

Waste & recycling

Although waste may contain valuable raw materials that can be reused in the production stream, it can also pose a wide range of risks to the environment. We therefore consider it essential to either prevent or recycle as much of our waste as possible.

Our approach to waste and recycling

We strive to prevent waste as far as possible by, for instance, developing new production processes or optimizing existing ones. When prevention is not feasible, we aim to recover materials or energy from the waste we generate. Waste separation makes it possible to **recover and recycle raw materials**, while unrecyclable waste is disposed of in an environmentally sustainable manner in line with waste disposal standards. In doing so, we take local legal regulations as well as the available disposal options into account.

We aim to limit the loss of raw materials and reduce the impact our waste disposal practices have on ecosystems. In 2023, we achieved our previous goal of lowering our Waste Score, our key waste management indicator, by 5% by 2025 (against a 2016 baseline). As we achieved this goal ahead of schedule, we have set ourselves a new ambitious new goal: By 2030, we aim to achieve a circularity rate of 70% across the entire Group (2023: 68%).

Responsibility for the waste disposal process

As a generator of waste, we are responsible for the ultimate disposal of our waste and therefore choose our service providers with the utmost care, contractually stipulating disposal requirements. We conduct random audits to verify their compliance with our disposal standards, especially when it comes to hazardous waste.

Roles and responsibilities

Our Corporate Sustainability, Quality and Trade Compliance (SQ) function bears overall responsibility for our waste management and recycling practices. Additionally, our site EHS managers are responsible for implementing our requirements at the sites and for maintaining legal compliance with the applicable regulations. We have a Group-wide committee consisting of experts from SQ and our business sectors to coordinate our approach to waste management.

Waste management forms part of our Group-wide environmental management system, with 95 sites (2022: 95) certified to ISO 14001. In addition to undergoing external certification, we also conduct internal EHS audits to review our waste management practices. Moreover, we regularly host activities such as EHS calls (e.g. on circular economy) to keep our local EHS managers and site directors as well as other employees up-to-date on the topic and to raise awareness.

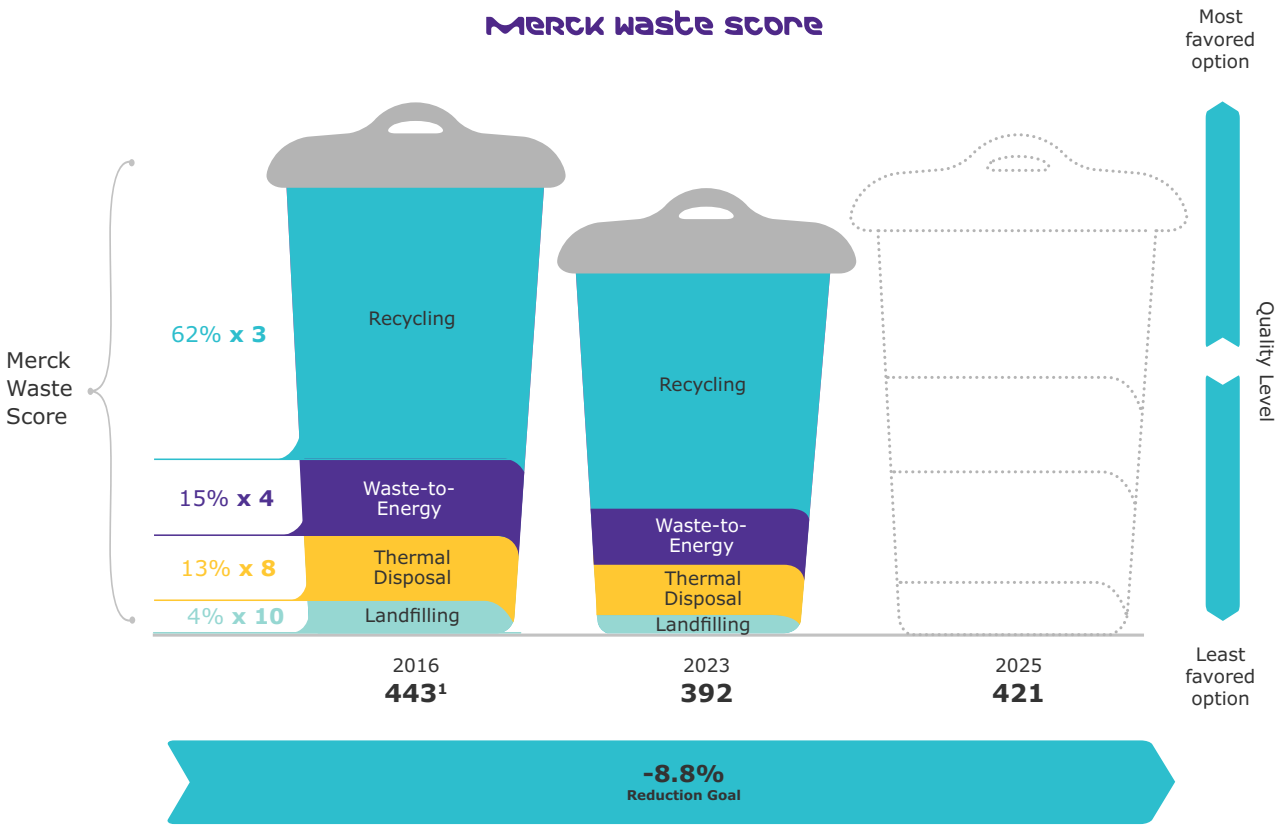
Further information can be found under **Environmental protection**.

Our commitment: International guidelines and requirements

Our Group-wide **EHS** Waste Management Standard provides a **consistent framework for waste management across all our sites**, defining organizational structures and minimum requirements. This standard also stipulates that all facilities document their waste by type and quantity and report these data to our SQ function.

Systematic waste reduction

We use a variety of methods for recycling, recovering and disposing of the waste we generate, each of which has a different impact on the environment. To systematically account for these effects, we have put in place a waste scoring system that allows us to compare the amount of waste our individual sites generate and track our various waste streams. In this system, our waste streams are broken down into five categories by percentage: landfilling, thermal disposal, waste-to-energy, recycling, and prevention. This percentage is then multiplied by a factor that increases based on the disposal method's environmental impact. The total from each category is added together to yield our total Waste Score. Prevented waste is multiplied by a factor of zero, thus lowering the overall score.



1 The base was retroactively adjusted owing to subsequent data corrections.

Reducing the environmental impacts of waste

We continuously examine our production processes and disposal methods to identify potential areas for improvement, an endeavor supported by the EHS units of the business sectors at each site. They regularly discuss best practices, share lessons learned across our sites and drive the transition to greener disposal methods. Having surpassed our initial goal ahead of schedule, we have now set a more ambitious target for ourselves: By 2030, we aim to achieve a 70% circularity rate throughout the entire Group.

Our new waste goal is calculated as the sum of recycled and avoided waste divided by the total waste in metric tons. It is important to note that waste-to-energy is excluded from this calculation as it is not considered circular. The scope of measurement includes production waste but excludes one-time effects from specific waste

streams such as sludge from wastewater treatment facilities (subject to disposal restrictions by regulators), construction and demolition waste, and soil waste. All sites within the Group are included in this assessment.

The amount of waste we generated in 2023 decreased, totaling 291 metric kilotons (2022: 371 metric kilotons). Soil, construction and demolition waste accounted for 43% of our total waste in 2023 (2022: 53%). Our Waste Score as well as the circularity rate do not factor in this type of waste, which can rarely be avoided and must be disposed of in accordance with clearly prescribed methods.

Promoting circular economy

Through our ProMec (Progressive Material Economy) initiative at our Darmstadt site (Germany), we are promoting a **sustainable, resource-efficient circular economy**. We are refining our solvent recycling practices, thereby minimizing the adverse environmental impacts from the disposal of our production waste.

In 2023, together with the Technical University of Darmstadt (TU Darmstadt), we successfully completed the development of a **digital platform prototype for the optimum use of waste and its avoidance**. The project aimed to bring together waste generators and specialized waste recyclers for a secondary market. It will be established in the market under the name ‘Green Garnet’ within a start-up at TU Darmstadt.

At our site in Dallas, Texas (USA), we implemented a project that recycles plastic drums into rigid polyethylene (HDPE), which can be used for multiple new applications. During the reporting year, the site expanded this recycling process to include customer waste. More information can be found under **Sustainable Products**.

To give new life to equipment and materials that are no longer needed, we donate them to organizations such as universities. We also run internal exchange platforms for chemicals and equipment at some of our sites. In 2023, we donated 146.7 metric tons of material. We also partner with nonprofit organization Seeding Labs to donate equipment to under-resourced labs and universities around the world, totaling an additional 1.1 metric tons in 2023.

Additionally, we have actively engaged in a fertility pen take-back initiative in Denmark. We collect used pens from our patients with the aim of maximizing the amount of recycled content in new pens.

Shifting from landfill to waste-to-energy

At our site in St. Louis, Missouri (USA), we divert a vast proportion of our waste from landfill by employing waste-to-energy recovery. As of the end of 2023, this applied to 1,451 metric tons (2022: 1,310). Furthermore, the site is currently participating in a project to compose or reuse filter media in farming applications.

Plant, process & transport safety

Preventing harm to human health and the environment is one of our top priorities. We have management systems in place to help ensure the safety of our plants and processes and to protect our employees and the environment. In addition, we do everything in our power to ensure that our chemical and pharmaceutical compounds are transported and stored properly.

Our approach to plant, process and transport safety

We seek to **minimize manufacturing process hazards** wherever possible in order to prevent workplace accidents, production outages and chemical spills. To this end, we regularly review our approach to plant and process safety and continuously gauge it using our EHS key indicators.

Moreover, all our shipments are to reach our customers and sites safely, undamaged and with the required safety information. Several of the materials we store and transport are classified as hazardous. The storage of such dangerous goods and the transport thereof – whether by road, rail, air, or water – are governed by global regulations. To minimize risks to people and the environment, we apply **strict safety requirements across the Group** that also comply with applicable laws. We conduct regular reviews to ensure our own warehouses as well as those of third parties comply with these regulations.

We train our employees regularly in an effort to prevent human error and also to detect technical defects before they can cause harm.

Roles and responsibilities

Overriding responsibility for plant, process and transport safety lies with the Group function Corporate Sustainability, Quality and Trade Compliance (SQ), which coordinates plant and process safety for the company and defines Group-wide EHS standards and regulations. In addition, our individual sites are subject to national and international regulations governing environmental stewardship and public safety. At the local level, the **respective site directors** are responsible for ensuring compliance with all safety requirements.

As applicable, we have EHS managers for the relevant sites as well as **dangerous goods managers** for sites with logistics activities involving relevant amounts of hazardous materials. This role corresponds to the EU regulations pertaining to the “Dangerous Goods Safety Advisor”. Both individuals advise the site manager on plant, process and transport safety and regularly monitor compliance with safety requirements.

Our commitment: Internal standards and international rules

To ensure safe operation throughout the lifetime of a plant, our Group-wide EHS standards contain specific rules for production plants and processes. These include specifications that determine how special risk analyses and hazard assessments are to be carried out. We have also defined measures for the event of accidental release of chemical substances and for fire protection.

Our Group-wide EHS standards stipulate the safety levels for the storage of hazardous materials at our sites. Along with supplementary standard operating procedures and best practice documents, these EHS standards describe the technology, equipment and organizational infrastructure needed to achieve the appropriate safety

levels. Contract warehouses must also adhere to our strict safety requirements. Before we sign a contract with an operator, they must submit a statement detailing how they meet our prerequisites. Our Group-wide EHS standards also define **the technical and organizational requirements** for such warehouses.

Our Group Transport Safety Standard is based on the United Nations Recommendations on the Transport of Dangerous Goods. This guideline is especially important for sites in countries with inadequate local regulations covering the conveyance of hazardous materials.

Assessing potential risks

Before commissioning a plant, we draft a safety concept, which is subject to continuous review throughout the entire lifetime of the facility. It is updated as needed until the facility is decommissioned. This safety concept contains an overview of potential risks and specifies corresponding protective measures. In the event that alterations are made to a plant, we reassess the hazard and risk situation. Our Risk Management Process guides all our sites in **identifying and assessing risks** and serves to devise further measures to minimize them.

We use internal **EHS audits** to complement the inspections conducted by our EHS and dangerous goods managers in order to ensure that our sites comply with process, plant, transport, and storage safety regulations. Normally, these audits are conducted every three years at production sites and every four years at warehouse and distribution sites. If major shortcomings are identified, we re-audit the respective site the following year. Conversely, we may decide to extend the period between audits at facilities where, based on the findings from previous audits, we deem the potential risk to be low. Our sites are required to rectify any deficiencies discovered during the audit, with the auditor subsequently checking whether the specified corrective actions have been taken. In 2023, we conducted 34 EHS audits (2022: 41) in accordance with our Group-wide EHS standards.

We report transportation incidents and accidents in accordance with the recommendations on the Transport of Dangerous Goods – Model Regulations (UN Orange Book, 7.1.9) in conjunction with the criteria of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR, 1.8.5.). There were no reportable events in the reporting period.

Keeping a close eye on safety

We track **EHS performance indicators** at all production and warehouse facilities, as well as at major research sites, including both accidents and near misses. We investigate each individual incident and then devise appropriate countermeasures in an effort to reduce the likelihood of such events reoccurring in the future. EHS performance indicator data are reported once a month within each business sector, with the Executive Board receiving reports on the topic once per year. Four indicators are particularly important to us:

- Under our **EHS Incident Rate (EHS IR)**, we track and evaluate all major and minor accidents and incidents as well as further EHS-relevant incidents. The EHS IR covers both our own employees as well as those of contractors. To calculate it, we state the number of incidents and the severity of the event in relation to the number of hours worked. The lower the EHS Incident Rate, the safer the site is. In 2023, the ratio was 2.4 (2022: 2.8).
- The EHS IR also contains our **Loss of Primary Containment (LoPC)** indicator. In 2023, we did not record any significant incident-related releases of substances (2022: two).
- The EHS **Leading Rate (EHS LR)** reflects the number and the results of the analyses of near misses and hazardous conditions or behaviors, as well as other proactive safety activities such as risk assessments.
- For the **Lost Time Injury Rate (LTIR)** we set ourselves the goal of lowering our Group-wide LTIR to under 1.0 by 2025 (number of accidents Group-wide resulting in at least one missed day of work per million hours worked). In 2023, our LTIR was 1.3 (2022: 1.2).

Our EHS managers perform standardized audits at third-party warehouses and using a digital third-party audit reporting system. This approach helps us to more effectively identify areas for improvement at third-party warehouses and our interfaces, and better compare the third-party warehouses with each other and with our own warehouses.

Employee training and best-practice sharing

In line with their specific tasks and responsibilities, our employees undergo regular training that is conducted by either their respective supervisor or our EHS managers. They present Group-wide EHS standards as well as site-specific standards and processes, address changes to international requirements and explain the proper procedures for dealing with incidents. In addition, all newly hired EHS managers complete introductory courses on plant and process safety during their EHStart-up! onboarding.

In the interest of improving safety, we consider it extremely important to continuously **share best practices and lessons learned**. Once a month, for instance, site directors and EHS managers participate in safety leadership calls to learn from incidents at other facilities and implement preventive measures. Additionally, the EHS managers of the individual sites regularly hold lessons-learned sessions.

COMMUNITY

183 Community engagement

Community engagement

We see ourselves as part of society – both at our individual sites as well as worldwide. Our aspiration is to help shape society – through our products, technologies and community engagement. That is why we work with our employees to promote a diverse range of social initiatives that help tackle challenges at the local level.

Our approach to community engagement

Worldwide, we are deeply committed to supporting the communities in which our various sites are located. In this context, we focus on health, education and culture as well as environmental protection. Moreover, we provide disaster relief and offer support to people in need in the vicinity of our sites.

In particular, we advocate for improving **access to health** for people worldwide. We do this by getting involved in numerous healthcare projects and purposefully contributing our experience in healthcare.

We also **promote culture and science education**. This has a long tradition in our company. As a science and technology company, we champion creativity, the joy of discovery and curiosity as well as the courage to push boundaries.

Protecting the environment and using natural resources responsibly is a task for us all. Therefore, we support various initiatives around the world that help **raise environmental awareness**.

We regularly evaluate the achievement of objectives and the impact of our projects. Our analysis is based on the so-called **iooi method** (input – output – outcome – impact) developed by the Bertelsmann Foundation. In the first step, we measure our input based on the product or monetary donations made and the time our employees invest in volunteer projects, for instance. In the second step, we record the immediate output, for example the number of organized training programs that were made possible thanks to our financial donations. We are also interested in the impact achieved for the specific target group. Our goal is to ensure that our community engagement continues to have a positive impact on society. For this reason, we are constantly working to make the sustainable **impact of our projects (outcome and impact)** measurable for the respective target groups.

It is particularly important to us that our projects achieve a sustainable impact, which is why we mainly initiate projects that aim to improve specific social situations or solve societal problems. 82% of our project spending goes towards this. We also support short-term and one-time charitable activities as well as initiatives that are beneficial to our business (e.g. in recruiting staff) on the one hand and can also help the community on the other hand.

Together with partner organizations, we support many long-term projects and form **strategic partnerships**. This enables us to strengthen our relationship with various stakeholders and helps reinforce our social license to operate.

Roles and responsibilities

The Group function “Corporate Sustainability, Quality and Trade Compliance” sets the framework and records data on our Group-wide community engagement. The coordination of the **Deutsche Philharmonie Merck** is also among its responsibilities. The Global Health unit within the Healthcare business sector steers the Merck Schistosomiasis Elimination Program and the Global Pharma Health Fund (**GPHF**). Furthermore, the Global Strategic Partnership unit, which is also part of Healthcare, coordinates **Embracing Carers**. In addition, our business sectors are launching their own projects, such as the educational program **SPARK™**. Our subsidiaries abroad are independently responsible for deciding on local activities in a decentralized manner. Some of our health initiatives in low- and middle-income countries are included within the scope of the **Merck Foundation**.

The Merck family of entrepreneurs also has a long history of supporting charitable causes. Their activities are organized via the **Merck Family Foundation** and the Merck’sche Gesellschaft für Kunst und Wissenschaft e. V. (Merck Society for Art and Science).

Our commitment: The principles of our community engagement

In designing our projects, we are guided by our Group-wide “Group Standard on Community Engagement”, which defines what community engagement means for the entire Group and what objectives we are pursuing. This standard gives our business sectors and subsidiaries abroad a framework for structuring their respective activities themselves and also stipulates roles and responsibilities.

Health initiatives are also governed by guidelines from our Healthcare business sector and our **Charter on Access to Health in Developing Countries**. When calculating the value of our medicine donations, we take into account the **Guidelines for Medical Donations** issued by the World Health Organization (**WHO**).

With our Corporate Volunteering Guideline, we want to strengthen and encourage **volunteering initiatives by our employees**. They may take up to two days of paid leave per year to participate in volunteering activities that are either run or supported by our company.

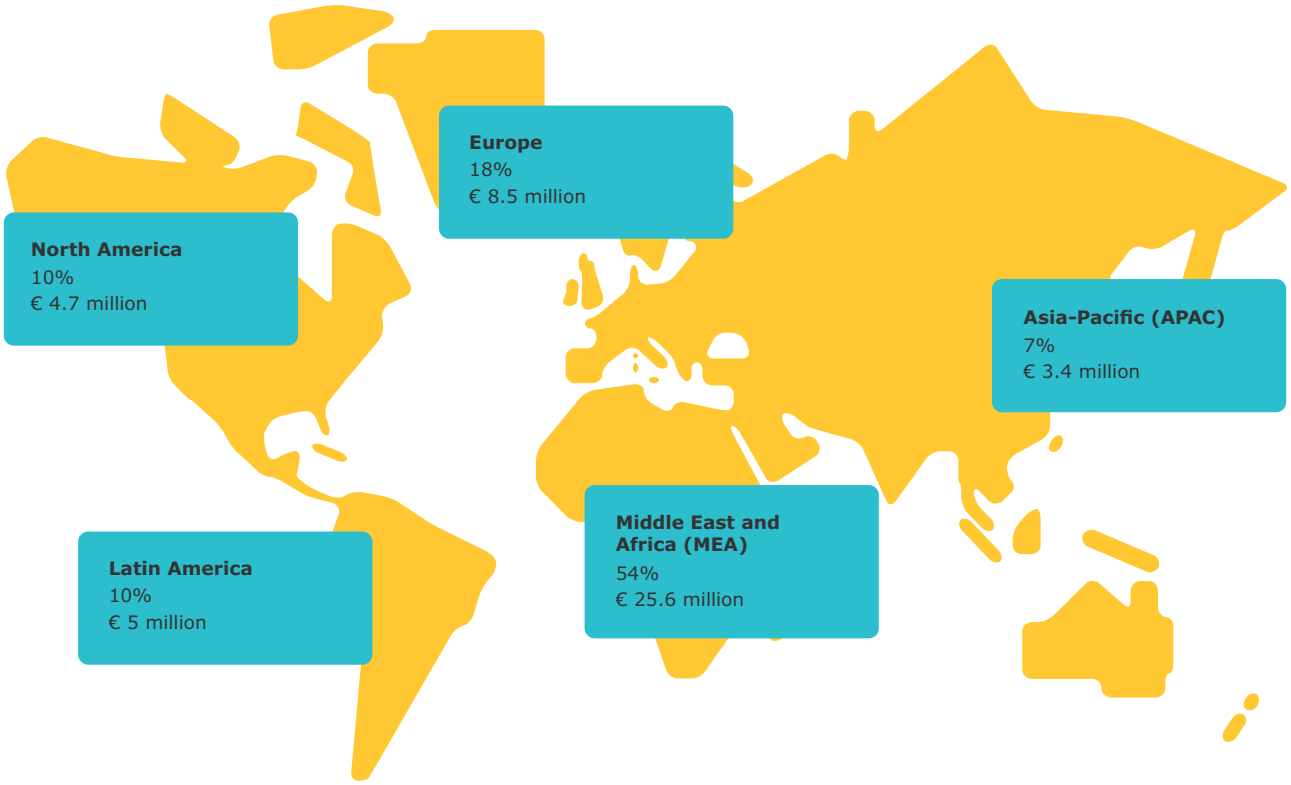
Our Good Deeds

Our community outreach activities are collectively referred to as **Our Good Deeds**. In 2023, we supported **155 projects in 100 countries** in the fields of health, environment, education, and culture. In addition, we supported people in need in our local communities and provided disaster relief.

Our community engagement activities – 2023

Our projects include **volunteering initiatives as well as monetary and product donations**. In 2023, we spent a total of around € 47 million on community engagement. Product and in-kind donations accounted for 53%, cash donations for 43% of this amount and time spent by our employees managing projects and volunteering accounted for the remaining 4%. Our employees actively participated in 51% of the projects, either through monetary donations or volunteer work. As part of the volunteering initiatives, around 4,500 employees volunteered around 26,400 hours during their working hours. The amount contributed by the Merck Foundation is not included in this figure. Nor are initiatives that primarily serve to market our products.

Spending on community engagement by target region



Support for health projects

We use our expertise to support health initiatives around the world. In particular, we focus on providing basic and advanced training for health workers, promoting local healthcare infrastructure and educating people on health issues.

Through our Global Medical Units Function, we support and organize medical education programs that aim to enhance the knowledge and skills of scientists and healthcare professionals, leading to improved patient outcomes. We offer and fund different program types, including independent and continuing medical education, company-led programs, fellowships, and treatment guidelines to cater to learners' needs.

In the reporting year, we offered our medical education programs online, in-person sessions and hybrid formats. Our goal is to strengthen face-to-face interactions, providing networking opportunities and creating a more dynamic educational experience, reaching a wide range of healthcare professionals.

We are committed to the prevention and treatment of the neglected tropical disease schistosomiasis in school children in sub-Saharan Africa. As part of our Schistosomiasis Elimination Program (**MSEP**) and in partnership with WHO, we donated in the reporting year more than 210 Million praziquantel for the prevention and treatment of the neglected tropical disease schistosomiasis in school-aged children in sub-Saharan Africa. Further details about our MSEP program can be found under **Global Health**.

More information on our **health projects** can be found on the **Our Good Deeds** website.

Promoting cultural and educational projects

Our projects in the field of education help to improve **school and university education**. In order to spark young people's interest in science, we organize competitions, recognize special achievements and offer opportunities for hands-on learning.

In Germany, we support and hold various STEM competitions. For example, we have been supporting the **"Jugend forscht"** (young researchers) competition for more than 35 years as the host of the competition in the German federal state of Hesse.

In addition, we support the one-week **Erfinderlabor** (Inventors' Lab) for upper secondary school students as well as the Germany-wide **Tag der Mathematik** (Mathematics Day). Additional competitions that we support include the Hesse/Thuringia state seminar as part of the **international biology and chemistry Olympiads** as well as the **Chemie, die stimmt** competition.

In 2023, as part of our school partnerships, we honored the 60 best students in advanced STEM courses in Darmstadt and the surrounding area for their outstanding high school graduation achievements. The young people also had the opportunity to experience our Darmstadt site.

Together with TU Darmstadt, we operate student laboratories for biology and chemistry. In 2023, these laboratories hosted 250 events with around 5,000 participants in total.

Together with the German journal Chemie in unserer Zeit, we award the Julius Adolph Stöckhardt prize to teachers. In 2023, this award, which includes prize money of € 2,000, was granted to a teacher in the German federal state of Lower Saxony. Her ProChem series of lessons combines complex scientific concepts with storytelling to spark young people's interest in chemistry.

Together with the SCHULEWIRTSCHAFT Südhessen working group, we organized a conference for teachers on the topic of plastics as part of school and sustainable education.

We continued the Kindergartenbox, which aims to get very young people interested in science early on and spark their curiosity. The box offers an experimentation program with everyday topics. With the help of this box, employees introduce children to experimentation together. The project therefore gives our employees the opportunity to engage in community outreach. Since the start of the project, our employees have already visited 40 kindergartens in Germany.

In 2023, we once again supported the Hessentag, this time in Pfungstadt, and were represented by the Merck researcher tent. Furthermore, we invited employees and their families to do some experiments together before Christmas at our Darmstadt site.

Further information on the programs of our school partnerships can be found on our **website**.

As part of our **SPARK™** global volunteer program, employees from our Life Science business sector share their skills and experience with students in order to spark their curiosity in science and inspire them to consider a STEM career.

Two key programs, the Curiosity Cube and Curiosity Labs™, help us do this. The **Curiosity Cube,** a shipping container that has been retrofitted and converted into a mobile science lab, is equipped with hands-on science experiments designed to spark curiosity in the next generation of scientists throughout North America and Europe. Throughout the 2023 tour, we organized a total of 259 events in 184 communities across 13 countries, reaching more than 40,500 students.

In addition, the **Curiosity Labs™** program engages students through hands-on learning. It also applies scientific concepts to “real world” scenarios and connects students with professional scientists – allowing them to learn first-hand about STEM concepts and careers in their very own communities. In 2023, we introduced two new Curiosity Labs™ lessons to our lesson library, focusing on biologic therapies and germ detection, and now offer a total of eight lessons. Our employees have taught nearly 400 lessons in 11 countries, reaching nearly 10,000 students.

In 2023, more than 3,000 employees volunteered more than 21,700 hours through SPARK™ overall, reaching more than 82,300 students across 22 countries.

In addition, we partner with nonprofit organization Beyond Benign to transform chemistry education to better prepare next generation scientists with skills to address sustainability through chemistry. In March 2023, we announced our expanded contribution, enabling the organization to increase global access to online green chemistry resources and trainings. In addition, we have supported the organization’s Green Chemistry Commitment (GCC), in which 150 universities have committed to integrate green chemistry into their institution, reaching more than 3,300 faculty and 834,500 students – exceeding the already ambitious goals we set for the partnership.

Apart from our educational projects, we promote music and literature. We are convinced that culture inspires people – and that inspiration can lead to progress.

We support the **Deutsche Philharmonie Merck** – a professional symphony orchestra. It is an integral part of cultural life in Darmstadt and the surrounding region and regularly tours internationally. In 2023, the orchestra gave 25 concerts in front of live audiences, three of which were guest performances. The musical Advent calendar, a digital video project, was also continued.

Like music, literature is an important mediator between cultures. We therefore award **three literary prizes worldwide**: in Germany, India and Japan. These awards mainly recognize authors whose work builds bridges between cultures as well as between literature and science.

More information about our **cultural and educational projects** can be found on our website **Our Good Deeds**.

Supporting environmental initiatives

We are involved in various environmental initiatives and promote **environmental awareness among our workforce** through activities anyone can take part in. Our engagement ranges from joint litter collection and tree planting campaigns to supporting organizations that improve access to clean water in remote areas.

More information about the **environmental initiatives** that we support can be found on our website **Our Good Deeds**.

Disaster relief

In February 2023, we started a donation campaign for those affected by the earthquake in the border region between Türkiye and Syria. Using a donation platform specially set-up by the United Nations Children’s Fund (UNICEF), our employees raised around € 270,000. The company matched these donations. We thus contributed to disaster relief, aid and reconstruction programs. In addition, we donated medicines worth around € 20,000.

To support victims of natural disasters in Morocco and Libya, we also set up a donation platform for our employees via the German Red Cross in September 2023. Employee donations totaled over € 45,000. The company also matched this amount.

FACTS & FIGURES

190 Report profile

193 Indicators

- **193** Economics
- **194** Business ethics
- **197** Employees
- **212** Environment
- **219** Community

221 GRI content index

- **221** General disclosures
- **225** Economic standards
- **229** Environmental standards
- **235** Social standards
- **244** Additional material topics

246 SASB index

259 TCFD report

270 Assurance report

Report profile

Our company has a long history of corporate responsibility. This is also reflected in our reporting practices. We have been publishing reports on our efforts to live up to our corporate responsibility since 1993, focusing initially on environmental topics. In 2003, we began reporting on sustainability topics every two years. Since 2016, we have been publishing a report annually.

In this Sustainability Report, we describe the **strategic direction** of our sustainable entrepreneurship as well as focus areas in which we intend to achieve our sustainability goals. We want to inform our **stakeholders** transparently and comprehensively about our activities and successes as well as the challenges we face. This also includes classifying actual and potential positive and negative **impacts** of our business activities.

Effective immediately, we report our progress towards implementing the principles of the United Nations Global Compact via the **portal** dedicated to this purpose. For this reason, our Sustainability Report no longer includes Communication on Progress.

Reporting framework

This report covers fiscal 2023 and pertains to our entire Group including its 225 fully consolidated legal entities with personnel in 65 countries. Any deviations from this reporting framework are indicated on a case-by-case basis.

Determining report content

We align the content of our report with the internationally recognized sustainability reporting standards of the Global Reporting Initiative (**GRI**). In doing so, we observe prescribed reporting principles, such as accuracy, balance, topicality, and verifiability. The report has been prepared in accordance with the current **GRI-Standards 2021**.

Moreover, we are integrating our disclosures pursuant to the requirements of the Task Force on Climate-Related Financial Disclosures (**TCFD**) and of the **SASB** standards (Sustainability Accounting Standards Board) into the Sustainability Report. In doing so, we intend to meet the increasing transparency expectations of various investor groups and other stakeholders.

Every year, we carry out a materiality analysis to determine the sustainability topics of relevance to our Group. We have derived the content of this sustainability report from the results of the materiality analysis, which can be found together with the materiality matrix under **Materiality analysis**.

Our Executive Board has reviewed and approved the Sustainability Report for 2023.

Data collection and consolidation systems

The 2023 Sustainability Report generally provides non-financial indicators for the entire Group. The majority of the figures we publish reflect the status as of December 31, 2023. We explicitly state when, in individual cases, the information provided deviates from these parameters.

We use a Group-wide electronic data collection system to collect environmental and occupational health and safety data. The data are recorded at site level and are subject to approval in accordance with the dual-control principle. To improve the quality of these data, we support the sites both in optimizing their collection processes and their corresponding quality assurance measures. Moreover, our Corporate Sustainability, Quality and Trade Compliance function takes measures, such as internal EHS audits, to review both the processes and the data provided.

We collect environmental performance indicators across all our production sites. We also record these indicators for the warehouse, research and office locations that are relevant in terms of their environmental impact.

All employee master data is continually updated in an SAP database. Some employee data are only disclosed for select sites or countries, which are indicated accordingly in the respective text passages.

We use community data management software to track data pertaining to our community engagement activities.

Non-financial statement pursuant to the German Commercial Code

The combined management report of Merck KGaA and the Merck Group for fiscal 2023 includes a combined non-financial statement in accordance with sections 315b and 315c in conjunction with 289b to 289e of the German Commercial Code (HGB) in the form of a separate chapter. The scope of consolidation of this non-financial statement corresponds to that of the Annual Report for 2023. The concepts and results presented relate to both Merck KGaA and the Merck Group. Our non-financial statement orients towards the requirements of the Global Reporting Initiative (GRI) standard. It also includes reporting in accordance with the EU Taxonomy Regulation. The content of this non-financial declaration has also been reviewed by the Supervisory Board in accordance with section 111 (2) of the German Stock Corporation Act (AktG).

External audit

Deloitte GmbH Wirtschaftsprüfungsgesellschaft has audited the consolidated financial statements and combined management report of our company for the fiscal year spanning January 1 to December 31, 2023 and has issued an unqualified opinion. The combined **non-financial statement** contained in the management report underwent a separate audit by Deloitte GmbH Wirtschaftsprüfungsgesellschaft in order to obtain limited assurance.

This voluntary Sustainability Report for 2023, including the information in the **TCFD** index was also audited by Deloitte GmbH Wirtschaftsprüfungsgesellschaft in order to obtain **limited assurance**.

The additional content provided on both the company's websites as well as external web pages that are linked in this report are not part of the information assured by Deloitte GmbH Wirtschaftsprüfungsgesellschaft.

Contacts:

We welcome your feedback and would be happy to answer any questions.

Merck KGaA
Corporate Sustainability, Quality and Trade Compliance
Group Corporate Sustainability

Maria Schaad
Frankfurter Str. 250
64293 Darmstadt Germany

Tel.: +49 6151 72-0
E-Mail: **service@merckgroup.com**

The current report was published on April 11, 2024.

Gender-neutral language:
It is our aim to ensure that our communication is inclusive and so we strive to use language that is both nondiscriminatory and easy to read. This report attempts to use gender-neutral language, which may not yet be consistent in all instances.

Indicators

Economics

Net sales, operating result (EBIT) and research and development costs, by business sector[1]

€ million	Life Science	Healthcare	Electronics	Group
2022				
Net sales	10,380	7,839	4,013	**22,232**
Operating result (EBIT)	2,808	1,895	572	**4,474**
R&D costs[2]	399	1,694	308	**2,521**
2023				
Net sales	9,281	8,053	3,659	**20,993**
Operating result (EBIT)	1,850	2,225	248	**3,609**
R&D costs[2]	396	1,657	297	**2,445**

1 As a non-operating segment, Corporate and Other is not shown here as a separate item, but rather under Segment Reporting in our **Annual Report 2023** (p. 249-253).
2 Not presented are research and development costs of € 94 million (2022: € 119 million) allocated to Corporate and Other.

Business ethics

Compliance training

	2020	2021	2022	2023 Merck Group[1]	2023 thereof Merck KGaA
Total number of persons trained on anti-corruption guidelines[2]	**28,827**	**5,790**	**5,082**	**6,688**	**486**
Total number of employees trained on anti-corruption guidelines	**28,805**	**5,772**	**5,071**	**6,671**	**486**
% of employees trained on anti-corruption	50	10	8	11	12
by employee category[3]					
Number of Role 2+ employees trained on anti-corruption	27,123	5,284	4,658	6,325	463
% of Role 2+ employees trained on anti-corruption	90	17	14	18	18
% of employees below Role 2 trained on anti-corruption	6	2	1	1	2
by region (%)					
Europe	51	8	7	10	2
North America	45	11	8	8	not applicable
Asia-Pacific (APAC)	44	12	9	14	not applicable
Latin America	44	8	7	13	not applicable
Middle East and Africa (MEA)	66	12	9	16	not applicable

1 The anti-corruption e-learning rolled out in 2020 was replaced by a new training course on November 1, 2023. The data for 2023 includes the completion figures for both the old and the new e-learning. A total of 2,177 employees completed the old e-learning course.
2 Includes contractors, external supervised workers (e.g. temporary workers) and contract partners working on-site who were trained on anti-corruption guidelines (2023: 13).
3 Employees whose role level had not yet been recorded in our database by December 31 of the respective reporting year have been allocated to “employees below Role 2”.

The (employee) target audience for a specific training is related to the risk level associated with employee positions and Role levels. Target audiences therefore may not include all Group employees and also may vary from training to training.

In order to address the special responsibility held by management personnel, and staff with HR responsibility, trainings on anti-corruption guidelines for these employees are in focus. This applies to all employees rated Role 2+.

At the beginning of 2020, the old e-learning course on anti-corruption was rolled out for a broad target group. The majority of this target group already completed the e-learning in 2020. The number of employees trained is comparatively lower in 2021 and 2022, as the training was only assigned to new joiners, internal transfers or employees who did not yet complete the e-learning. In 2023, we record an increase again as we replaced the former e-learning course with a new one in November. In addition to anti-corruption, the new training also covers the topic of money laundering.

Internal audits on corruption

	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA[1]
Number of audits relating to corruption	52	56	55	53	17
% of audits relating to corruption	66	67	70	66	21

1 Includes global audits which are conducted at the headquarters in Darmstadt and/or the management of the audited function is reporting into KGaA.

Human rights violations

	2020	2021	2022	2023
Number of reported violations of Social and Labor Standards Policy	108	121	136	184
Number of confirmed violations of Social and Labor Standards Policy	29	41	68	60
thereof number of incidents of discrimination	2	6	7	7[1]

1 As of 2023, the incidents of discrimination also include cases of harrassment as a specific form of discrimination.

Reported compliance violations

	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
Total number of reported compliance violations					
Number of reported compliance incidents	81	79	79	106	9
Number of confirmed cases	41	42	28	32	1
Confirmed cases by category					
Bribery and corruption	6	1	2	1	0
Violation of cartel laws and fair competition rules	0	0	1	0	0
Fraudulent actions against Merck	11	6	11	3	0
Other violations of the Merck Compliance Principles for the relations with business partners	0	0	2	3	0
Other violations of Merck values, internal guidelines or legal requirements	24	35	12	25	1

Data Privacy

	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
Reported violations of Data Privacy Guidelines	3	3	4	7	0
Customer Privacy[1]					
Total number of substantiated complaints received from outside parties	0	0	0	0	0
Total number of complaints from regulatory bodies	0	0	0	0	0
Total number of identified leaks, thefts, or losses of customer data	0	0	0	1	0

1 These data only reflect incidents classified as significant.

Legal actions

	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
Total number[1] **of legal actions pending or completed (for anti-competitive behavior, violations of anti-trust or violations of monopoly legislation)**	**4**	**4**	**3**	**2**	**1**
pending	4	3	2	1	1
completed	0	1	1	1	0

1 As published in the annual reports, the herein listed total number of legal actions refers to the significant legal risks as per the company's definition. The significance of legal risks is based on potential negative effects on projected financial objectives as well as on the probability of occurrence.

For further information please see our annual reports:
Annual Report 2020, pages 125-127 and pages 252-256, No. 27
Annual Report 2021, pages 100-101 and pages 280-284, No. 27
Annual Report 2022, pages 97-98 and pages 282-285, No. 27
Annual Report 2023, pages 90-91 and pages 284-287, No. 27

Employees

Total number of employees

As of Dec. 31	2020	2021	2022	2023 Merck Group[1]	2023 thereof Merck KGaA[2]
Total number of employees	**58,127**	**60,348**	**64,243**	**62,908**	**3,924**
Men	33,204	34,274	36,452	35,499	2,387
Women	24,923	26,074	27,791	27,409	1,537

1 Merck also employs people at sites of subsidiaries that are not fully consolidated. For the 2023 reporting year, we have aligned the scope of consolidation also for the employee data in the non-financial reporting with the financial reporting. As of now, the figures relate to all employees who are employed in fully consolidated subsidiaries with personnel.

2 The sharp decline in comparison with the previous year (8,485 employees) is attributable to the fact that in addition to Healthcare KGaA, which was hived off in 2019, the two other business sectors, namely Life Science und Electronics, have now also been transferred to separate legal entities.

Number of employees by hierarchical level

As of Dec. 31	2020	2021	2022	2023 Merck Group[1]	2023 thereof Merck KGaA[2]
Total employees	**58,127**	**60,348**	**64,243**	**62,908**	**3,924**
Senior management (Role 6+)	193	194	191	200	48
Middle management (Role 4 & 5)	3,637	3,831	4,018	4,139	600
Low management (Role 3)	10,286	10,880	11,877	11,907	1,275
Other employees (below Role 3)	44,011	45,443	48,157	46,662	2,001
% of women (total)	**43**	**43**	**43**	**44**	**39**
thereof number of women in senior management (Role 6+)	42	49	51	58	15
thereof number of women in middle management (Role 4 & 5)	1,284	1,413	1,550	1,622	214
thereof number of women in low management (Role 3)	4,352	4,669	5,123	5,150	475
thereof number of women in “other employees (below Role 3)”	19,245	19,943	21,067	20,579	833
% of men (total)	**57**	**57**	**57**	**56**	**61**
thereof number of men in senior management (Role 6+)	151	145	140	142	33
thereof number of men in middle management (Role 4 & 5)	2,353	2,418	2,468	2,517	386
thereof number of men in low management (Role 3)	5,934	6,211	6,754	6,757	800
thereof number of men in “other employees (below Role 3)”	24,766	25,500	27,090	26,083	1,168
by age group					
Up to 29 years old (%)	**15**	**15**	**15**	**14**	**14**
thereof number of employees in senior management (Role 6+)	0	0	0	0	0
thereof number of employees in middle management (Role 4 & 5)	6	8	12	8	2
thereof number of employees in low management (Role 3)	199	241	263	249	39
thereof number of employees in “other employees (below Role 3)”	8,365	8,880	9,651	8,484	494

1 Merck also employs people at sites of subsidiaries that are not fully consolidated. For the 2023 reporting year, we have aligned the scope of consolidation also for the employee data in the non-financial reporting with the financial reporting. As of now, the figures relate to all employees who are employed in fully consolidated subsidiaries with personnel.

2 The sharp decline in comparison with the previous year (8,485 employees) is attributable to the fact that in addition to Healthcare KGaA, which was hived off in 2019, the two other business sectors, namely Life Science und Electronics, have now also been transferred to separate legal entities.

As of Dec. 31	2020	2021	2022	**2023 Merck Group[1]**	**2023 thereof Merck KGaA[2]**
30 to 49 years old (%)	**60**	**60**	**60**	**60**	**53**
thereof number of employees in senior management (Role 6+)	68	63	58	65	19
thereof number of employees in middle management (Role 4 & 5)	2,032	2,172	2,235	2,283	367
thereof number of employees in low management (Role 3)	6,926	7,298	8,007	7,963	805
thereof number of employees in “other employees (below Role 3)”	25,948	26,624	28,124	27,697	894
50 years or older (%)	**25**	**25**	**25**	**26**	**33**
thereof number of employees in senior management (Role 6+)	125	131	133	135	29
thereof number of employees in middle management (Role 4 & 5)	1,599	1,651	1,771	1,848	231
thereof number of employees in low management (Role 3)	3,161	3,341	3,607	3,695	431
thereof number of employees in “other employees (below Role 3)”	9,698	9,939	10,382	10,481	613

1 Merck also employs people at sites of subsidiaries that are not fully consolidated. For the 2023 reporting year, we have aligned the scope of consolidation also for the employee data in the non-financial reporting with the financial reporting. As of now, the figures relate to all employees who are employed in fully consolidated subsidiaries with personnel.

2 The sharp decline in comparison with the previous year (8,485 employees) is attributable to the fact that in addition to Healthcare KGaA, which was hived off in 2019, the two other business sectors, namely Life Science und Electronics, have now also been transferred to separate legal entities.

Average number of employees by functional area[1]

	2020[2]	2021	2022	**2023**
Group	**57,612**	**58,731**	**62,565**	**63,000**
thereof women	**24,746**	**25,295**	**27,123**	**27,461**
Production	17,624	19,782	22,086	23,827
thereof women	6,043	6,541	7,510	8,429
Logistics/Supply Chain	4,298	4,557	4,850	4,946
thereof women	1,734	1,838	1,928	1,970
Marketing and Sales/Commercials	14,127	14,318	15,095	14,021
thereof women	6,787	6,906	7,349	7,099
Administration	11,342	11,824	11,889	11,924
thereof women	5,499	5,718	5,868	5,891
Research and Development	7,504	7,168	7,335	6,473
thereof women	3,996	3,694	3,740	3,249
Infrastructure and Other	2,717	1,083	1,309	1,810
thereof women	687	598	727	824

1 The average employee headcount is calculated by adding up all employees at the end of each of the last 13 months, and dividing this total by 13.

2 The average employee headcount for fiscal 2020 incorporates the Allergopharma employees on a pro rata basis up until the end of March 2020 due to the divestment of the Allergopharma business as of March 31, 2020.

Number of employees by region

As of Dec. 31	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
Total	**58,127**	**60,348**	**64,243**	**62,908**	**3,924**
Europe	**26,587**	**27,217**	**28,244**	**28,304**	**3,924**
Women	11,743	12,098	12,620	12,681	1,537
Women (%)	44	44	45	45	39
Number of employees with temporary contracts	1,105	988	882	659	73
% of employees with temporary contracts	4	4	3	2	2
North America	**13,312**	**14,070**	**15,847**	**14,718**	**0**
Women	5,527	5,800	6,501	6,113	not applicable
Women (%)	42	41	41	42	not applicable
Number of employees with temporary contracts	139	115	31	20	not applicable
% of employees with temporary contracts	1	1	0	0	not applicable
Asia-Pacific (APAC)	**13,518**	**14,285**	**15,412**	**15,259**	**0**
Women	5,425	5,874	6,351	6,357	not applicable
Women (%)	40	41	41	42	not applicable
Number of employees with temporary contracts	3,362	3,660	3,726	3,182	not applicable
% of employees with temporary contracts	25	26	24	21	not applicable
Latin America	**3,387**	**3,529**	**3,490**	**3,458**	**0**
Women	1,630	1,721	1,715	1,693	not applicable
Women (%)	48	49	49	49	not applicable
Number of employees with temporary contracts	67	12	8	7	not applicable
% of employees with temporary contracts	2	0	0	0	not applicable
Middle East and Africa (MEA)	**1,323**	**1,247**	**1,250**	**1,169**	**0**
Women	598	581	604	565	not applicable
Women (%)	45	47	48	48	not applicable
Number of employees with temporary contracts	420	59	9	9	not applicable
% of employees with temporary contracts	32	5	1	1	not applicable

Employees by business sector

As of Dec. 31	2020	2021	2022	**2023**
Life Science employees	**23,196**	**25,323**	**28,013**	**27,947**
thereof women	10,175	11,255	12,473	12,490
thereof women (%)	44	44	45	45
Healthcare employees	**17,463**	**17,269**	**17,339**	**17,765**
thereof women	8,788	8,717	8,805	8,997
thereof women (%)	50	50	51	51
Electronics employees	**7,228**	**7,432**	**8,262**	**8,276**
thereof women	1,666	1,704	1,870	2,000
thereof women (%)	23	23	23	24

Employees by contract type

As of Dec. 31	2020	2021	2022	**2023**
Total employees	**58,127**	**60,348**	**64,243**	**62,908**
Number of employees with permanent contracts	53,034	55,514	59,587	58,972
% of employees with permanent contracts	91	92	93	94
thereof women	22,500	23,640	25,418	25,388
thereof women (%)	42	43	43	43
Number of employees with temporary contracts	5,093	4,834	4,656	3,936
% of employees with temporary contracts	9	8	7	6
thereof women	2,423	2,434	2,373	2,021
thereof women (%)	48	50	51	51
full-time employees	55,220	57,091	60,127	**59,074**
% full-time	95	95	94	94
thereof women	22,572	23,585	24,872	24,576
thereof women (%)	41	41	41	42
part-time employees	2,907	3,257	4,116	**3,834**
% part-time	5	5	6	6
thereof women	2,351	2,489	2,919	2,833
thereof women (%)	81	76	71	74

New employees

As of Dec. 31	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
Total number of new employee hires	**6,669**	**8,960**	**10,682**	**5,490**	**220**
by age group					
up to 29 years old	2,889	3,679	4,314	2,156	170
30 to 49 years old	3,347	4,610	5,397	2,944	45
50 or older	433	671	971	390	5
by gender					
Women	3,016	4,101	4,569	2,493	89
Men	3,653	4,859	6,113	2,997	131
by region					
Europe	2,160	2,567	3,015	2,028	220
North America	1,789	2,855	3,971	1,181	not applicable
Asia-Pacific (APAC)	2,206	2,803	3,071	1,710	not applicable
Latin America	396	579	460	445	not applicable
Middle East and Africa (MEA)	118	156	165	126	not applicable
Rate of new employee hires[1] (%)	**11**	**15**	**17**	**9**	**6**
by age group[2]					
up to 29 years old	43	41	40	39	77
30 to 49 years old	50	51	51	54	21
50 or older	7	8	9	7	2
by gender[2]					
Women	45	46	43	45	40
Men	55	54	57	55	60
by region[2]					
Europe	32	29	28	37	100
North America	27	32	37	22	not applicable
Asia-Pacific (APAC)	33	31	29	31	not applicable
Latin America	6	6	4	8	not applicable
Middle East and Africa (MEA)	2	2	2	2	not applicable

1 Formula for calculating the rate of new employee hires: Total number of new employee hires divided by number of employees at the end of the fiscal year.

2 Formula for calculating the rate of new employee hires by age/gender/region: New employee hires of the focus group divided by the total number of new employee hires.

Staff turnover[1, 2]

	2020[3]	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
Total turnover rate	**8.22**	**10.82**	**10.16**	**9.96**	**3.48**
Turnover rate by gender					
Men	8.22	10.69	10.40	10.11	3.24
Women	8.22	11.00	9.93	9.76	3.87
Turnover rate by age group					
Up to 29 years old	11.30	16.64	15.91	14.39	5.79
30 to 49 years old	7.74	10.05	9.55	9.48	3.41
50 or older	7.52	9.22	8.05	8.49	2.62
Turnover rate by region					
Europe	5.64	6.00	5.91	5.52	3.48
North America	9.79	15.44	14.33	15.02	not applicable
Asia-Pacific (APAC)	10.60	14.66	12.84	11.90	not applicable
Latin America	11.40	12.95	13.38	13.19	not applicable
Middle East and Africa (MEA)	11.80	16.57	13.04	15.63	not applicable
Total number of leavers	**4,721**	**6,354**	**6,358**	**6,336**	**152**
by gender					
Men	2,697	3,575	3,673	3,639	87
Women	2,024	2,779	2,685	2,697	65
by age group					
Up to 29 years old	974	1,451	1,542	1,358	32
30 to 49 years old	2,677	3,545	3,569	3,624	82
50 or older	1,070	1,358	1,247	1,354	38
by region					
Europe	1,490	1,601	1,640	1,560	152
North America	1,281	2,078	2,182	2,305	not applicable
Asia-Pacific (APAC)	1,394	2,015	1,905	1,824	not applicable
Latin America	398	449	467	460	not applicable
Middle East and Africa (MEA)	158	211	164	187	not applicable

1 The table contains unadjusted turnover rates. The rate excludes employees who pause due to parental leave or a long-term illness, as well as employees who are transitioning to the non-working phase of partial retirement.

2 The employee turnover rate is calculated as follows: Total number of leavers from the past 12 months divided by the average employee headcount multiplied by 100.

3 The figures do not reflect the approximately 500 Allergopharma employees, who were not included in the employee turnover rate due to the divestment of the business.

In 2023, the average length of service for employees Group-wide was 9.7 years (2022: 9.2 years), with 15.2 years (2022: 15.4 years) for Merck KGaA employees.

Work-related accidents[1]

	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
Lost Time Injury Rate (LTIR = workplace accidents resulting in missed days of work per one million hours worked)	**1.3**	**1.2**	**1.2**	**1.3**	**1.6**
by region					
Europe	2.4	2.1	1.7	2.2	1.6
North America	0.8	1.2	1.7	1.4	not applicable
Asia-Pacific (APAC)	0.1	0.1	0.3	0.1	not applicable
Latin America	0.8	0.4	0.6	0.6	not applicable
Middle East and Africa (MEA)	0.4	0.0	1.1	0.4	not applicable
Number of deaths	**0**	**0**	**0**	**0**	**0**
by region					
Europe	0	0	0	0	0
North America	0	0	0	0	not applicable
Asia-Pacific (APAC)	0	0	0	0	not applicable
Latin America	0	0	0	0	not applicable
Middle East and Africa (MEA)	0	0	0	0	not applicable
by gender					
Women	0	0	0	0	0
Men	0	0	0	0	0

1 Including supervised temporary staff

Through the LTIR, we record work-related accidents that involve at least one day of missed work. A work-related accident is an injury that results from the type of work, in the course of doing said work, and that has no internal cause. Work-related accidents are considered relevant if they occur on the premises, on business trips, during goods transport, as a result of external influences (e.g. natural disasters), or due to criminal acts involving personal injury. Commuting accidents and accidents during company sporting activities are not included. First-aid incidents are generally not included in the LTIR since these usually do not result in more than one day of missed work.

We aim to sustainably lower our LTIR to 1.0 by 2025.

The LTIR is the key occupational safety indicator for the Merck Group as a whole. Therefore, we do not publish any other indicators such as workplace accidents, lost days or days of absence. The LTIR is not broken down by gender as this differentiation is not relevant to our strategic planning.

For Merck KGaA (about 6% of the employees of the Merck Group), we only report work-related illnesses if these have been certified as an occupational illness by the employers' liability insurance association. In 2023 period, one case of work-induced illness were verified.

Employees who regularly receive a performance and development evaluation[1]

	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
% of employees who receive a performance and development evaluation	**98**	**98**	**98**	**98**	**100**
by gender					
Women	98	98	99	99	100
Men	98	98	98	98	100
by employee category					
Senior management (Role 6+)	100	100	100	100	100
Middle management (Role 4 & 5)	100	100	100	100	100
Low management (Role 3)	100	100	100	100	100
Other employees (below Role 3)	98	98	98	98	100

1 Employees whose role level had not yet been recorded in our database by December 31 of the reporting year are included under "other employees (below Role 3)".

Regular feedback and employee performance evaluations are essential to fairly ranking individual performance and to helping all employees follow their own career path at Merck. Our globally uniform Performance Management Process requires annual feedback meetings and performance assessments. Apart from evaluating employee performance, this helps us to identify individual development opportunities.

In Germany, all permanent employees have been participating in the Performance Management Process since 2013. In 2023, a total of 61,863 employees worldwide were involved in the process. The Performance Management Process is coordinated via our online platform HR4You.

Internationality of employees

As of Dec. 31	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
Number of nationalities	141	142	139	141	70
Number of nationalities in management positions (Role 4 or above)	75	79	78	77	30
% of non-Germans in management positions (Role 4 or above)	66	66	66	66	12

Employee age by region

As of Dec. 31

Number of employees	Worldwide	North America	Europe	Merck KGaA	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
2022							
Up to 29 years old	9,926	2,753	3,530	1,181	2,999	476	168
thereof women	4,637	1,178	1,655	441	1,441	264	99
30 to 49 years old	38,423	7,811	16,216	4,549	11,174	2,333	890
thereof women	16,909	3,278	7,528	1,664	4,498	1,196	409
50 or older	15,894	5,283	8,498	2,755	1,239	681	192
thereof women	6,245	2,045	3,437	870	412	255	96
Average age	**41.6**	**43.3**	**43.1**	**43.1**	**37.3**	**41.1**	**40.3**
Total employees	**64,243**	**15,847**	**28,244**	**8,485**	**15,412**	**3,490**	**1,250**
2023							
Up to 29 years old	8,743	2,233	3,294	535	2,634	440	142
thereof women	4,150	995	1,521	213	1,323	224	87
30 to 49 years old	38,006	7,352	16,304	2,085	11,218	2,301	831
thereof women	16,798	3,084	7,565	857	4,562	1,203	384
50 or older	16,159	5,133	8,706	1,304	1,407	717	196
thereof women	6,461	2,034	3,595	467	472	266	94
Average age	**41.5**	**43.5**	**42.9**	**43.0**	**37.4**	**40.8**	**40.5**
Total employees	**62,908**	**14,718**	**28,304**	**3,924**	**15,259**	**3,458**	**1,169**

Age of youngest employee

As of Dec. 31	2020	2021	2022	**2023**
Age of youngest employee, excluding apprentices	18	18	18	17

Voluntary insurance benefits (voluntarily introduced and (co-) financed)

As of Dec. 31	2020[1]	2021	2022	**2023 Merck Group**	**2023 thereof Merck KGaA**
% of employees with healthcare benefits[2]	63	64	62	73	0
% of employees with Group accident insurance[3]	41	41	37	48	13
% of employees with life insurance[4]	56	59	59	64	0
% of employees with disability insurance (short-term and long-term)[5]	39	39	43	43	0

1 The figures exclude Versum Materials and Intermolecular since the integration process was still underway at this point of time.
2 Any spend on voluntarily introduced and (co-) financed healthcare benefits for employees and possibly their dependents. Not taking into consideration any mandatory social security cover (mostly covered by an insurance policy).
3 Any spend on voluntarily introduced and (co-) financed accident insurance that pays a defined amount in case of death or disability caused by a work-related accident (not taking into consideration any mandatory social security cover, e.g. workman's compensation).
4 Any spend on voluntarily introduced and (co-) financed life insurance cover that pays a defined amount of money in case of natural death (not accidental).
5 Any spend on voluntarily introduced and (co-) financed insurance cover that disability pays for salary continuation in case of inability to work caused by an insured incident.

All our employees are where possible covered by either statutory or voluntary accident insurance and health benefits. Employees of Merck KGaA are covered by statutory insurance as stipulated by the regulations in force in Germany.

We offer a company pension in numerous countries along with various programs for supplemental company pensions and survivor's benefits.

The global benefits listed in the table above are designed to provide additional security to our workforce and their families and to improve their quality of life. Benefits represent voluntarily employer-initiated as well as employer-financed assistance to our workforce in addition to the regular compensation package.

Our benefits offer meaningful choices, where possible, to support a diverse workforce and are sensitive to the needs and customs of the employees who use them, regardless of country, age, family status, interests, or values.

Long-term pension obligations and post-employment benefits

€ million	2020	2021	2022	**2023**
Present value of all defined benefit obligations as of Dec. 31	6,352	5,995	4,287	4,787
Pension expenses	408	461	460	365

Depending on the legal, economic and fiscal circumstances prevailing in each country, different retirement benefit systems are provided for the employees. Generally, these systems are based on the years of service and salaries of the employees. Pension obligations include both defined benefit and defined contribution plans and comprise both obligations from current pensions and accrued benefits for pensions payable in the future. Further information can be found in the note on Provisions for employee benefits (p. 291-297, No. 33) of our **Annual Report 2023**.

Flexible working hours in Germany

As of Dec. 31	2020	2021	2022	**2023**
% of employees utilizing the “mywork@Merck” working model	48	51	55	58

In coordination with their teams and supervisors, employees taking advantage of “mywork@merck” can choose when and where they work.

Parental leave[1]

As of Dec. 31	2020	2021	2022	**2023[2]**
Number of employees with a right to parental leave	351	414	423	127
thereof women (recorded via maternity leave in the respective year)	225	255	287	87
thereof men (recorded via special paternity leave in the respective year)	126	159	136	40
Number of employees who took parental leave[3]	538	617	564	189
thereof women	265	278	237	95
thereof men	273	339	327	94
Number of employees on parental leave who worked part time during their leave	104	198	164	69
thereof women	73	172	137	49
thereof men	31	26	27	20
Number of employees who returned from parental leave[3]	529	597	581	182
thereof women	252	273	235	96
thereof men	277	324	346	86
Return to work rate (%)	98.3	96.8	103.0	96.3
thereof women	95.1	98.2	99.2	101.1
thereof men	101.5	95.6	105.8	91.5
Number of employees still working for Merck one year after their return from parental leave	490	556	548	-[4]
thereof women	220	250	328	-[4]
thereof men	270	306	220	-[4]
Retention rate (%)	92.6	93.1	94.3	-[4]
thereof women	87.3	91.6	139.5	-[4]
thereof men	97.5	94.4	63.5	-[4]

1 Figures pertain only to Merck KGaA (which accounted for around 6% in 2023). Figures are calculated on the basis of the data from one entire year, which also includes those employees who took parental leave during the calendar year but who had not yet returned by Dec. 31.

2 The sharp decline in comparison with the previous years is attributable to the fact that in addition to Healthcare KGaA, which was hived off in 2019, the two other business sectors, namely Life Science und Electronics, have now also been transferred to separate legal entities.

3 Since parental leave can be taken for a period ranging from one month to three years, it is possible for employees to be recorded across a period of up to four calendar years. This explains why the number of employees on parental leave exceeds the number of employees who have a right to it. It also explains why the “Number of employees who returned from parental leave” might exceed the “Number of employees who took parental leave”.

4 Figure will be available on December 31, 2024.

Employees with disabilities[1] (%)

	2020	2021	2022	**2023**
Employees with disabilities	4.7	4.8	4.9	4.8

1 Only pertains to the joint operation of Merck (which accounted for around 19% of Merck Group employees in 2023, calculations based on the German Social Code IX - SGB IX).

Apprentices in Germany

As of Dec. 31	2020	2021	2022	**2023**
Number of apprentices	607	602	595	619
% of apprentices	4.6	4.1	4.0	4.6

Environment

Total greenhouse gas emissions (Scope 1 and 2 of the GHG Protocol)[1, 2]

metric kilotons	2020	2021	2022	**2023 Merck Group**	**2023 thereof Merck KGaA**
Total CO_2eq[3] emissions[4]	**2,152**	**1,951**	**1,760**	**1,463**	**22**
Thereof					
direct CO_2eq emissions (Scope 1)[5]	1,827	1,626	1,518	1,236	15
indirect CO_2eq emissions (Scope 2)[6]	325	325	242	227	7
Biogenic CO_2 emissions[7]	**14**	**15**	**14**	**14**	**0**

1 In line with the Greenhouse Gas Protocol, for all previous years greenhouse gas emissions were calculated based on the current corporate structure as of Dec. 31 of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).
2 Baseline for our emission targets is 2020.
3 eq = equivalent
4 In 2023, we adjusted our Scope 1 and Scope 2 calculations to reflect minor data corrections.
5 In 2023, we adapted the Scope 1 calculations to the modified global warming potentials of the IPCC 6th assessment report (previously IPCC 5th assessment report) and restated previous years accordingly.
6 The figures presented here have been calculated in accordance with the market-based method.
7 We adapted the calculations to the complete Greenhouse Gas Protocol requirements.

Our response to the **CDP Climate change** contains a detailed description of our calculation methods.

We have included the following gases in our calculation of direct and indirect CO_2eq emissions:

Direct CO_2 emissions: CO_2, HFCs, PFCs, CH_4, N_2O, NF_3, SF_6.

Indirect CO_2 emissions: CO_2.

In 2023, we emitted 0.07 kg of CO_2eq per euro of net sales.

Other relevant indirect greenhouse gas emissions (Scope 3 of the GHG Protocol)[1]

metric kilotons of CO_2 equivalents	2020	2021	2022	**2023**
Total gross other indirect emissions	**5,103**	**5,799**	**6,680**	**4,594**
Purchased goods & services (category 1)[2]	3,040	3,572	4,200	2,517[3]
Capital goods (Category 2)[2]	293	291	388	340[3]
Fuel- and energy-related emissions, not included in Scope 1 or 2 (category 3)	102	143	121	115
Upstream transportation & distribution (category 4)	264	264[4]	319	236[5]
Waste generated in operations (category 5)	85	79	57[6]	32[6]
Business travel (category 6)	32	26	78	86
Employee commuting (category 7)	90	94	99	76[7]
Upstream leased assets (category 8)[8]	-	-	-	-
Downstream transportation & distribution (category 9)	8	8[4]	6	10[5]
Processing of sold products (category 10)[9]	-	-	-	-
Use of sold products (category 11)[10]	1,164	1,296	1,382[11]	1,137
End-of-life treatment of sold products (category 12)	23	23[4]	26[11]	42
Downstream leased assets (category 13)	2	2	2	2
Franchises (category 14)[12]	-	-	-	-
Investments (category 15)	0	1	2	1

1 In line with the Greenhouse Gas Protocol, for all previous years greenhouse gas emissions were calculated based on the current corporate structure as of Dec. 31 of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

2 The reported figures contain 95-97% of our total spend. The difference stems from smaller sites that are not integrated in our Group-wide purchase volume data. 2020 data are slightly over-reported (approx. 3%) as the currency conversion factor (USD to EUR) from 2021 was used. Non-categorized spends are distributed pro rate to category 1 and 2.

3 We updated environmentally extended input-output analysis (EEIO) factors, and we adjusted our emission calculation approach for service categories using primary supplier data.

4 Due to high efforts for data preparation, we reference 2020 data for 2021.

5 In 2023, we introduced a new and improved calculation methodology based on primary data from suppliers/logistics service providers and an energy-based bottom-up calculation approach.

6 We adjusted our calculation methodology to remove non-GHG relevant waste streams.

7 We adjusted our calculation methodology to take into account the results of an internal employee survey on home office use.

8 Already covered under Scope 1 and 2 emissions.

9 Our company produces a huge variety of intermediate products for various purposes. Due to their many applications and our customer structure, the associated greenhouse gas emissions cannot be tracked in a reasonable fashion.

10 In 2023, we adapted the Category 11 calculations to the modified global warming potentials of the IPCC 6th assessment report (previously IPCC 5th assessment report) and restated previous years accordingly.

11 Due to high efforts for data preparation, we partly use 2020 data for 2022.

12 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. Out-licensing in the pharmaceutical sector is not regarded as franchising.

Details on the calculation (methodology, assumptions, uncertainties) of the Scope 3 categories can be found in the **Scope 3 document**.

Biogenic emissions (Scope 3), if present, are not being recorded.

Emissions of ozone-depleting substances

metric tons	2020	2021	2022	**2023**
Total emissions of ozone-depleting substances	2.2	1.5	1.3[1]	1.0
CFC-11eq[2]	0.1	0.1	0.1	0.1

1 Data were retroactively adjusted.
2 CFC-11eq is a unit of measure used to compare the potential of various substances to deplete the ozone. Reference value 1 indicates the potential of CFC-11 to cause the depletion of the ozone layer.

Substances included: R-12, R-22, R-123, R-141b, R-401a, R-402a, R408a, R-409a, R-414b, R-502, R-503.

Source for the emission factors: Montreal Protocol.

Other air emissions

metric kilotons	2020	2021	2022	**2023**
Volatile organic compounds (VOC)	0.3	0.3	0.3	0.3
Nitrogen oxide	0.2	0.3	0.2	0.2
Sulfur dioxide	0.004	0.004	0.005	0.004
Dust	0.010	0.020	0.020	0.010

The VOC, nitrogen oxide, sulfur dioxide, and dust emissions reported here are attributable to production activities as well as energy generation. These figures do not include emissions from vehicles. Emissions are determined partially based on measurements and partially based on calculations or estimates. Only some sites are required to measure individual parameters.

Transport of finished goods, by means of transportation

	2020	2021	2022	**2023**
% truck	70	71	73	74
% boat	22	21	19	19
% airplane	8	8	8	7
% rail	0	0	0.03	0.03

The figures contain the volumes of the biggest global distribution centers of our Life Science, Healthcare and Electronics business sectors. These figures pertain to the total weight of transported products and indicate the primary means of transport.

In shipping finished goods from our production sites to the local warehouses of our subsidiaries, we have been working to reduce the use of air shipping in favor of sea freight. This change aims to both reduce costs as well as lower transport-related CO_2 emissions.

Energy consumption[1]

GWh	2020	2021	2022	2023 Merck Group	2023 thereof Merck KGaA
Total energy consumption	**2,382**	**2,463**	**2,432**	**2,337**	**78**
Direct energy consumption	**1,269**	**1,321**	**1,294**	**1,245**	**68**
Natural gas	1,182	1,235	1,188	1,164	59
Liquid fossil fuels[2]	52	48	70	43	9
Biomass and self-generated renewable energy	35	38	36	38	0
Indirect energy consumption	**1,113**	**1,142**	**1,138**	**1,092**	**10**
Electricity	950	964	984	982	10
Steam, heat, cold	163	178	154	110	0
Total energy sold	**0.2**	**0.1**	**0.0**	**0.00**	**0.0**
Electricity	0.2	0.1	0.0	0.00	0.0
Steam, heat, cold	0.0	0.0	0.0	0.0	0.0
In TJ					
Total energy consumption	**8,575**	**8,867**	**8,755**	**8,413**	**280**
Direct energy consumption	**4,568**	**4,756**	**4,658**	**4,482**	**244**
Natural gas	4,255	4,446	4,277	4,190	212
Liquid fossil fuels[2]	187	173	252	155	32
Biomass and self-generated renewable energy	126	137	130	137	0
Indirect energy consumption	**4,007**	**4,111**	**4,097**	**3,931**	**36**
Electricity	3,420	3,470	3,542	3,535	36
Steam, heat, cold	587	641	554	396	0
Total energy sold	**0.7**	**0.4**	**0.0**	**0.00**	**0.0**
Electricity	0.7	0.4	0.0	0.00	0.0
Steam, heat, cold	0.0	0.0	0.0	0.0	0.0

1 In line with the Greenhouse Gas Protocol, for all previous years energy consumption has been calculated based on the current corporate structure as of Dec. 31 of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

2 Light and heavy fuel oil, liquefied petroleum gas (LPG), diesel, biodiesel, gasoline and kerosene

We use photovoltaics to produce power at multiple sites.

We currently only record purchased secondary energy – this is primarily electricity and, to a lesser extent, heat/steam/cold. Details on the local energy mix, including the respective percentage of primary energy, renewable energy, etc. are not available. Data on local energy efficiency in electricity or heat generation are not available either. Our production sites are located in countries with a widely varying energy mix.

Our Darmstadt and Gernsheim sites in Germany consume the most energy, representing 23% of our Group-wide total. Here, fossil energy (coal, gas, etc.) accounts for approximately 45%, nuclear energy approximately 6% and renewable energies approximately 49% of the energy mix. Renewable energies account for a higher share of electricity generation at production sites in Switzerland, with nuclear energy taking the lead in France. Based on an estimated global energy efficiency of 37% for the conversion and distribution of generated electricity, this results in a primary energy consumption of 2,654 GWh for 2023. Based on an estimated global energy efficiency of 85% for heat/steam/cold, this results in a primary energy consumption of 129 GWh for 2023. This yields a total primary energy consumption of 2,783 GWh for 2023. (The calculation is based on factors stated in the “Manual for energy management in practice - Systematically reducing energy costs” published by DENA, 12/2012).

In 2023, our energy intensity relative to net sales totaled 0.11 kWh/€.

Water withdrawal

millions of m^3	2020	2021	2022	**2023 Merck Group**	**2023 Water stress areas**
Total water withdrawal	**14.0**	**13.5**	**13.2**	**12.1**	**0.16**
Surface water (rivers, lakes)	1.8	1.9	1.8	1.4	0.002
Groundwater	6.7	6.3	6.3	5.8	0.002
Drinking water (from local suppliers)	5.4	5.2	5.0	4.8	0.16
Rain water and other sources	0.06	0.06	0.06	0.06	0.002

These figures do not include the ground water that we use for safety measures at our Gernsheim site in Germany. Here, the water is fed back directly into natural circulation.

The volume of seawater and produced water withdrawn is not significant and is therefore not reported separately.

Water reused

millions of m^3	2020	2021	2022	**2023**
Water reused	22.0	23.5	20.7	20.5

The recirculating cooling system at our Darmstadt, Germany facility accounts for the majority of reused water as it allows the water to be re-utilized multiple times. The volume of reused water is thus greater than the total volume of consumed water.

Wastewater volume

	2020	2021	2022	**2023 Merck Group**
Total wastewater volume (millions of m^3)	**13.4**	**13.3**	**12.4**	**11.1**
Wastewater discharged directly	9.2	9.5	8.6	7.6
Wastewater discharged to third parties	4.1	3.8	3.8	3.4

The volume of seawater and groundwater discharged is not significant and is therefore not reported separately.

Discrepancies between total wastewater volume and the sum of directly discharged wastewater and wastewater sent to third parties arise from other disposal methods, which, however, only result in minor amounts of wastewater. Direct discharges correspond to the “freshwater” classification of the GRI. Indirect discharges correspond to their “other water” classification.

Wastewater quality[1]

	2020	2021	2022	**2023**
Chemical oxygen demand (metric tons of O_2)	1,482	1,426	1,013	1,039
Phosphorous (metric tons)	15	11	10	9
Nitrogen (metric tons)	291	392	363	184
Nickel (kg)	30	32[2]	38[2]	104
Lead (kg)	37	15	16	21
Cadmium (kg)	6	3	5	4
Mercury (kg)	0	1	0	0

1 In alignment with ICCA reporting requirements specified by Cefic, we track heavy metal emissions from lead, cadmium, nickel, and mercury.
2 Data were retroactively adjusted.

The wastewater treatment plant at our site in Gernsheim, Germany also treats wastewater from a neighboring municipality. The communal wastewater from this municipality is included in the emissions stated in the table.

Emissions are determined partially based on measurements and partially based on calculations or estimates. Only some sites are required to measure individual parameters.

These figures reflect the wastewater as it is when it leaves our facilities. Some of the substances in the water are then later removed by third-party purification plants before the water is ultimately discharged into the ecosystem.

Hazardous and non-hazardous waste

metric kilotons	2020	2021	2022	**2023**
Total waste	**229**	**214**	**371**	**291**
Hazardous waste disposed[1]	38	34	36	35
Non-hazardous waste disposed[1]	34	33	31	18
Hazardous waste recycled[2]	90	84	84	81
Non-hazardous waste recycled[2]	67	63	220	157

1 Disposed = incineration (without energy recovery) and landfill
2 Recycled = incineration (with energy recovery) and material recycling

Exported/Imported hazardous waste

metric kilotons	2020	2021	2022	**2023**
Exported[1]	4.0	4.6	3.7	3.3
Imported	0.000	0.000	0.000	0.000

1 Disposal primarily within the EU and the United States.

In 2023, approx. 3% of hazardous waste was shipped internationally.

Waste by disposal method

	2020	2021	2022	**2023**
Total waste (metric kilotons)	**229**	**214**	**371**	**291**
Disposed waste	**72**	**66**	**67**	**53**
Landfilled waste	17	18	20	9
Incinerated waste	55	48	47	44
Recycled waste	**157**	**148**	**304**	**238**
Material recycling	133	124	274	214
Waste-to-energy	24	24	30	24
Recycling rate (%)	**69**	**69**	**82**	**82**

As in previous years, the total waste generated continues to be heavily influenced by the waste from construction and remodeling activities. Construction, excavation and demolition waste accounted for 43% of our waste in 2023. Around 118 metric kilotons of construction, excavation and demolition waste was recycled.

Significant spills

	2020	2021	2022	**2023**
Total number of significant spills	0	0	2	0

Community

Spending on community engagement

€ million	2020	2021	2022	**2023**
Total spending	53.6	43.3	48.1	47.2

When calculating the value of our medicine donations, we take into account the Guidelines for Medical Donations issued by the World Health Organization; for other product donations, we apply their fair value.

The main reasons for the decline in total spending in 2021 were lower Covid-19-related donations as well as a drop in demand for praziquantel tablets in the affected countries due to Covid-19.

Community engagement spending by region[1]

	Europe	North America	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
2022					
€ million	13.1	5.3	5.9	1.3	22.5
%	27	11	12	3	47
2023					
€ million	**8.5**	**4.7**	**3.4**	**5.0**	**25.6**
%	**18**	**10**	**7**	**11**	**54**

1 This table presents the regions across the globe in which we support initiatives. For projects that benefit multiple regions, we have calculated the amount per region by dividing the project spending evenly per country.

Focus of our local community engagement[1]

%	2020	2021	2022	**2023**
Health	36	33	33	30
Education and culture	43	45	32	30
Environment	1	2	5	8
Disaster relief	1	2	8	4
Other	19	18	22	28

1 Based on number of projects

Motivations for our community engagement[1]

%	2020	2021	2022	**2023**
Charitable activities	23	21	12	13
Community investment	72	76	86	82
Commercial initiatives in the community	5	3	2	5

1 Based on total spending on all projects

We categorize the motivations for our activities based on the London Benchmarking Group model as well as the guidelines of the Bertelsmann Foundation for corporate social responsibility. Projects that primarily aim to make improvements within the community are classified as community investment.

Initiatives that are predominantly aimed at company-relevant factors such as image or personnel recruitment are classified as commercial initiatives in the community. Charitable activities cover any other projects that benefit a charitable organization, but cannot be listed under either of the other two motivation categories due to missing data or their narrow scope.

GRI content index

General disclosures

GRI 2: General Disclosures 2021

GRI Standard and disclosure		Reference	Omission reason and Comment
2-1	Organizational details	**Company profile** **List of shareholdings**	
2-2	Entities included in the organization's sustainability reporting	**Report profile** **List of shareholdings**	
2-3	Reporting period, frequency, and contact point	**Report profile**	
2-4	Restatements of information	**Report profile**	
2-5	External assurance	**Assurance report**	
2-6	Activities, value chain, and other business relationships	**Company profile** **Supply chain management** **Mica supply chain** **Report profile** **Fundamental information about the Group** **Macroeconomic and sector-specific environment**	
2-7	Employees	**Report profile** **Indicators: employees**	**Comment:** We report employee figures in line with internal management categories, possibly independent of the region. The employment format "non-guaranteed hours employees" stipulated by the GRI does not represent a relevant employment category for us and is therefore not reported.
2-8	Workers who are not employees	**Career with us**	**Omission reason:** Information unavailable/incomplete **Comment:** Workers who are not employees (e.g. supervised temporary

GRI Standard and disclosure		Reference	Omission reason and Comment
			staff) are not logged in our employee data base. We are reviewing the relevant disclosure for fiscal 2024.
2-9	Governance structure and composition	**Sustainability strategy & goals** **Diversity, equity & inclusion** **Management** **Statement on corporate governance** **Procedures of the Boards** **Objectives of the Supervisory Board**	
2-10	Nomination and selection of the highest governance body	**Procedures of the Boards** **Objectives of the Supervisory Board** **Promote women in management positions** **Diversity policy**	
2-11	Chair of the highest governance body	**Statement on corporate governance**	
2-12	Role of the highest governance body in overseeing the management of impacts	**Sustainability strategy & goals** **Report of the Supervisory Board** **Report on Risks and Opportunities**	
2-13	Delegation of responsibility for managing impacts	**Sustainability strategy & goals**	
2-14	Role of the highest governance body in sustainability reporting	**Report profile**	
2-15	Conflicts of interest	**Information on corporate governance practices**	
2-16	Communication of critical concerns	**Sustainability strategy & goals** **Compliance management** **Indicators: business ethics** **Information on corporate governance practices**	**Omission reason:** Confidentiality constraints **Comment:** Due to the sensitive nature of critical concerns, these figures are only for internal use (except where external reporting is legally required). Significant additions to or changes in the risk register are disclosed in due course to the Executive Board on an ad

GRI Standard and disclosure		Reference	Omission reason and Comment
			hoc basis, as per stipulations in the risk policy.
2-17	Collective knowledge of the highest governance body	**Sustainability strategy & goals** **Information on corporate governance practices**	
2-18	Evaluation of the performance of the highest governance body	**Procedures of the Boards** **Articles of association** **Compensation report**	
2-19	Remuneration policies	**Compensation report**	
2-20	Process to determine remuneration	**Compensation report** **Voting results Annual General Meeting 2023**	
2-21	Annual total compensation ratio	**Career with us**	**Omission reason:** Not applicable **Comment:** Competitive salaries and additional benefits not only increase our attractiveness as an employer; they also motivate our people and build loyalty to the company. The compensation we offer is based on market analyses in the relevant field, the value of the respective position, and the employee's skill set and performance. Compensation and benefits across the entire Group are defined by our global HR policies and frameworks. As far as possible, we strive to offer all our employees comparable compensation structures. Furthermore, we monitor our compliance with minimum standards. We do not consider the information required under GRI 2-21 to be relevant to assessing the fairness of our compensation structures.
2-22	Statement on sustainable development strategy	**Letter from the CEO**	
2-23	Policy commitments	**Governance** **Compliance management** **Human rights**	
2-24	Embedding policy commitments	**Governance**	

GRI Standard and disclosure		Reference	Omission reason and Comment
		Compliance management **Human rights** **Information on corporate governance practices**	
2-25	Processes to remediate negative impacts	**Sustainability strategy & goals** **Materiality analysis** **Compliance management** **Human rights** **Indicators: business ethics** **Report on Risks and Opportunities**	
2-26	Mechanisms for seeking advice and raising concerns	**Sustainability strategy & goals** **Stakeholder dialogue** **Compliance management**	
2-27	Compliance with laws and regulations	**Compliance management** **Interactions with health systems** **Indicators: business ethics** **Other provisions**	
2-28	Membership associations	**Stakeholder dialogue**	
2-29	Approach to stakeholder engagement	**Stakeholder dialogue**	
2-30	Collective bargaining agreements	**Corporate culture**	

GRI 3: Material Topics 2021

GRI Standard and disclosure		Reference	Omission reason and Comment
3-1	Process to determine material topics	**Materiality analysis**	
3-2	List of material topics	**Materiality analysis**	

Economic standards

GRI 201: Economic Performance 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
201: 3-3	Management of material topics	**Company profile** **Statement on corporate governance** **Economic performance** **Pension schemes** **Report on Risks and Opportunities**	
201-1	Direct economic value generated and distributed	**Indicators: employees** **Indicators: economics** **Indicators: community** **Consolidated income statement** **Consolidated cash flow statement** **Operating activities** **Personnel expenses**	
201-2	Financial implications and other risks and opportunities due to climate change	**Climate action** **Water management** **TCFD report** **CDP Climate change** **CDP Water Security** **Report on Risks and Opportunities**	**Comment:** We report in detail on various aspects of climate change as part of our participation in the CDP.
201-3	Defined benefit plan obligations and other retirement plans	**Indicators: employees** **Career with us** **Pension schemes**	**Omission reason:** Information unavailable/incomplete **Comment:** We report on the value of pension liabilities and similar obligations. We are reviewing the relevant disclosures for fiscal 2024 in accordance with 201-3-d and 201-3-e.
201-4	Financial assistance received from government	**Accounting: Property, plant and equipment** **Research and development costs**	

GRI 202: Market Presence 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
202: 3-3	Management of material topics	**Career with us** **Corporate culture**	
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	**Career with us** **Diversity, equity & inclusion**	**Omission reason:** Not applicable **Comment:** This indicator is not relevant to us, which is why we do not collect data on the ratio of the standard entry-level wage compared to the local minimum wage. Our Global Rewards Policies apply to all our subsidiaries worldwide and guarantee a systematic compensation structure. Both base pay and short-term variable compensation are oriented to the median base pay of the relevant reference market. Our pay ranges are reviewed on an annual basis and reflect market conditions. We adhere to local minimum wage levels.
202-2	Proportion of senior management hired from the local community	**Career with us** **Diversity, equity & inclusion**	**Omission reason:** Not applicable **Comment:** We promote both the recruitment of local employees and their international deployment at all hierarchical levels. The jobs posted on the internal job board are visible to all employees, regardless of the country they are in. However, we do not record the proportion of local managers, as this is not relevant for the strategic personnel management of our company.

GRI 203: Indirect Economic Impacts 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
203: 3-3	Management of material topics	**Global Health** **Prices of medicines** **Health capacity & awareness**	

GRI Standard and disclosure		Reference	Omission reason and Comment
203-1	Infrastructure investments and services supported	**Global Health** **Health capacity & awareness** **Mica supply chain** **Community engagement**	
203-2	Significant indirect economic impacts	**Prices of medicines** **Health capacity & awareness** **Community engagement** **Materiality analysis**	

GRI 204: Procurement Practices 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
204: 3-3	Management of material topics	**Supply chain management** **Mica supply chain** **Human rights**	
204-1	Proportion of spending on local suppliers	**Supply chain management**	**Omission reason:** Not applicable **Comment:** We have no internal guidelines stipulating that preference be given to local vendors in allocating contracts and therefore do not collect this type of data. In some countries, local laws require contracts to be awarded to regional suppliers.

GRI 205: Anti-corruption 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
205: 3-3	Management of material topics	**Compliance management** **Interactions with health systems**	
205-1	Operations assessed for risks related to corruption	**Compliance management** **Indicators: business ethics** **Report on Risks and Opportunities**	

GRI Standard and disclosure		Reference	Omission reason and Comment
205-2	Communication and training about anti-corruption policies and procedures	**Compliance management** **Indicators: business ethics** **Supply chain management**	**Omission reason:** Information unavailable/incomplete **Comment:** Our anti-corruption standard applies to all employees of our company. In addition, we expect all of our suppliers to comply with our Supplier Code of Conduct, which explicitly requires the combat of corruption and bribery. We are reviewing the relevant disclosures for fiscal 2024 in accordance with 205-2-a, 205-2-c and 205-d.
205-3	Confirmed incidents of corruption and actions taken	**Compliance management** **Indicators: business ethics** **Report on Risks and Opportunities**	**Omission reason:** Confidentiality constraints **Comment:** As applicable, we report on risks from litigation and legal proceedings in our Report on Risks and Opportunities. Due to the sensitive nature of corruption incidents and to avoid conclusions about individual cases, we do not report on 205-3-b and 205-3-c.

GRI 206: Anti-competitive Behavior 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
206: 3-3	Management of material topics	**Compliance management** **Interactions with health systems**	
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	**Indicators: business ethics** **Report on Risks and Opportunities**	

Environmental standards

GRI 301: Materials 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
301: 3-3	Management of material topics	**Sustainable products & packaging: Life Science** **Sustainable products & packaging: Healthcare** **Sustainable products & packaging: Electronics**	
301-1	Materials used by weight or volume	**Sustainable products & packaging: Life Science** **Sustainable products & packaging: Healthcare** **Sustainable products & packaging: Electronics**	**Omission reason:** Information unavailable/incomplete **Comment:** We only record the weight of the raw materials that are directly used in our pharmaceuticals and chemicals and are measurable, which came to 387 metric kilotons in 2023 (2022: 416 metric kilotons). Additionally, we utilize operating supplies and packaging materials, such as folding boxes, glass bottles and ampules. A breakdown into 301-1-i and 301-1-ii is currently not possible. We are reviewing a corresponding disclosure for fiscal 2024.
301-2	Recycled input materials used	**Sustainable products & packaging: Life Science** **Sustainable products & packaging: Healthcare** **Sustainable products & packaging: Electronics**	**Omission reason:** Information unavailable/incomplete **Comment:** In all our endeavors, we attempt to efficiently utilize materials and recycle as much as possible. Where feasible, we use recycled materials (in packaging, for instance.). Overall, our company considers material consumption to be a major concern. There are few opportunities to use recycled material in our production processes because our business model puts us at the start of the value chain. We therefore do not collect such data at Group level. We are reviewing consolidation at Group level for fiscal 2024. Individual data and measures are reported in the respective chapters.

GRI Standard and disclosure		Reference	Omission reason and Comment
301-3	Reclaimed products and their packaging materials	**Sustainable products & packaging: Life Science** **Sustainable products & packaging: Healthcare** **Sustainable products & packaging: Electronics**	**Omission reason:** Information unavailable/incomplete **Comment:** Owing to the multitude of products we supply and the minimal comparability of our various initiatives, we do not collect quantitative data at the Group level. We are reviewing consolidation at Group level for fiscal 2024. The individual measures taken by our various businesses are reported in the respective chapters.

GRI 302: Energy 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
302: 3-3	Management of material topics	**Climate action** **Environmental protection** **Sustainable products & packaging: Life Science** **Sustainable products & packaging: Healthcare** **Sustainable products & packaging: Electronics**	
302-1	Energy consumption within the organization	**Climate action** **Indicators: environment**	
302-2	Energy consumption outside of the organization	**Climate action** **Indicators: environment**	**Omission reason:** Information unavailable/incomplete **Comment:** To date, we have not been tracking energy consumption outside our organization, but we are reporting on our Scope 3 emissions.
302-3	Energy intensity	**Climate action** **Indicators: environment**	
302-4	Reduction of energy consumption	**Climate action** **Indicators: environment**	
302-5	Reductions in energy requirements of products and services	**Climate action** **Indicators: environment**	

GRI 303: Water and Effluents 2018

GRI Standard and disclosure		Reference	Omission reason and Comment
303: 3-3	Management of material topics	**Water management** **Environmental protection**	
303-1	Interactions with water as a shared resource	**Water management**	
303-2	Management of water discharge-related impacts	**Water management**	
303-3	Water withdrawal	**Water management** **Indicators: environment**	**Omission reason:** Not applicable **Comment:** The amount of seawater and produced water withdrawn is not significant and is therefore not reported separately. The breakdown of the water withdrawal sources in accordance with the GRI categories “fresh water” and “other water” is not relevant for us owing to the high water quality required and is therefore not reported.
303-4	Water discharge	**Water management** **Indicators: environment**	**Omission reason:** Not applicable **Comment:** The volume of seawater and groundwater discharged is not significant and is therefore not reported separately.
303-5	Water consumption	**Water management** **Indicators: environment**	**Omission reason:** Not applicable **Comment:** Most of the water we use in our production streams is released back into aquatic ecosystems through direct or indirect discharges. Evaporation processes are not a material part of our manufacturing operations. At individual manufacturing sites, we incorporate small amounts of water into our products. We do not operate processes that withdraw water in relevant volumes from the aquatic environment like incorporation in products or evaporation into the atmosphere. Neither do we operate technical installations like water reservoirs with the purpose of water withdrawal. Thus, water consumption is not material to our company.

GRI 304: Biodiversity 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
304: 3-3	Management of material topics	**Environmental protection** **Sustainable products & packaging: Life Science**	
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	**Environmental protection**	**Omission reason:** Information unavailable/incomplete **Comment:** Our land use planning takes biodiversity impacts into account, with appropriate protective measures being taken on a case-by-case basis.
304-2	Significant impacts of activities, products, and services on biodiversity	**Environmental protection** **Materiality analysis**	
304-3	Habitats protected or restored	**Environmental protection**	
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	**Environmental protection**	**Omission reason:** Information unavailable/incomplete **Comment:** Our land use planning takes biodiversity impacts into account, with appropriate protective measures being taken on a case-by-case basis.

GRI 305: Emissions 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
305: 3-3	Management of material topics	**Climate action** **Environmental protection**	
305-1	Direct (Scope 1) GHG emissions	**Climate action** **Indicators: environment**	
305-2	Energy indirect (Scope 2) GHG emissions	**Climate action** **Indicators: environment**	
305-3	Other indirect (Scope 3) GHG emissions	**Climate action** **Indicators: environment** **CDP Climate change**	

GRI Standard and disclosure		Reference	Omission reason and Comment
305-4	GHG emissions intensity	**Climate action** **Indicators: environment**	
305-5	Reduction of GHG emissions	**Climate action** **Sustainable products & packaging: Life Science** **Sustainable products & packaging: Healthcare** **Sustainable products & packaging: Electronics** **Indicators: environment** **CDP Climate change**	
305-6	Emissions of ozone-depleting substances (ODS)	**Indicators: environment**	
305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	**Indicators: environment**	

GRI 306: Waste 2020

GRI Standard and disclosure		Reference	Omission reason and Comment
306: 3-3	Management of material topics	**Waste & recycling** **Environmental protection**	
306-1	Waste generation and significant waste-related impacts	**Waste & recycling**	
306-2	Management of significant waste-related impacts	**Waste & recycling**	
306-3	Waste generated	**Waste & recycling**	
306-4	Waste diverted from disposal	**Indicators: environment**	
306-5	Waste directed to disposal	**Waste & recycling** **Indicators: environment**	

GRI 306: Effluents and Waste 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
306-3	Significant spills	**Waste & recycling**	

GRI 308: Supplier Environmental Assessment 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
308: 3-3	Management of material topics	**Supply chain management** **Mica supply chain**	
308-1	New suppliers that were screened using environmental criteria	**Supply chain management**	**Omission reason:** Not applicable **Comment:** We do not report the "percentage of new suppliers that were screened using environmental criteria" since this information is not relevant for managing our sustainable supplier management activities.
308-2	Negative environmental impacts in the supply chain and actions taken	**Supply chain management** **Mica supply chain**	**Omission reason:** Not applicable **Comment:** We work closely with our strategic suppliers and monitor various risk domains via our supplier risk assessments. In this context, we help our suppliers to achieve improvements and to set up risk mitigation measures. The GRI disclosures 308-2-b, 308-2-d and 308-2-e are not reported since they are not relevant for us.

Social standards

GRI 401: Employment 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
401: 3-3	Management of material topics	**Career with us** **Corporate culture** **Human rights**	
401-1	New employee hires and employee turnover	**Indicators: employees**	
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	**Career with us**	**Omission reason:** Information unavailable/incomplete **Comment:** Part-time employees generally receive the same eligibility for employee benefits as full-time workers. Eligibility may require a minimum level of work hours in some countries. Employees with temporary contracts, however, may not be entitled to all company benefits, such as a company pension.
401-3	Parental leave	**Career with us** **Indicators: employees**	

GRI 402: Labor/Management Relations 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
402: 3-3	Management of material topics	**Corporate culture**	
402-1	Minimum notice periods regarding operational changes	**Corporate culture**	**Omission reason:** Not applicable **Comment:** The regulations on periods of notice vary worldwide. We apply the rules that are in force locally and do not track periods of notice at Group level.

GRI 403: Occupational Health and Safety 2018

GRI Standard and disclosure		Reference	Omission reason and Comment
403: 3-3	Management of material topics	**Health & safety** **Plant, process & transport safety**	**Comment:** The disclosures under GRI 403 pertain to our main employee groups, for example our own employees as well as supervised temporary staff. They do not include employees of contractors. Consequently, not all the employee groups specified by GRI are taken into consideration.
403-1	Occupational health and safety management system	**Health & safety**	
403-2	Hazard identification, risk assessment, and incident investigation	**Health & safety** **Plant, process & transport safety**	
403-3	Occupational health services	**Health & safety**	
403-4	Worker participation, consultation, and communication on occupational health and safety	**Health & safety**	**Comment:** Occupational health and safety committees are required by law in Germany. All employees of Merck KGaA, Darmstadt, Germany, are therefore represented by such committees, which operate at site level. They account for around 6% of our total workforce. The majority of sites outside Germany also have health and safety committees to represent their employees. The organization of these committees is the responsibility of our individual sites. Health and safety issues are governed Group-wide by our EHS Policy. The organizational implementation of this policy is the responsibility of our individual sites and is subject to local laws and regulations. Merck KGaA, Darmstadt, Germany, has company agreements in place on occupational health and safety.
403-5	Worker training on occupational health and safety	**Health & safety** **Plant, process & transport safety**	
403-6	Promotion of worker health	**Health & safety**	
403-7	Prevention and mitigation of occupational health and safety	**Health & safety**	

GRI Standard and disclosure		Reference	Omission reason and Comment
	impacts directly linked by business relationships	**Human rights** **Plant, process & transport safety**	
403-8	Workers covered by an occupational health and safety management system	**Health & safety**	
403-9	Work-related injuries	**Health & safety** **Plant, process & transport safety** **Indicators: employees**	**Comment:** We have identified the lost time injury rate (LTIR) as a key indicator for our company.
403-10	Work-related ill health	**Health & safety** **Plant, process & transport safety** **Indicators: employees**	**Omission reason:** Information unavailable/incomplete **Comment:** At Group level, we do not collect data about the types of potential work-related illnesses or fatalities. Our sites may collect data on occupational illness as needed. We are reviewing consolidation at Group level for fiscal 2024.

GRI 404: Training and Education 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
404: 3-3	Management of material topics	**Career with us** **Diversity, equity & inclusion** **Corporate culture**	
404-1	Average hours of training per year per employee	**Career with us**	**Omission reason:** Not applicable **Comment:** We do not keep track of the average hours our employees spend on vocational training and continuing education because this indicator does not have any bearing on the quality or success of our efforts.
404-2	Programs for upgrading employee skills and transition assistance programs	**Supply chain management** **Human rights** **Product-related crime** **Plant, process & transport safety**	

GRI Standard and disclosure		Reference	Omission reason and Comment
		Career with us **Corporate culture** **Diversity, equity & inclusion** **Environmental protection**	
404-3	Percentage of employees receiving regular performance and career development reviews	**Career with us** **Indicators: employees**	

GRI 405: Diversity and Equal Opportunity 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
405: 3-3	Management of material topics	**Diversity, equity & inclusion** **Career with us** **Objectives of the Supervisory Board**	
405-1	Diversity of governance bodies and employees	**Diversity, equity & inclusion** **Indicators: employees** **The Executive Board** **The Supervisory Board** **Objectives of the Supervisory Board** **Diversity policy**	
405-2	Ratio of basic salary and remuneration of women to men	**Career with us** **Diversity, equity & inclusion**	**Omission reason:** Not applicable **Comment:** As a core principle, our compensation systems and processes do not distinguish between women and men. The salaries we offer are predicated on the respective job description and are based on our Global Job Catalog, which has fixed salary bands that are identical for men and women. Variable salary components that fall under performance-based compensation are paid based on whether mutually agreed targets have been achieved. A

GRI Standard and disclosure		Reference	Omission reason and Comment
			performance management system governs this process.

GRI 406: Non-discrimination 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
406: 3-3	Management of material topics	**Diversity, equity & inclusion** **Corporate culture**	
406-1	Incidents of discrimination and corrective actions taken	**Diversity, equity & inclusion** **Indicators: business ethics**	**Omission reason:** Confidentiality constraints **Comment:** Due to the sensitive nature of discrimination cases and to avoid conclusions about individual cases, we do not report on 406-1-b-iii.

GRI 407: Freedom of Association and Collective Bargaining 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
407: 3-3	Management of material topics	**Supply chain management** **Human rights** **Corporate culture**	
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	**Supply chain management** **Human rights**	

GRI 408: Child Labor 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
408: 3-3	Management of material topics	**Supply chain management** **Mica supply chain** **Human rights**	

GRI Standard and disclosure		Reference	Omission reason and Comment
408-1	Operations and suppliers at significant risk for incidents of child labor	**Supply chain management** **Human rights** **Mica supply chain**	

GRI 409: Forced or Compulsory Labor 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
409: 3-3	Management of material topics	**Supply chain management** **Mica supply chain** **Human rights**	
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	**Supply chain management** **Mica supply chain** **Human rights**	

GRI 410: Security Practices 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
410: 3-3	Management of material topics	**Human rights** **Supply chain management**	
410-1	Security personnel trained in human rights policies or procedures	**Human rights**	**Omission reason:** Information unavailable/incomplete **Comment:** As part of our Security Governance Framework, we plan to integrate human rights aspects even more strongly into security-relevant processes, for instance in training courses for security personnel. To this end, we plan to offer webinars on the topic of human rights on the established Security Academy platform in regular intervals, among other things.

GRI 414: Supplier Social Assessment 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
414: 3-3	Management of material topics	**Supply chain management** **Mica supply chain** **Human rights**	
414-1	New suppliers that were screened using social criteria	**Supply chain management**	**Omission reason:** Not applicable **Comment:** We do not report the "percentage of new suppliers that were screened using social criteria" since this information is not relevant for managing our sustainable supplier management activities.
414-2	Negative social impacts in the supply chain and actions taken	**Supply chain management** **Mica supply chain**	**Omission reason:** Information unavailable/incomplete **Comment:** We work closely with our strategic suppliers and monitor various risk domains via our supplier risk assessment. In doing so, we support our suppliers with improvements and measures to minimise risk. Due to the large number of our suppliers, we do not have data for 414-2-b, 414-2-d and 414-2-e for the entire Group. We are reviewing consolidation at Group level for fiscal 2024.

GRI 416: Customer Health and Safety 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
416: 3-3	Management of material topics	**Clinical studies** **Patient safety** **Product-related crime** **Chemical product safety** **Report on Risks and Opportunities**	
416-1	Assessment of the health and safety impacts of product and service categories	**Chemical product safety**	**Omission reason:** Not applicable **Comment:** All pharmaceuticals are subject to reporting and notification

GRI Standard and disclosure		Reference	Omission reason and Comment
			requirements, which we fulfill. In line with the statutory requirements, we provide our customers with relevant information on the safe handling and use of our chemical products. We report on the individual requirements in the respective chapters.
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	**Clinical studies** **Chemical product safety** **Report on Risks and Opportunities**	**Comment:** As applicable, we report on risks from litigation and legal proceedings in our Report on Risks and Opportunities.

GRI 417: Marketing and Labeling 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
417: 3-3	Management of material topics	**Compliance management** **Interactions with health systems** **Patient safety** **Chemical product safety**	
417-1	Requirements for product and service information and labeling	**Patient safety** **Chemical product safety**	**Omission reason:** Not applicable **Comment:** All pharmaceuticals are subject to reporting and notification requirements, which we fulfill. In line with the statutory requirements, we provide our customers with relevant information on the safe handling and use of our chemical products. We report on the individual requirements in the respective chapters.
417-2	Incidents of non-compliance concerning product and service information and labeling	**Patient safety** **Chemical product safety** **Report on Risks and Opportunities**	
417-3	Incidents of non-compliance concerning marketing communications	**Report on Risks and Opportunities**	**Comment:** As applicable, we report on risks from litigation and legal proceedings in our Report on Risks and Opportunities.

GRI 418: Customer Privacy 2016

GRI Standard and disclosure		Reference	Omission reason and Comment
418: 3-3	Management of material topics	**Data protection & cyber security** **Clinical studies**	
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	**Data protection & cyber security** **Clinical studies** **Indicators: business ethics**	

Additional material topics

Clinical studies

GRI Standard and disclosure		Reference	Omission reason and Comment
3-3	Management of material topics	**Clinical studies**	

Animal welfare

GRI Standard and disclosure		Reference	Omission reason and Comment
3-3	Management of material topics	**Animal welfare**	

Bioethics

GRI Standard and disclosure		Reference	Omission reason and Comment
3-3	Management of material topics	**Bioethics**	

Digital ethics

GRI Standard and disclosure		Reference	Omission reason and Comment
3-3	Management of material topics	**Digital ethics**	

Access to health

GRI Standard and disclosure		Reference	Omission reason and Comment
3-3	Management of material topics	**Global Health** **Innovation sharing** **Health capacity & awareness**	

Prices of medicines

GRI Standard and disclosure		Reference	Omission reason and Comment
3-3	Management of material topics	**Prices of medicines**	

Product-related crime

GRI Standard and disclosure		Reference	Omission reason and Comment
3-3	Management of material topics	**Product-related crime**	

SASB index

SASB disclosure 2023

We included our Sustainability Accounting Standards Board (SASB) disclosures into our Sustainability Report 2023. In addition to our disclosures pursuant to the SASB standard “Biotechnology & Pharmaceuticals”, we voluntarily report information for the “Medical Equipment & Supplies” and “Semiconductors” industries. We thus cover our three business sectors. With our voluntary SASB disclosures, we want to meet the increasing demands of our investors and other stakeholders. The reported data provide transparent, financially material and meaningful information on sustainability of our company. To meet the evolving interests and requirements of our stakeholders in the future as well, we will continuously develop and expand our SASB reporting.

The SASB disclosures were not part of the **limited assurance engagement** conducted by an independent auditor for our 2023 Sustainability Report.

Biotechnology & Pharmaceuticals

Safety of Clinical Trial Participants

Code	Metrics	Reference/Comment
HC-BP-210a.1	Discussion, by world region, of management process for ensuring quality and patient safety during clinical trials	**Clinical studies** **Patient safety** **R&D: Positions & Policies (Healthcare)**
HC-BP-210a.2	Number of FDA Sponsor Inspections related to clinical trial management and pharmacovigilance that resulted in: (1) Voluntary Action Indicated (VAI) and (2) Official Action Indicated (OAI)	In 2023, there were no FDA Good Clinical Practice (GCP) sponsor inspections related to clinical trials. Accordingly, there are no VAI or OAI.
HC-BP-210a.3	Total amount of monetary losses as a result of legal proceedings associated with clinical trials in developing countries	Not reported due to confidentiality constraints/legal prohibitions.

Access to Medicines

Code	Metrics	Reference/Comment
HC-BP-240a.1	Description of actions and initiatives to promote access to health care products for priority diseases and in priority countries as defined by the Access to Medicine Index	**Global Health** **Open Innovation sharing**

Code	Metrics	Reference/Comment
		Prices of medicines **Health capacity & awareness**
HC-BP-240a.2	List of products on the WHO List of Prequalified Medicinal Products as part of its Prequalification of Medicines Programme (PQP)	Currently there is no product on the list.

Affordability & Pricing

Code	Metrics	Reference/Comment
HC-BP-240b.1	Number of settlements of Abbreviated New Drug Application (ANDA) litigation that involved payments and/or provisions to delay bringing an authorized generic product to market for a defined time period	Not reported due to confidentiality constraints.
HC-BP-240b.2	Percentage change in: (1) average list price and (2) average net price across U.S. product portfolio compared to previous year	The following overview shows the percentage change (2023 vs. 2022) in the average list price (WAC) of our Healthcare US product portfolio compared to the previous year (numbers in brackets: 2022 vs. 2021): • Rebif®: 7.3% (4.0%) • Mavenclad®: 4.5% (4.7%) • Bavencio®: 3.8% (3.3%) • Gonal-f®: 7.2% (6.4%) • Cetrotide®: 7.2% (7.3%) • Ovidrel®: 7.2 % (6.4%) • Serostim®: 6.9% (6.1%) • Tepmetko®: 5.5% (4.1%) See also: **Prices of medicines** We do not report any net price for confidentiality reasons.
HC-BP-240b.3	Percentage change in: (1) list price and (2) net price of product with largest increase compared to previous year	We only report the percentage change in average list price across our U.S. product portfolio. The largest increase compared with the previous year amounted to 3.3% for Rebif®. We do not report any net price for confidentiality reasons.

Drug Safety

Code	Metrics	Reference/Comment
HC-BP-250a.1	List of products listed in the Food and Drug Administration's (FDA) MedWatch Safety Alerts for Human Medical Products database	See FDA website: **Safety information and adverse event reporting program** **Adverse event reporting system (FAERS) public dashboard**
HC-BP-250a.2	Number of fatalities associated with products as reported in the FDA Adverse Event Reporting System	See FDA website: **Adverse event reporting system (FAERS) public dashboard**
HC-BP-250a.3	Number of recalls issued, total units recalled	In 2023, we had two drug product recalls in total. None of these recalls was global they affected individual countries only. None of the recalls was related to the USA. None of the recalls was related to serious injury or fatality, all were either Class II or III. According to our internal policies, any recall type is reported and discussed with the relevant national regulatory authority, including the U.S. FDA. All recall processes are managed under a Global Standard Procedure "Product Recall and Withdrawal Management" which is applied worldwide for medicinal products (pharmaceutical prescription, biological) and devices.
HC-BP-250a.4	Total amount of product accepted for take-back, reuse, or disposal	We do not take back products for reuse. In line with legal requirements in each country we take back products for disposal. The take back for disposal is organized on a local level and not tracked at global level.
HC-BP-250a.5	Number of FDA enforcement actions taken in response to violations of current Good Manufacturing Practices (cGMP), by type	We had no such FDA enforcement actions in 2023.

Counterfeit Drugs

Code	Metrics	Reference/Comment
HC-BP-260a.1	Description of methods and technologies used to maintain traceability of products throughout the supply chain and prevent counterfeiting	**Product-related crime**

Code	Metrics	Reference/Comment
HC-BP-260a.2	Discussion of process for alerting customers and business partners of potential or known risks associated with counterfeit products	We have implemented processes and procedures to ensure that all suspected counterfeit medicines are assessed by a team of experts. The scope of any notification that we provide is the outcome of strategic alignment between relevant functions (e.g. Medical, Procurement, Legal, Quality, Corporate Security, Regulatory Affairs, Communications). Levels of details and format of any notification, including the HA information and collaboration, dedicated patient communication, information/ awareness communication to distributors, pharmacies, physicians etc. about the presence of counterfeit or diverted products in the market, is decided on a case-by-case basis in accordance with the identified risks and taking into account corporate, legal and regulatory responsibilities. See also: **Product-related crime**
HC-BP-260a.3	Number of actions that led to raids, seizure, arrests, and/or filing of criminal charges related to counterfeit products	We report the number of actions that lead to filed cases related to counterfeit products to the authorities. For our Group-wide approach to counterfeit products, please see: **Product-related crime**

Ethical Marketing

Code	Metrics	Reference/Comment
HC-BP-270a.1	Total amount of monetary losses as a result of legal proceedings associated with false marketing claims	Not reported due to confidentiality constraints/legal prohibitions.
HC-BP-270a.2	Description of code of ethics governing promotion of off-label use of products	**Patient safety**

Employee Recruitment, Development & Retention

Code	Metrics	Reference/Comment
HC-BP-330a.1	Discussion of talent recruitment and retention efforts for scientists and research and development personnel	Merck is a diverse company with three business sectors. Our Group approach to talent recruitment and retention efforts applies to everyone and does not differentiate between non-scientist and scientist employees.

Code	Metrics	Reference/Comment
		Career with us **Diversity, equity & inclusion**
HC-BP-330a.2	(1) Voluntary and (2) involuntary turnover rate for: (a) executives/ senior managers, (b) mid-level managers, (c) professionals, and (d) all others	We report the overall turnover rate (including voluntary as well as involuntary fluctuation) by gender, age and region. **Indicators: Employees**

Supply Chain Management

Code	Metrics	Reference/Comment
HC-BP-430a.1	Percentage of (1) entity's facilities and (2) Tier I suppliers' facilities participating in the Rx-360 International Pharmaceutical Supply Chain Consortium audit program or equivalent third-party audit programs for integrity of supply chain and ingredients	Our Healthcare business sector does not participate in the Rx-360 International Pharmaceutical Supply Chain Consortium. However, our facilities are frequently audited by the respective health authorities of the countries in which we distribute our healthcare products. As a major supplier to the pharmaceutical industry, our Life Science business sector participates in the **Rx-360 audit program**. Regarding our supplier base, we have access to sustainability audits and assessments of our suppliers through our membership in the industry initiatives**Together for Sustainability**and**Pharmaceutical Supply Chain Initiative**. See also: **Supply chain management**

Business Ethics

Code	Metrics	Reference/Comment
HC-BP-510a.1	Total amount of monetary losses as a result of legal proceedings associated with corruption and bribery	Not reported due to confidentiality constraints/legal prohibitions.
HC-BP-510a.2	Description of code of ethics governing interactions with health care professionals	**Interactions with health systems** **Compliance management**

Activity metrics

Code	Metrics	Reference/Comment
HC-BP-000.A	Number of patients treated	In 2023, our Healthcare products were used to treat around 93 million patients, thereof more than 57 million patients in low- and middle-income countries. Additionally, we donated more than 210 million praziquantel tablets, enough to treat schistosomiasis in around 84 million school-aged children in 2023. See also: **Global Health**
HC-BP-000.B	Number of drugs (1) in portfolio and (2) in research and development (Phases 1-3)	We disclose our drug portfolio and R&D pipeline in the Annual Report and our website: **Our Healthcare portfolio** **Research & Development (Healthcare)** **Our Healthcare pipeline**

Medical Equipment & Supplies

Affordability & Pricing

Code	Metrics	Reference/Comment
HC-MS-240a.1	Ratio of weighted average rate of net price increases (for all products) to the annual increase in the U.S. Consumer Price Index	Not reported due to confidentiality constraints.
HC-MS-240a.2	Description of how price information for each product is disclosed to customers or to their agents	We disclose price information for our products via our website (excluding custom requests): **Life Science portfolio**.

Product Safety

Code	Metrics	Reference/Comment
HC-MS-250a.1	Number of recalls issued, total units recalled	We conduct monthly reviews of key performance quality indicators which include a review of multiple quality metrics including number of recalls. Quarterly trends are evaluated and reported through management reviews.

Code	Metrics	Reference/Comment
		In 2023, there were four recalls for our Life Science business.
HC-MS-250a.2	List of products listed in the FDA's MedWatch Safety Alerts for Human Medical Products database	In 2023, there were no Life Science products listed in the **FDA's MedWatch Safety Alerts for Human Medical Products database**.
HC-MS-250a.3	Number of fatalities related to products as reported in the FDA Manufacturer and User Facility Device Experience database	In 2023, there were no fatalities related to our Life Science products reported to the **FDA's Manufacturer and User Facility Device Experience database**.
HC-MS-250a.4	Number of FDA enforcement actions taken in response to violations of current Good Manufacturing Practices (cGMP), by type	Life Science received three U.S. FDA 483 forms in 2023.

Ethical Marketing

Code	Metrics	Reference/Comment
HC-MS-270a.1	Total amount of monetary losses as a result of legal proceedings associated with false marketing claims	Not reported due to confidentiality constraints/legal prohibitions.
HC-MS-270a.2	Description of code of ethics governing promotion of off-label use of products	Before any products can be purchased from our Life Science platform, we use a customer screening process to guard against the purchase of our products for illegal purposes. Core steps of this process cover data sourcing, hazard assessment, safe-use/risk assessment and labels/safety data sheets. Besides our own process, we cooperate with responsible authorities in the U.S. (FBI and the Bureau of Alcohol, Tobacco, Firearms and Explosives, ATF), as well as international authorities (Interpol). If we become aware that any of our Life Science products is used beyond our marketed intention, we evaluate the situation to determine whether to continue sales or not. Proper use of our products is included in**Terms and Conditions** under "Use of Products". See also: **Patient safety**

Product Design & Lifecycle Management

Code	Metrics	Reference/Comment
HC-MS-410a.1	Discussion of process to assess and manage environmental and human health considerations associated with chemicals in products, and meet demand for sustainable products	We assess environmental, human health, and further sustainability aspects of chemical products that we are sourcing and/or producing and selling. Furthermore, we screen our entire Life Science portfolio against growing demands arising from external stakeholders. For example, in alignment with the European Chemicals Strategy for Sustainability (CSS) we work towards a more sustainable product portfolio. Our Product Stewardship Council drives the transformation of existing products by considering appropriate measures like the substitution of chemical substances. Regarding future products, the selection of benign substance alternatives is done during ideation and early R&D through our Design for Sustainability program. In support of this, we have developed a tool which monitors latest chemical regulations. Besides flagging banned substances, it also flags substances that are already considered critical but not yet regulated. In addition to this, experts of the Chemicals Regulations teams are directly consulted for further insights and advice. See also: **Chemical product safety** **Sustainable Products & Packaging: Life Science**
HC-MS-410a.2	Total amount of products accepted for take-back and reused, recycled, or donated, broken down by: (1) devices and equipment and (2) supplies	Since 2013, we have been partnering with Seeding Labs, a non-profit organization dedicated to equipping scientists in resource-limited countries with scientific equipment and support. In 2023, we donated 153 items of scientific equipment valued at more than $243,102. See also: **Sustainable Products & Packaging: Life Science** **Sustainability and Social Business Innovation**

Supply Chain Management

Code	Metrics	Reference/Comment
HC-MS-430a.1	Percentage of (1) entity's facilities and (2) Tier I suppliers' facilities participating in third-party audit programs for manufacturing and product quality	As a major supplier to the pharmaceutical industry, our Life Science business participates in the Rx-360 audit program. The Life Science facilities are regularly audited by customers and respective health authorities for regulated products. (1) Rx-360 audit programs are conducted across the Life Science business on a multi-year cycle with approximately 15% of our manufacturing facilities audited annually. (2) Approximately 5% of our tier 1 supplier facilities participated in third party audit programs such as Rx-360.
HC-MS-430a.2	Description of efforts to maintain traceability within the distribution chain	**Product safety (Life Science)** **Quality & regulatory management (Life Science)** For our Group-wide approach see also: **Product-related crime**
HC-MS-430a.3	Description of the management of risks associated with the use of critical materials	**Supply chain management** **Mica supply chain** **Chemical product safety** **Report on risks and opportunities**

Business Ethics

Code	Metrics	Reference/Comment
HC-MS-510a.1	Total amount of monetary losses as a result of legal proceedings associated with bribery or corruption	Not reported due to confidentiality constraints/legal prohibitions.
HC-MS-510a.2	Description of code of ethics governing interactions with health care professionals	**Interactions with health systems** **Compliance management**

Activity metrics

Code	Metrics	Reference/Comment
HC-MS-000.A	Number of units sold by product category	Not reported

Semiconductors

Greenhouse Gas Emissions

Code	Metrics	Reference/Comment
TC-SC-110a.1	(1) Gross global Scope 1 emissions	**Climate action** **Indicators: Environment**
	(2) amount of total emissions from perfluorinated compounds	**CDP Climate change**
TC-SC-110a.2	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	**Climate action**

Energy Management in Manufacturing

Code	Metrics	Reference/Comment
TC-SC-130a.1	(1) Total energy consumed	We report our total energy consumed in terajoule (TJ) and gigawatt hours. (1 gigajoule = 0.001 TJ): **Indicators: Environment** **Climate action**
	(2) percentage grid electricity	42% (2022: 40%) See also: **Indicators: Environment**
	(3) percentage renewable	**Indicators: Environment** **Climate action**

Water Management

Code	Metrics	Reference/Comment
TC-SC-140a.1	(1) Total water withdrawn	We report our total water withdrawn in millions of cubic metres. (1 thousand m^3 = 0.001 million m^3): **Indicators: Environment** **Water management**
	(2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	**Water management** **CDP Water Security**

Waste Management

Code	Metrics	Reference/Comment
TC-SC-150a.1	Amount of hazardous waste from manufacturing, percentage recycled	We report our waste figures in metric kilotons. (1 metric ton = 0.001 metric kilotons): **Indicators: Environment**

Employee Health & Safety

Code	Metrics	Reference/Comment
TC-SC-320a.1	Description of efforts to assess, monitor, and reduce exposure of employees to human health hazards	**Health & safety**
TC-SC-320a.2	Total amount of monetary losses as a result of legal proceedings associated with employee health and safety violations	Not reported due to confidentiality constraints/legal prohibitions.

Recruiting & Managing a Global & Skilled Workforce

Code	Metrics	Reference/Comment
TC-SC-330a.1	Percentage of employees that are (1) foreign nationals and	We recruit, hire, train and promote our employees based on diversity, equity and inclusion. We report the number of employees by region, the number of

Code	Metrics	Reference/Comment
		nationalities and the percentage of non-Germans in management positions on Group level. **Indicators: Employees** **Diversity, equity & inclusion**
	(2) located offshore	We recruit, hire, train and promote our employees based on diversity, equity and inclusion. We report the number of employees by region, the number of nationalities and the percentage of non-Germans in management positions on Group level. **Indicators: Employees** **Diversity, equity & inclusion**

Product Lifecycle Management

Code	Metrics	Reference/Comment
TC-SC-410a.1	Percentage of products by revenue that contain IEC 62474 declarable substances	Not reported
TC-SC-410a.2	Processor energy efficiency at a system-level for: (1) servers,	Not applicable
	(2) desktops,	Not applicable
	(3) laptops	Not applicable

Materials Sourcing

Code	Metrics	Reference/Comment
TC-SC-440a.1	Description of the management of risks associated with the use of critical materials	**Research & Development (Electronics)** **Report on risks and opportunities**

Intellectual Property Protection & Competitive Behavior

Code	Metrics	Reference/Comment
TC-SC-520a.1	Total amount of monetary losses as a result of legal proceedings associated with anti-competitive behavior regulations	Not reported due to confidentiality constraints/legal prohibitions.

Activity metrics

Code	Metrics	Reference/Comment
TC-SC-000.A	Total production	Not reported
TC-SC-000.B	Percentage of production from owned facilities	Not reported

TCFD report

Task Force on Climate-related Disclosures (TCFD) 2023

In our TCFD-disclosure for the year 2023 we are describing the climate-related risks and opportunities that impact our business. It elucidates the potential impact of climate change scenarios on our operations and delineates our strategy to address these effects, emphasizing our commitment to resilience in the face of evolving challenges.

The structure of this report adheres to the TCFD recommendations. Consequently, it encompasses our governance structures, strategy, risk management, assessment of resilience, metrics and targets, along with a summary of our environmental performance.

Governance

Leadership and responsibilities in Climate Strategy

Our Executive Board has Group-wide responsibility for our sustainability strategy. This includes the responsibility for climate-related issues, e.g. setting our climate protection targets. 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 Merck Sustainability Board, sponsored by the CEO, 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. Amongst others, it is responsible for integrating climate-related issues into the company's strategy and monitoring progress against climate-related corporate targets.

Incentives for the Executive Board's progress towards achieving our scope 1 and 2 company targets are key elements in our overall sustainability strategy, as they will impact the entire organization (e.g., there are GHG reduction targets on various levels) and help us reach our SBTi approved 1.5°C near-term goals for 2030. For this, we have defined key indicators for the Executive Board on climate-related issues.

Starting from fiscal year 2022, our sustainability targets are considered in the Long-Term Incentive Plan (LTIP) by adding a sustainability factor to the existing three financial performance indicators. It measures the performance of three selected sustainability goals over a period of three years, in this way, the target achievement resulting from the financial performance indicators is adjusted up or down by up to 20%. Details on how this sustainability factor is calculated can be found in the **Compensation Report**.

Coordinated sustainability oversight

The Merck Sustainability Board 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 ensures that initiatives of our various business sectors, Group functions and subsidiaries align with our global sustainability strategy and recommends corresponding initiatives to the Executive Board. It is led by the head of Group Corporate Sustainability, which is chaired by the Head of SQ, who simultaneously serves as Chief Sustainability Officer. The Merck Sustainability Board meets monthly, the performance on Key Indicators is reviewed quarterly. Further, SQ coordinates and steers activities to implement our climate protection program to reach our 2030 and 2040 climate targets. For instance, SQ regularly monitors GHG emissions using a central IT platform and tracks the implementation of energy efficiency and GHG reduction projects.

Our governance structure

Strategy

While a scenario analysis cannot predict the future with certainty, it serves as a crucial tool for understanding the potential impacts of climate change on our business. This analytical approach is essential for risk management, strategic planning, and assessing our overall resilience to potential challenges. In 2023, we dedicated efforts to enhance both qualitative and quantitative climate modeling, establishing a baseline for a comprehensive transition plan.

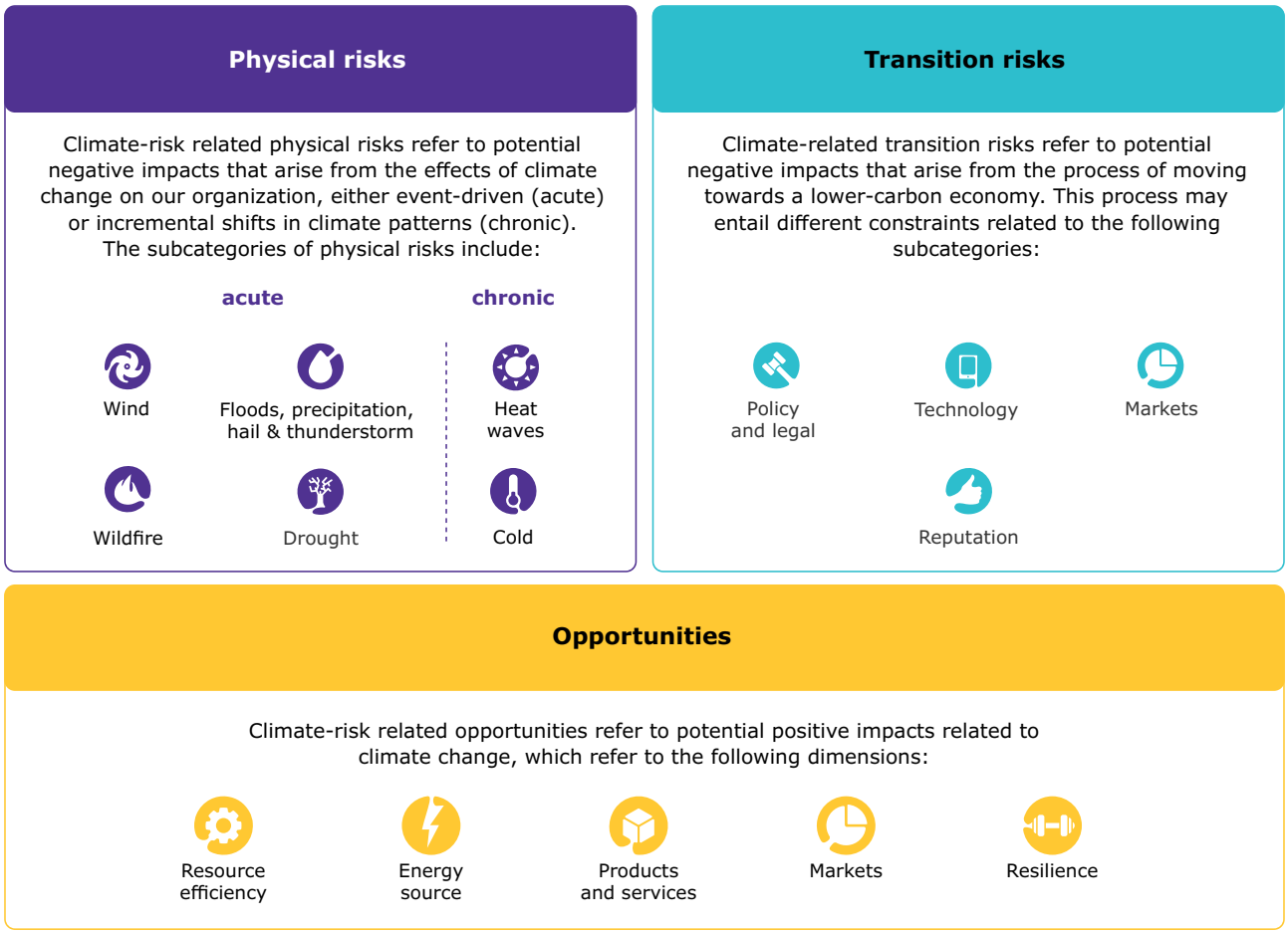
In the following, we outline our methodology, the foundational assumptions guiding our approach, and the resulting insights. The conclusion encompasses an assessment of our resilience, considering the opportunities we have explored, and outlines the strategic actions we intend to pursue.

Climate-assessment approach

Further advancing on our qualitative scenario analysis from 2022, we conducted a quantitative study in 2023 supported by external consultants. Part of this was an in-depth scenario analysis based on which we have assessed transitional and physical risks and opportunities for our business. We considered climate-related transition and physical risks across the different regions in which we operate.

Climate risks and opportunities can be defined as “potential financial value impact as a result of climate change”. According to the TCFD climate impacts are typically grouped into the following categories:

Distinguishing physical and transition risks as well as opportunities



Our forward-looking climate projections are based on assumptions about the future trajectory of greenhouse gas emissions, with different scenarios used for this analysis, as in the Intergovernmental Panel on Climate Change (IPCC) reports. Depending on global climate action, demographics, social aspects, geopolitics, and technology development (to name a few factors), the effective greenhouse gases emitted may vary from the scenarios used.

Our climate risks and opportunities were modelled along the well-established scenarios by the IPCC. We examined the risks and opportunities associated with transitioning to a 1.5°C scenario and a 4°C scenario, represented by RCP 8.5. These scenarios project temperature increases by 2100 compared to pre-industrial levels. Our modeling timeframe extended to the year 2050. We consider 2030 as the near term and 2050 as the mid-to-long-term horizons.

Our scenarios, approach and methodology

Scenario's application in our analysis	Transition risk	Physical risk
Scenario details	1.5°C warming	4°C warming (RCP 8.5)
Economic Constraints	Aligned to SSP2: ◆ Global population growth is moderate and levels off in the second half of the century ◆ GDP continues to grow in line with historical trends ◆ Resource and intensity of energy use declines as productivity increases due to new technologies	No economic constraints for the physical risk
Decarbonisation trends	Global decarbonisation trajectory in line with achieving 1.5°C pathway. Emissions are expected to decrease dramatically before 2030, with net-zero reached around 2040-2050	Emissions continue to increase in line with current business-as-usual pathway. Emissions expected to double by 2050 and triple by 2100.
Policy Expectations	◆ Up to 2030, Nationally Determined Contributions (NDCs) are successfully delivered by countries as pledged in the 2015 Paris Agreement and consolidated into a pledge pipeline. ◆ Post-2030, cost-effective emission reduction measures are implemented by countries to achieve the global 1.5°C target, in proportion to their pledged NDCs.	No further climate policy intervention. Government or state intervention on climate change does not exceed current levels.
Physical Impacts	Very little increase in severe climate-related weather events. In these calculations, it is assumed zero.	Likely increased severity of climate-related weather events.

Source: KPMG Climate IQ
It should be noted that the scenarios presented herein are hypothetical constructions commensurate with a given climate outcome – for the purposes of highlighting sensitivity between climate scenarios.

For our physical risk assessment, we considered to which extent the total insured value of assets is associated with high or very high hazard levels at a certain time and warming scenario. For this, we considered hazard information, exposure data as well as forward-looking climate data, which was provided by our external partners.

We considered the importance and feasibility of accurately quantifying economic and financial impacts in our modeling. To this aim, we identified the top 100 clusters of sites in our portfolio based on their size and significance.

For each scenario, we modelled the economic transition impacts across sectors, regions and time periods. For each projection, multiple variables were calculated, including, demand and supply of labour and capital, carbon emissions, economic production, output volumes and price changes. Likewise, for the financial assessment, impacts for each area, including costs for direct labour, electricity, emissions, raw materials, and revenue were calculated.

Climate-related risks and opportunities and their impact on the organization

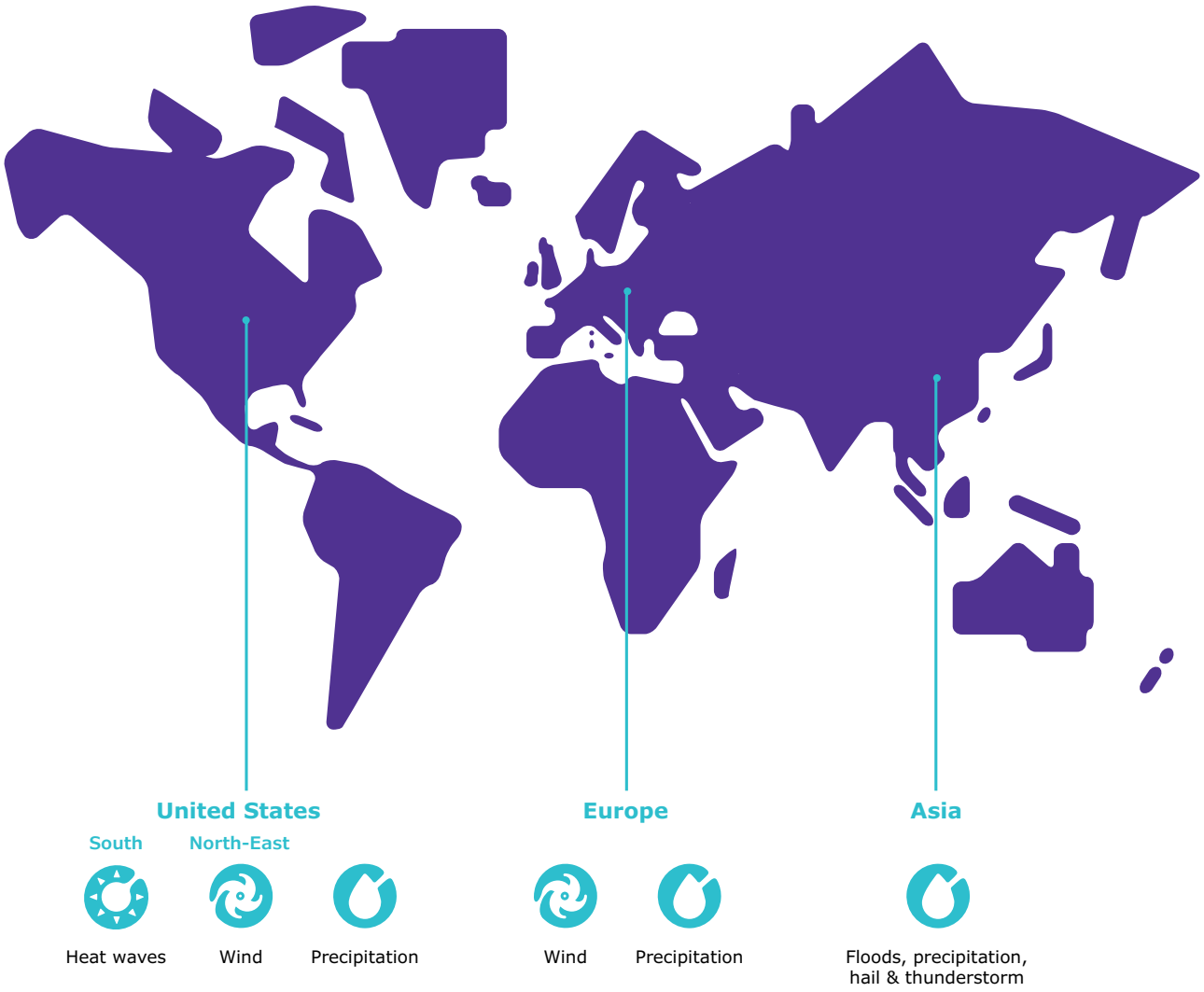
Physical risks

The IPCC finds that human activity has unequivocally caused warming on a global scale. Gradual changes, including rising sea levels and sustained changes to temperature and precipitation can pose chronic physical risks to companies.

Further, extreme weather events (acute physical risks) such as heavy precipitation, heatwaves or tropical cyclones have become more frequent and intense in recent years. Such trends are expected to continue in direct relationship with global temperature rise and could impact our business through physical damage to sites, equipment or stock, and disruptions to operations including internal and external supply networks and employee safety, among other impacts.

Looking at our 100 most important site clusters, based on their total insured value (TIV), we identified the top perils, which may impact them, and how those may develop over time.

Countries and regions considered, as well as their most important risk



Physical risk impact by time horizon and climate scenario

Physical risks	Scenario	2030	2050
Precipitation	**Base case**	🟡	🟡
	4°C	🟡	🟡
Wind	**Base case**	🟡	🟡
	4°C	🟡	🟡
Drought	**Base case**	🟢	🟢
	4°C	🟢	🟡
Thunderstorms	**Base case**	🟢	🟢
	4°C	🟡	🟡
Flood	**Base case**	🟢	🟢
	4°C	🟢	🟢
Heat	**Base case**	🟢	🟢
	4°C	🟢	🟢
Wildfires	**Base case**	🟢	🟢
	4°C	🟢	🟢
Cold	**Base case**	🟡	🟢
	4°C	🟡	🟢
Hail	**Base case**	🟢	🟢
	4°C	🟢	🟢

Legend:
Orange: 20% or more of the Total Insured Value (TIV) of the cluster of site falls within the high or very high hazard level
Green: Less than 20% of the Total Insured Value (TIV) of the cluster of site falls within the high or very high hazard level

Key transition risks

Risks	Description
Scope 1 Emission costs	Our emission and electricity costs could increase in a low carbon transition as a result of carbon price rises, electricity price changes, and differences in electricity consumption.
Electricity costs	
Labour costs	Our overall direct labour costs could increase in a low carbon transition, which could be driven by the economic growth increasing faster than labour supply growth, putting upward pressure on wages.

Key transition opportunities

Opportunities	Description
Revenue	We could experience increased revenue growth in all key geographies with the greatest impact in the USA and Asia.
Chemicals costs	We could benefit from lower costs of chemicals under 1.5°C scenario, compared to the base case.

Transition risks selected for analysis

RO1 Opportunity for increased revenue

RO2 Risk due to carbon taxes and emissions trading

RO3 Risk due to increased cost of electricity

RO4 Risk due to increased cost of labour

RO5 Risk due to increased cost of chemicals

Across a time horizon out to 2050, we found that the impact of physical risk on our sites is limited under a 4°C scenario. In fact, the financial impact of the physical risk is projected to be significantly lower than the impact of transition risk.

Having conducted a first stage quantitative scenario analysis with established levels of impact, we will now use the results to define mitigation leavers for the most significant risks that could occur. The data and findings of the climate-related risk and opportunity assessment will form the foundation for our transition plan to further integrate climate-related issues in our decision-making, planning and strategy.

Our strategic response and resilience assessment:

Transition to a low-carbon economy

One of our core strategic sustainability objectives revolves around "reducing our ecological footprint," targeting a 50% reduction in both direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions by 2030, compared to 2020. Moreover, we aim to reduce our **Scope 3** emissions across the entire value chain by 52% (per euro of gross profit) by 2030. In addressing potential transitional and physical risks in our supply chain, we started a Supplier Decarbonization Program. In addition, we actively seek greener raw materials to integrate into our products, processes, packaging, and buildings. These programs aims to reduce greenhouse gas emissions associated with purchased goods and services, including capital goods.

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.

Looking ahead to 2040, our overarching objective is to attain climate-neutral operations across our entire value chain, encompassing Scope 1, 2, and 3 emissions. To realize these commitments, climate-related considerations are integrated into all aspects of our businesses, supported by a comprehensive set of measures.

Innovation and sustainable products

The sustainable innovation we actively promote aligns with the three core goals outlined in our sustainability strategy. In our pursuit of sustainability, we recognize the pivotal role of Research and Development (R&D) within the realm of science and technology to create sustainable products. Aligned with our sustainability strategy, evaluating our R&D projects regarding their sustainability impact along the value chain is an integral part of our global product development process across the whole organization. We have assessed the majority of relevant R&D projects and consolidated the insights gained from our Design for Sustainability scorecards such as emissions, waste, water, substances of concern and human progress data.

Recognizing the integral role of sustainable products, we acknowledge their significance in mitigating transition risks, such as reputation concerns, while simultaneously capitalizing on opportunities arising from climate change, such as increased revenue through elevated demand for sustainable products. This underscores the strategic importance of embedding sustainability into our innovation processes to navigate challenges and leverage emerging opportunities in the dynamic business landscape.

Carbon Pricing

Furthermore, we incorporate GHG emissions criteria into our investment decisions above 10 Mio Euro. To assess the potential impact of carbon emissions, we use a shadow price, representing a hypothetical cost of carbon per ton of CO_2eq. This helps to understand risks and opportunities across operations, aiding strategic decision-making for future capital investments and mitigating transitional risks, such as those stemming from increased carbon prices.

Given the increasing global adoption of carbon pricing mechanisms, affecting our operations across 66 countries, we are proactively investing in energy efficiency and greenhouse gas reduction measures to mitigate policy-related transition risks and reduce operational costs.

To stay ahead of emerging trends and challenges, we closely monitor global developments, integrating them into our climate scenarios. We engage in dialogues, initiatives, and consultations with industry peers, customers and other stakeholders.

Looking ahead

We are convinced that sustainable entrepreneurship and profitable growth are seamlessly intertwined. Our commitment to accelerating the transition to a low-carbon economy aligns with a broader dedication to advancing our sustainability strategy. In 2023, a thorough quantitative climate-risk assessment has equipped us with an understanding of potential climate-related exposure and opportunities within our operations.

With this insight, we are poised to make well-informed strategic decisions, enhancing our risk management by acknowledging potential exposure across various climate scenarios. Additionally, we aim to identify revenue opportunities stemming from the ongoing transition to a low-carbon economy. A comprehensive transition plan, which we aim to develop in 2024, will guide us in outlining a decarbonization pathway to both mitigate risks and capitalize on climate-related opportunities. Looking forward, we are committed to further integrating

climate risks and opportunities into our decision-making processes and strategies, extending to financial planning and performance considerations.

Risk Management

We recognize that climate change introduces both risks and opportunities that could affect our entire value chain and business operations over the short and long term. Climate-related risks are included in our Group-wide Risk Management, assessed according to our guidelines, and categorized under pre-defined groups like "sustainability and safety risks." We internally evaluate and report on risk-mitigating measures, which may involve transferring risks, reducing impact or probability, and obtaining additional insurance, all crucial for effective risk management.

Our Business Continuity Management, part of our overall risk assessment, addresses long-term risks such as those related to climate change. We also monitor regulatory risks associated with transitioning to a low-carbon economy, anticipating potential impacts from rising carbon prices, emissions trading systems, taxes, or energy legislation in the mid- and long-term.

While we are taking the described steps, we are still working on our approach to managing climate risks. Until now, our focus has been on selectively managing specific aspects. Nevertheless, we remain committed to continually incorporating the risks and opportunities posed by climate change into our evolving risk management strategies.

Metrics & Targets

We are committed to transparently reporting on our environmental goals and the impact of climate change on our business. To implement our long-term climate strategy, we are focusing on reducing our impact from greenhouse gas emissions, water, and waste and building resilience in our businesses. Metrics and targets are important tools to measure and track our progress in achieving our environmental goals. Therefore, we have set specific targets and metrics to measure and improve our environmental performance.

For further information please see the **Indicators section** of our report.

Assurance report

Limited assurance report of the Independent Practitioner regarding the sustainability report of Merck Kommanditgesellschaft auf Aktien for the financial year from January 1 to December 31, 2023

To Merck Kommanditgesellschaft auf Aktien, Darmstadt/Germany

Our Engagement

We have performed a limited assurance engagement on the sustainability report of Merck Kommanditgesellschaft auf Aktien, Darmstadt/Germany, (hereafter referred to as “the Company” or “Merck”), for the financial year from January 1 to December 31, 2023 (hereafter referred to as “sustainability report”).

Our assurance engagement neither covered the chapter “**SASB index**”, nor any of the disclosures related to prior periods nor references to external sources of documentation and websites, including their contents. Nor did our engagement cover the remuneration report referred to in the sustainability report.

Responsibilities of the Executive Directors

The executive directors of the Company are responsible for the preparation of the sustainability report in accordance with the principles stated in the Sustainability Reporting Standards of the Global Reporting Initiative (hereafter referred to as “GRI Principles”) and with the recommendations of the Task Force on Climate-related Financial Disclosures (hereafter referred to as “TCFD”) (altogether referred to as “relevant criteria”).

These responsibilities of the executive directors include the selection and application of appropriate methods for sustainability reporting and the use of assumptions and estimates for individual sustainability disclosures which are reasonable under the given circumstances. In addition, the executive directors are responsible for such internal control as they have determined necessary to enable the preparation of a sustainability report that is free from material misstatement, whether due to fraud (i.e., fraudulent sustainability reporting) or error.

The preciseness and completeness of environmental data in the sustainability report is subject to inherent existing restrictions resulting from the way how the data was collected and calculated and from assumptions made.

Independence and Quality Assurance of the Independent Practitioner

We have complied with the German professional requirements on independence as well as other professional conduct requirements.

Our firm applies the national statutory rules and professional pronouncements – particularly of the "Professional Charter for German Public Auditors and German Sworn Auditors" (BS WP/vBP) and of the Quality Management Standards issued by the Institute of Public Auditors in Germany (IDW) – and accordingly maintains a comprehensive quality management system that includes documented policies and procedures with regard to compliance with professional rules of conduct, professional standards, as well as relevant statutory and other legal requirements.

Responsibilities of the Independent Practitioner

Our responsibility is to express a conclusion on the sustainability report based on our work performed within our limited assurance engagement.

We conducted our work in accordance with the International Standard on Assurance Engagements (ISAE) 3000 (Revised): "Assurance Engagements Other than Audits or Reviews of Historical Financial Information", issued by the IAASB. This Standard requires that we plan and perform the assurance engagement so that we can conclude with limited assurance whether matters have come to our attention that cause us to believe that the sustainability report of the Company, other than the chapter "**SASB index**", any disclosures related to prior periods and references to external sources of documentation and websites, including their contents, as well as the aforementioned remuneration report, has not been prepared, in all materials respects, in accordance with the relevant GRI Criteria.

The procedures performed in a limited assurance engagement are less in extent than for a reasonable assurance engagement; consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. The selection of the assurance procedures is subject to the professional judgment of the independent practitioner.

Within the scope of our limited assurance engagement, which we performed in the months from October 2023 to March 19, 2024, we have, among other things, performed the following assurance procedures and other activities:

- Gaining an understanding of the structure of the Group's sustainability organization and stakeholder engagement,
- Inquiries of the executive directors and relevant employees involved in the preparation process about the preparation process, about the internal controls related to this process and about disclosures in the sustainability reporting,
- Inquiries of the employees responsible for the materiality analysis on group level to obtain an understanding about the process to identify significant topics and corresponding reporting boundaries,
- Risk analysis, including a media analysis, on relevant information about the sustainability performance in the reporting period,

- Evaluation of data collection, validation and reporting processes as well as of the reliability of the reported data based on samples taken as part of site visits (also remote),
- Identification of likely risks of material misstatements in the sustainability report based on the relevant criteria,
- Analytical evaluation of the disclosures in the sustainability report,
- Reconciliation of selected disclosures with the corresponding data in the consolidated financial statements and the annual financial statements and combined management report,
- Consultation of selected internal and external documents,
- Evaluation of the presentation of the sustainability report,
- Evaluation of the implementation of the TCFD's recommendations as part of the climate-related reporting on governance, strategy and risk management as well as key ratios and targets,
- Assessment of climate-related scenarios for plausibility based on inquiries of responsible employees and consultation of relevant documents,
- Evaluation as to whether the stated GRI implementation option is consistent with the key ratios in the sustainability report.

Practitioner's Conclusion

Based on the work performed and the evidence obtained, nothing has come to our attention that causes us to believe that the sustainability report of the Company for the financial year from January 1 to December 31, 2023 has not been prepared, in all material respects, in accordance with the GRI Principles and with the recommendations of the TCFD.

Our conclusion does not relate to the chapter "**SASB index**", any of the disclosures related to prior periods or references to external sources of documentation and websites, including their contents, nor to the remuneration report referred to in the sustainability report.

Restriction of Use

We issue this report as stipulated in the engagement letter agreed with the Company (including the "General Engagement Terms for Wirtschaftsprüfer and Wirtschaftsprüfungsgesellschaften (German Public Auditors and Public Audit Firms)" as of January 1, 2017 promulgated by the Institut der Wirtschaftsprüfer (IDW)). We draw attention to the fact that the assurance engagement was conducted for the Company's purposes and that the report is intended solely to inform the Company about the result of the assurance engagement. Consequently, it may not be suitable for any other purpose than the aforementioned. Accordingly, the report is not intended to be used by third parties for making (financial) decisions based on it.

Our responsibility is to the Company alone. We assume no responsibility with regard to any third parties. Our conclusion is not modified in this respect.

Frankfurt am Main/Germany, March 19, 2024

Deloitte GmbH
Wirtschaftsprüfungsgesellschaft

Signed:
Daniel Oehlmann
Wirtschaftsprüfer
(German Public Auditor)

Signed:
Jan Joos
Wirtschaftsprüfer
(German Public Auditor)

TRANSLATION
– German version prevails –

Glossary

(Q)SAR

Structure-activity relationship (SAR) and quantitative structure-activity relationship (QSAR) models – collectively referred to as (Q)SARs – are mathematical models that can be used to predict the physicochemical, biological and environmental fate properties of compounds from the knowledge of their chemical structures. These models are available for free or as commercial software.

Arpraziquantel

Arpraziquantel is a l new pediatric treatment option for schistosomiasis for children aged 3 months to 6 years of age. It aims to broaden the range of treatment options to address the need of preschool-age children affected by schistosomiasis. It contains the pharmacologically active enantiomer of praziquantel. The new tablet is small and dispersible in water; it has taste properties that are acceptable for the young children and withstands the challenges of a tropical climate.

BIPOC

This abbreviation stands for Black, Indigenous, and people of color. Pronounced “bye-pock,” this is a term specific to the United States, intended to center the experiences of Black and Indigenous groups and demonstrate solidarity between communities of color.

Base case

The base case scenario refers to a 2.5°C degrees warming scenario.

Big Data

Large data sets that may be analyzed computationally to reveal patterns, trends and associations, especially relating to human behavior and interactions.

Biodiversity

The diversity of ecosystems, habitats and landscapes on earth, the diversity of species, and the genetic diversity within a biological species or population.

CO2 equivalents

CO_2 equivalents (CO_2eq) indicate how much a specified quantity of a specific greenhouse gas contributes to the greenhouse effect using the global warming potential of carbon dioxide as a reference.

CRISPR/Cas

A biomolecular method for targeting, cutting and editing the DNA of an organism (gene editing). Experts think this technique has great potential for curing diseases or generating plants and animals with new traits.

Cyber security risk

Potential loss or harm resulting from a cyberattack or data breach related to technical infrastructure, use of technology.

Cyberattack

Any intentional unauthorized attempt to access an information and communication technology or operational technology systems for malicious purposes such as data theft or modification, malware injection, or the initiation of additional attacks.

Data breach

Data breaches are defined as unintentional loss, destruction or unauthorized or unlawful processing of personal data

Dimethyl sulfoxide (DMSO)

A non-toxic organosulfur compound with the formula $(CH_3)2SO$. This colorless liquid is an important polar aprotic solvent that dissolves both polar and nonpolar compounds and is miscible in a wide range of organic solvents as well as water. It is used in various medicinal applications and in research.

Due diligence

Due diligence means a risk analysis exercised with particular care that is done in preparation for a business transaction, e.g. an acquisition.

EHS

Short for “Environment, Health and Safety”, this refers to environmental management, health protection and occupational safety throughout a company.

Employee Assistance Program

The EAP is a confidential telephone 24/7 counselling service providing an independent and holistic support program for our employees. Employees can approach the EAP for help with a range of issues, providing short-term counselling and support if they are experiencing stress, anxiety, depression, relationship problems, or other personal or work-related issues.

End-user declaration

An end-user declaration is a binding customer declaration regarding the intended use of a product.

Endemic countries

Countries in which a certain disease, in many cases an infectious disease, is prevalent.

Environmental, Social, and Corporate Governance (ESG)'

ESG represents an evaluation of a company’s collective conscientiousness for environmental, social and governance factors. An ESG score is compiled from data collected surrounding specific metrics related to intangible assets within the enterprise.

Equality Act

A pending United States law with a special focus on LGBTQI+ people (lesbian, gay, bisexual, transgender, queer or questioning, intersex, and additional self-identifying members of the community). It prohibits discrimination on the basis of gender, sexual orientation and gender identity.

Exposure assessment

Exposure assessment aims to make a quantitative or qualitative estimate of the dose / concentration of the substance to which humans and the environment are or may be exposed. Exposure assessment under REACH consists of two steps: 1) development of exposure scenarios and 2) exposure estimation. These steps must be iterated until it can be concluded that the resulting exposure scenarios would ensure adequate control of risks upon implementation.

Freshwater

Water containing 1,000 mg or less of dissolved solids per liter.

GEM

This abbreviation stands for the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. This initiative offers MS (Master of Science) and Ph.D. (Doctor of Philosophy) level students an access to Engineering and Science firms and Universities in the US.

GHS

Short for “Globally Harmonized System of Classification and Labelling of Chemicals”. This refers to an international standard system to classify chemicals. It covers labeling as well as safety data sheets.

Generative AI

AI that is typically built using special computer models and has capabilities that earlier AI did not have, such as the ability to generate content.

Germline

The cell sequence from which the germ cells (oocytes and sperm) arise within the individual development of multicellular animals and humans. The somatic cell lines branching off from the germ line form the body (the soma).

Good clinical practice (GCP)

An international quality standard issued by the “International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use” (ICH) that describes the responsibilities and expectations of all involved participants (e.g. sponsors, investigators, and ethics committees) in the conduct of clinical studies. The standard covers aspects of the design, implementation, oversight, recording, and reporting of clinical studies.

Good distribution practice (GDP)

An EU guideline that regulates the proper distribution of medicinal products for human use.

Good manufacturing practice (GMP)

A system for ensuring that products are consistently

manufactured and controlled according to quality standards. These guidelines are used in the production of medicines, active pharmaceutical ingredients and cosmetics, as well as food and animal feed.

Greenhouse gases

Gases in the atmosphere that contribute to global warming. They can be either naturally occurring or caused by humans (such as CO_2 emissions generated by burning fossil fuels).

ISO 14001

This international environmental management standard sets globally recognized requirements for an environmental management system.

ISO 45001

This international standard defines globally recognized requirements for an occupational health and safety management system.

ISO 50001

This international standard defines globally recognized requirements for energy management systems.

In vitro

In vitro (latin for in glass, or in the glass) studies are performed outside of a living organism with microorganisms, cells, or biological molecules. In-vivo studies in contrast are performed in a living organism.

In vivo

Latin for “within the living”, this term describes processes that take place within a living organism.

Investigational drug

A pharmaceutical form of an active ingredient or placebo being tested or used as a reference in a clinical trial, including approved as well as unapproved products when used or assembled (formulated or packaged) in a way different from the approved form, when used for an unapproved indication, or when used to gain further information about an approved use.

LGBTQI+

This abbreviation stands for Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, Intersex, and additional self-identifying members of the community.

LOC

This abbreviation stands for Leaders of Color.

LTIR

The lost time injury rate measures the number of accidents resulting in missed days of work (one or more days) per one million working hours.

Liquid crystals (LC)

A hybrid of a crystalline and liquid state. In general, molecules are perfectly arranged only when in a solid crystal state, in contrast to the liquid state, when they move around chaotically. However, liquid crystals are a hybrid of the two states: Although they are liquid, they exhibit a certain crystalline arrangement. Their rod-shaped molecules align themselves like a shoal of fish. In addition, they respond to the electromagnetic waves of light like tiny antennae. Therefore, such swarms of molecules can either allow specially prepared “polarized” light to pass through, or they can block it. This takes place in the pixels of liquid crystal displays. A similar phenomenon occurs in liquid crystal windows, which can provide shade against sunlight.

Location-based approach

Location-based figures are calculated on the basis of the average emission factors of the area in which the electricity consumption takes place. In most cases, this method utilizes the national average.

Managing director

This individual is ultimately responsible for ensuring that our subsidiaries, including R&D and manufacturing centers, comply with all applicable laws and regulations, including applicable internal guidelines.

Market-based approach

Marked-based figures are calculated on the basis of emission factors provided by electricity suppliers specifically for the electricity they sell.

Mindfulness Community

This group of employees, including the Mindfulness Ambassadors, regularly exchanges on the topic of mindfulness (awareness technique for stress regulation) with the aim of anchoring the topic in the workforce.

NMP

N-Methyl-2-pyrrolidone is a polar aprotic compound that is miscible with water and has good solvency properties. NMP is used in the manufacture of polymers, semiconductors, batteries, and pharmaceuticals. The ECHA (European Chemicals Agency) has designated NMP as a substance of very high concern (SVHC) and included it in the candidate list for authorization.

Neglected tropical disease (NTD)

Neglected tropical diseases affect more than 1 billion people in primarily poor populations living in tropical and subtropical climates in low- and middle-income countries. NTDs include schistosomiasis, intestinal worms, trachoma, lymphatic filariasis, and onchocerciasis. This group of 20 diseases is called neglected because, despite the large number of people affected, they have historically received less attention and research funding than other diseases.

Neuromorphic computing

Neuromorphic computing aims at processing information similar to the human brain. Like in the human brain neuromorphic computing systems use an architecture where the memory and the processing units are co-located within the same hardware element and interlinked in a network. These elements are called memristors and can both store and process information.

No-effect threshold

The no-effect threshold is defined as the concentration of a given substance below which no adverse effects to species in water can be expected. The respective values are derived from eco-toxicological studies according to recognized scientific standards.

Non-communicable disease (NCD)

Non-communicable diseases tend to be of long duration and are the result of a combination of genetic, physiological, environmental, and behavioral factors. The main types of NCD are cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes. NCDs disproportionately affect people in low- and middle-income countries where more than three quarters of global NCD-related deaths occur.

Nucleases

A group of enzymes whose primary function is to partially or fully degrade nucleic acids.

Organoids

Organoids are complex collections of cells grown in a 3D culture medium that recreate many of the physiological and genomic characteristics of various tissues or organs.

Other water

Water with more than 1,000 mg of dissolved solids per liter.

Patent pool

A consortium of at least two competing companies that allows partners to share the use of patents relating to a particular technology.

Patient access programs

This refers to commercial programs that are typically self-sustaining and provide medicines for underserved populations, for example by offering a reduced treatment fee.

Patient support programs

Any organized system providing services and direct patient or patient-caregiver interactions that are intended and designed to educate patients about certain diseases, and help patients with access to and/or the management of prescribed medicines and/or disease outcomes and/or offer doctors support for their patients.

Pharmacovigilance

The science and activities related to the detection, evaluation, understanding, and prevention of adverse reactions or other drug-related problems.

Phase I clinical trial

Phase I clinical trials test a new therapeutic candidate in a small group of subjects (for example, 20-80) for the first time (‘first in man study’) to evaluate safety (for instance, to determine a safe dosage range and to identify side effects).

Phase II clinical trial

Phase II clinical trials study the medical or behavioral

intervention in a larger group of subjects (several hundred) to determine efficacy (biological activity) and to further evaluate its safety.

Phase III clinical trial

Phase III clinical trials investigate the efficacy of the medical or behavioral intervention in large groups of subjects (from several hundred to several thousand) by comparing the intervention to other standard or experimental interventions as well as to monitor adverse effects and collect information that will allow the intervention to be used safely.

Potential loss or harm

A possible adverse impact to organizational operations (i.e., financial loss, function limitation or loss), asset (i.e., damage, mis-operation), or individuals (i.e., personnel injury, loss of life).

Prediabetes

A condition regarded as indicative that a person is at risk of progressing to Type 2 diabetes.

Primary or secondary caregivers

Primary caregiver is the birth mother of a newborn, the biological father in case of homo-parental family or the initial primary caregiver of a newly adopted child. Only one person can be the child's primary caregiver. Secondary caregiver means a person who has parental responsibility for the child but is not the primary caregiver.

Process-related emissions

Greenhouse gases released into the atmosphere during manufacturing operations.

Product serialization

During serialization, every product within a production line receives a clear, usually random and encrypted number, which is stored in a database. The manufacturer of each individual product can later be traced securely.

Pulse survey

A pulse survey is a short employee survey that focuses on a specific topic to gauge the current sentiment of the workforce. This can, for example, relate to a single business unit in the case of change processes or be targeted to the entire workforce.

Risk-sharing agreement

An agreement between the producer or manufacturer and the payer or provider that allows access to a health technology through coverage or reimbursement under certain conditions.

Role

Our company uses a market-oriented system to rate positions within the company. To facilitate consistency across the organization, each position is assigned a specific role, with an overarching job architecture classifying each role as one of 11 levels, 15 functions and an array of career types (Core Operations, Services & Support Groups; Experts; Managers; Project Managers).

SHAPE program

SHAPE stands for Systematic Health Access and Patient Enablement Program. It is a global program we offer to improve access of medicines in our healthcare portfolio for underserved patients in low- and middle-income countries.

SQ

The abbreviation for our Corporate Sustainability, Quality and Trade Compliance function.

STEM

This abbreviation stands for Science, Technology, Engineering, and Mathematics.

Schistosomiasis

Schistosomiasis is a chronic condition and one of the most common and most devastating parasitic diseases in tropical countries. Flatworms transmit the disease. It is widespread in regions where large sections of the population have no access to clean water or sanitary installations. People are infected by the parasite when exposed to infested water during routine agricultural, domestic, occupational, and recreational activities. The minuscule larvae penetrate human skin, enter the blood vessels and attack internal organs. The infection rate is particularly high among children. Untreated schistosomiasis can cause potentially fatal chronic inflammation of vital organs as well as anemia, stunted growth and impaired learning ability, all of which have devastating consequences for the lives of children.

Scope 1

This includes emissions that occur in our company, for instance by generating energy from fossil fuels or by releasing process-related emissions.

Scope 2

This includes emissions from purchased energy such as electricity, heat, steam, or cold.

Scope 3

Scope 3 includes indirect greenhouse gas emissions, such as the extraction and production of purchased materials, transport-related activities, waste disposal, and employee travel.

Scorecard

An evaluation tool for measuring, documenting and controlling activities using metrics.

Security

This relates to all necessary measures and governance activities to detect, analyze, handle, and mitigate security- and crime-based threats to the company. It is integral to protecting both our employees and the tangible and intangible assets of the company.

Signal management

A set of activities performed to determine whether, based on an examination of individual case safety reports, aggregated data from active surveillance systems or studies, scientific literature information, and other data sources, new risks are associated with an active ingredient or a medicinal product or whether known risks have changed. These activities also provide any related recommendations, decisions, communications, and tracking.

Small-molecule drugs

Substances with a low molecular weight ("small"-molecule) substances consist of only a few hundred atoms. Compared to larger biological treatments, the particularly small size of these drugs makes it more likely that they will reach their target in the body. Today, the vast majority of pharmaceuticals are of the small-molecule kind.

Spontaneous reports on adverse effects

An unsolicited communication by a healthcare professional or consumer to a company, regulatory authority or other organization (e.g. the World Health Organization, a regional center or poison control center) that describes one or more adverse reactions in a patient who was given one or more medicinal products and that does not derive from a study or any organized data collection scheme.

Stem cell lines

Groups of stem cells derived from animal or human tissue. They can be cultivated in vitro and multiply indefinitely.

Stem cells

Undifferentiated cells with the potential to develop into many different cell types that carry out different functions.

Sustainable Development Goals (SDGs)

As part of the 2030 Agenda, the United Nations (UN) presented 17 Sustainable Development Goals (SDGs). By achieving the SDGs by 2030, sustainable development should be ensured worldwide on an economic, social and environmental level. States, municipalities and companies can contribute to this through various measures.

TRIPS

The Agreement on Trade-Related Aspects of Intellectual Property Rights is an international legal agreement between all the member nations of the World Trade Organization. TRIPS seeks to ensure that the measures and procedures for enforcing intellectual property rights do not become a barrier to lawful trade.

Tetramethylammonium hydroxide (TMAH)

A quaternary ammonium salt with the molecular formula $N(CH_3)_4+ OH-$. It is a strong base and is commonly encountered as concentrated solutions in water or methanol. TMAH has numerous and diverse industrial and research applications, such as the anisotropic etching of silicon.

Thin films

A very thin layer (one atom or one molecule thick) of a substance deposited on a supporting material such as a semiconductor. Customers use our products to create such thin films.

Trace substances

Substances dissolved in water that are present only in minute amounts. Also referred to as micropollutants, these are synthetic substances present in concentrations ranging from one nanogram to one microgram per liter of water.

Transfer of value

Direct and indirect transfers of value, whether in cash, in kind or otherwise (for instance promotional purposes).

Vivarium

The vivarium, also known as animal research facility, is a specially designed building type, which accommodates controlled environments for the care, use and maintenance of experimental animals.

WASH

This stands for “water, sanitation and hygiene”. The acronym is used to refer to a set of activities addressing inadequate access to clean water and sanitation facilities, as well as poor hygiene behavior.

Imprint

Published on April 11, 2024 by
Merck, Group Corporate Sustainability
Frankfurter Strasse 250, 64293 Darmstadt, Germany

Tel.: +49 (0) 6151-72 0
Email: **service@merckgroup.com**

www.merckgroup.com

Contact for questions regarding this report:
Maria Schaad, Group Corporate Sustainability

Concept and implementation of HTML & PDF:
nexxar GmbH, Vienna – Online annual reports and online sustainability reports

Text and consulting:
Stakeholder Reporting GmbH & Co. KG
www.stakeholder-reporting.com

Photos and graphics:
Merck, Andreas Reeg

Merck, Group Corporate Sustainability
Frankfurter Strasse 250,
64293 Darmstadt, Germany
Telephone: + 49 6151 72-0
Email: service@merckgroup.com
www.merckgroup.com