



TRANSFORMING AVIATION



Sustainability Report
MTU AERO ENGINES AG
BUSINESS YEAR 2022

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FOREWORD BY THE CHIEF EXECUTIVE OFFICER



LARS WAGNER
*CHIEF EXECUTIVE OFFICER AND CHIEF
SUSTAINABILITY OFFICER MTU AERO
ENGINES AG*

Transforming Aviation

Dear readers,

We are transforming aviation—with innovative concepts, great enthusiasm and a vision: emissions-free flight. Against this backdrop, I'm delighted to have been given the opportunity to lead MTU into a successful future as CEO and Chief Sustainability Officer. Together, the entire Executive Board team and our employees have a significant part to play in making aviation sustainable.

A strong commitment needs a strong foundation. Our conviction is reflected in our commitment to the UN Global Compact and its globally recognized principles for greater sustainability. In addition, the Paris Agreement's 1.5 degree target is the benchmark against which we align our own ambitious targets for climate action.

Emissions-free flight is our vision

We want to ensure worldwide mobility, and so we are aiming for emissions-free flight. For this major aviation goal, we are investing in the development of new and alternative propulsion technologies. Our Clean Air Engine (Claire) agenda charts a definite course to emissions-free flight—and through Claire, we delineate possible solutions and highlight the potential for sustainable propulsion systems. MTU has set its sights on an evolutionary enhancement of the gas turbine engine based on the geared turbofan as well as on revolutionary propulsion concepts such as the water-enhanced turbofan (WET) and the Flying Fuel Cell.

Flight testing of the GTF Advantage, an improved version of the geared turbofan from our partner Pratt & Whitney, began in the reporting year. This engine heralds further savings in fuel consumption and emissions. And at the same time it will be fully SAF compatible, which means that it can be flown 100 percent on sustainable aviation fuels (SAFs). The GTF Advantage is expected to be available starting in 2024.

SAFs are essential for decarbonizing aviation, but they also have advantages on the ground: since last financial year, MTU Maintenance has been the world's first maintenance provider to enable its customers to carry out test runs with SAF. This significantly reduces carbon emissions. Some of our customers are already taking advantage of the offer of a low-emission acceptance run at the end of a shop visit.

We also made further progress with novel propulsion concepts in 2022. A milestone for our WET concept was the launch of SWITCH. This is a project that forms part of the European Commission's Clean Aviation research program. MTU will coordinate a consortium of renowned industry partners within SWITCH. Together with them, we want to combine our innovative WET concept with hybrid-electric propulsion system components on the basis of a geared turbofan. We want to show that this is a viable option for reducing both fuel consumption and carbon emissions by 25 percent. In addition, because it uses wet combustion, the concept promises a significant reduction in other climate-relevant emissions such as nitrogen oxides as well as in contrail formation.

We are working on MTU Green Global

We are also continuing our transformation at our sites. We are making our production and maintenance more sustainable through the company's climate action strategy, the ecoRoadmap. Launched in 2021 for our main site in Munich, we have extended the ecoRoadmap to other production sites in our network. MTU Green Europe was the name we gave the 2022 stage of the expansion—with all production sites in Europe actively working toward the common goal of achieving a 60 percent reduction in CO₂ emissions by 2030. This year, our new repair site in Serbia and MTU Maintenance Canada will follow suit in the MTU Green Global expansion stage. The core elements remain sustainable energy-saving measures, the increased use of green energy and the expansion of our own emissions-free power generation. To this end, we plan to switch from gas to geothermal energy at the Munich site, and we carried out exploratory drilling in 2022. If successful, we could be meeting around 80 percent of our heating needs without fossil fuels as early as the end of 2024.

Teamwork sets MTU apart

The only way we can achieve such ambitious goals is by working together. That's why we place a strong emphasis on leadership and excellent teams. After all, it is MTU's managers and employees whose skills, commitment and performance make the company so successful today and ensure its future viability. This calls for a willingness to embrace change, for agility, for a digital mindset and for diversity. I'm particularly pleased that our Executive Board has been more diverse since February 2023, and I welcome Dr. Silke Maurer, an experienced colleague, on board as Chief Operations Officer.

New technologies and approaches demand new skills. That's why we invest in forward-looking training for our workforce on the basis of our global leadership values: "We create trust," "We empower," "We transform." Trusting collaboration and a willingness to embrace change are our drivers for an innovative corporate culture. In a working environment that inspires and connects, teams become more successful and make better use of potential.

Human rights are our responsibility

An inclusive working environment promotes not only MTU's innovative strength and competitiveness but also equal opportunities for all colleagues. The central concern of our corporate social responsibility is respect for human rights. We fulfill our duty of care as an employer of more than 11,000 employees worldwide and as a customer in global supply chains. After all, sustainable management is not limited to how we develop, manufacture and maintain our products. We have visibly strengthened the principles of responsible corporate governance with a Policy Statement on the Protection of Human Rights and by enhancing our risk process for our human rights due diligence.

We have given this sustainability report the title "Transforming aviation." For us, that's more than just a motto—it's part of our DNA. It derives from our vision "We shape the future of aviation" and underlines the standards we set ourselves: we are actively shaping change, changing ourselves and changing aviation to lay the groundwork for the mobility of the future—which is mobility with a future. Read this report to find out more about what we're doing!

I hope you enjoy it!



Lars Wagner

Chief Executive Officer and Chief Sustainability Officer, MTU Aero Engines AG

Services & tools

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GRI: 102-14

UNGC: 1-10

SUCCESSFUL 2022 BUSINESS YEAR

MTU Aero Engines

MTU Aero Engines AG is Germany's leading engine manufacturer. The Group offers solutions for the entire aircraft engine lifecycle—from development to production to maintenance. Its products and services are often characterized by innovative approaches.



Key company figures for 2022



€ 5.3 bn
An increase of 27%



11,273
employees
worldwide



17 locations
in important markets
and regions

MTU Aero Engines is Germany's leading engine manufacturer and an established global player in the industry. We design, develop, manufacture, market and support commercial and military aircraft engines in all thrust and power categories and stationary gas turbines. Operating affiliates all over the world, MTU has a local presence in major regions and markets and is headquartered in Munich, Germany.

In the commercial engine business, we have content in all thrust and power categories, from propulsion systems for business jets and engines for narrowbody aircraft with geared turbofan technology to the world's most powerful engines. The company is a valued and trusted partner to all the big players in the industry: GE Aerospace, Pratt & Whitney and Rolls-Royce.

In the commercial maintenance sector, MTU Maintenance is one of the world's top three service providers for commercial aircraft engines and industrial gas turbines. We are responsible for, among other things, the maintenance of Pratt & Whitney eco-efficient geared turbofan engines and for providing maintenance solutions to a global network of original equipment manufacturers (OEM). Our strength is based on more than 40 years of experience, a global MRO network and a product range that encompasses engines for all common aircraft types, from business jets to widebody aircraft. The tailored services provided by our MRO experts cover the entire engine lifecycle.

MTU brings its skills and expertise to the fore as the leading industrial company for practically all aircraft engines operated by the German Armed Forces. In addition, the company plays a key role in Europe's most important military engine programs—from development to production to maintenance.

MTU's OEM segment covers new commercial engines, including spare parts, and the whole of the military sector. The MRO (maintenance, repair and overhaul) segment comprises all commercial maintenance activities.

WWW.MTU.DE

MTU Aero Engines worldwide

- 14 MTU Maintenance Canada
- 15 MTU Maintenance Dallas
- 16 MTU Aero Engines North America
- 17 MTU Maintenance do Brazil

- 01 MTU Aero Engines, Headquarters
- 02 MTU Maintenance Hannover
- 03 MTU Maintenance Berlin-Brandenburg
- 04 MTU Aero Engines Polska
- 05 EME Aero

- 06 MTU Maintenance Serbia
- 07 Aerospace Embedded Solutions
- 08 MTU Maintenance Lease Services
- 09 Ceramic Coating Center

- 10 P&WC Customer Service Centre Europe GmbH
- 11 MTU Maintenance Zhuhai
- 12 Airfoil Services
- 13 MTU Maintenance Service Centre Australia



Locations fully consolidated:

OEM business:
 MTU Aero Engines Munich
 MTU Aero Engines Polska
 MTU Aero Engines North America

MRO business:
 MTU Maintenance Hannover
 MTU Maintenance Berlin-Brandenburg
 MTU Maintenance Lease Services
 MTU Maintenance Serbia
 MTU Maintenance Canada

Revenue* 2022
 OEM business: € 1,831 million
 MRO business: € 3,616 million

Employees 2022
 OEM business: 6,973
 MRO business: 4,300

Major locations and participations ●
 IGT Service Centers ●
 Representative offices ●

GRI 102-7: This report covers all of MTU's fully consolidated sites. The company has a presence in global markets through other subsidiaries and maintains joint ventures with partners in Asia, for example MTU Maintenance Zhuhai with China Southern Air as a joint maintenance shop, and Airfoil Services in Malaysia, a joint venture with Lufthansa Technik for airfoil repair. (*Revenue by business segment before consolidation)

Successful 2022 business year

Despite the difficulties presented by oil price and inflation rate increases, which arose due to the effects of the war in Ukraine and problems in international supply chains, MTU can look back at a successful financial year in 2022. At EUR 5.3 billion, revenue was up 27% from EUR 4.2 billion in the previous year. Operating profit (EBIT adjusted) increased by 40% to EUR 655 million (2021: EUR 468 million). Earnings after tax (adjusted) developed in line with operating profit and increased by 30% to EUR 476 million in 2022 (2021: EUR 342 million). These figures underscore MTU's profitable growth course. At EUR 22.3 billion, the order backlog at the end of 2022 was level with the previous year's figure (2021: EUR 22.2 billion). Most of the orders were for the geared turbofan engines of the PW1000G family, in particular the PW1100G-JM, and the V2500. The recurrence of this high figure illustrates the continued demand for our products and by extension highlights MTU's future viability.

Key financial data (in EUR m)

> GRI 201-1

	2022	2021	2020
Revenue	5,330	4,188	3,977
Earnings before interest and tax (EBIT, adjusted)	655	468	416
Earnings before interest and tax (EBIT, reported)	508	355	262
Tax expense	130	84	48
Net income (reported)	333	231	147
Net income (adjusted)	476	342	294
Capital expenditure on property, plant and equipment and intangible assets	447	384	327

We take a long-term approach to our company's success and our goal is to steadily increase shareholder value. We intend to continue our profitable growth course beyond 2023. For the medium-term outlook, the target formula is 8 - 1 - 25; in other words, EUR 8 billion in revenue and EUR 1 billion in operating profit in 2025.

We add value to society

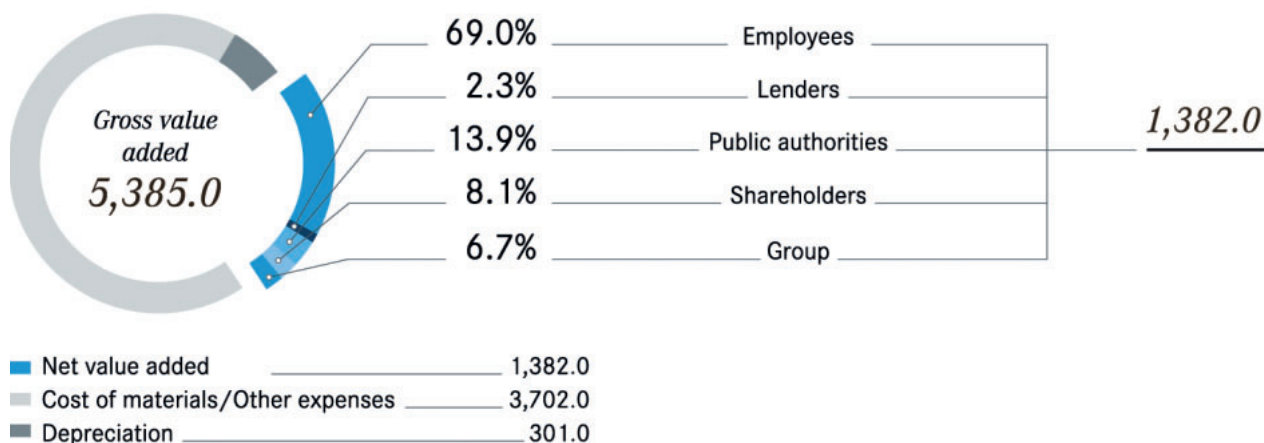
Our commercial success generates added value for our stakeholders and contributes to society’s prosperity and the economic development of the communities where our business activities are located. We offer interesting and future-proof jobs in a high-tech industry and professional training as part of Germany’s dual-track system. At the end of 2022, the MTU Group employed 11,273 people at fully consolidated sites around the world (2021: 10,508) with 330 young apprentices (2021: 349). We are a major employer in the region at all our major international sites and are exporting the successful German training model: in Serbia, our new repair site, we provide specialist aviation training based on the dual-track system. We pay our employees attractive salaries and offer a broad range of perks. In 2023, we intend to further expand our personnel capacity so that we can drive forward our programs for the future and thus promote MTU’s future viability. As in 2022, we will need new employees primarily in engineering and for digitalization.

As a local investor and patron, we promote education and the academic landscape, for example by maintaining close ties to universities and colleges, especially in the regions where our sites are located. We invest in our sites; in 2022, financial resources went primarily toward building and expanding production capacity in Munich, Hannover and Serbia. We create jobs in upstream supply chains and work with around 6,200 suppliers, mainly in Europe, and have defined mandatory sustainability standards for our cooperation with them and enshrined these in a Code of Conduct.

Responsible tax policy

We act as a responsible global corporate taxpayer and comply with applicable tax laws and regulations, enabling us to make a significant contribution to society at our sites in Germany and elsewhere. A binding Code of Conduct supports systematic compliance with legal and regulatory requirements throughout the Group. We promote ethical and transparent business practices and, in particular, do not use tax avoidance measures, such as the establishment of companies solely for this purpose. We have adopted a Group tax policy that establishes our principles, tax strategy and tax risk management in the company and defines our responsibilities. We report regularly in accordance with applicable regulations and requirements (e.g. IFRS, CbCR), thereby transparently disclosing our tax position.

Value added 2022 (in EUR m)



GRI 201-1: Gross value added = revenue and other income, dividend payment to shareholders in the 2022 financial year for 2021

The value-added statement shows that MTU's corporate performance amounts to a gross value added of EUR 5.385 billion. After deducting the cost of materials, depreciation, amortization and other expenses, net value added came to EUR 1.382 billion. A large portion of that (69%) went to our employees in the form of wages, salaries and other benefits, while the Group retained 6.7% for future investments. The proportion allocated to pay taxes levied by public authorities accounted for 13.9%. MTU shareholders are to benefit from the company's good performance by receiving a dividend of EUR 3.20 per share. Our employees have the opportunity to share in MTU's success through the company's annual employee share program.

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GRI: [102-1](#), [102-2](#), [102-3](#), [102-5](#), [102-7](#), [103-2](#), [103-3](#), [201-1](#), [207-1](#), [207-2](#)

WE TAKE RESPONSIBILITY

Sustainability strategy and organization

As an engine manufacturer and key player in the sector, we want to actively shape the transformation of aviation. Our efforts are focused on climate action and our vision of emissions-free flight. In addition, as a manufacturing company and employer of some 11,000 people, we aim to act responsibly in all areas.

Shouldering responsibility is embedded in our corporate identity. Sustainability means that this sense of responsibility permeates every area of our business and extends to the entire value chain. We embrace the principle of bringing sustainability, economics, ecology and social responsibility into harmony. Our commitment is based on the observance of statutory regulations and internal standards—essentially, on those enshrined in the [MTU Code of Conduct](#) and on the protection of human rights of our [Policy Statement](#)—as well as on the ten principles of the UN Global Compact. Our guiding principle “We shape the future of aviation” reflects our sustainable approach.

UN Global Compact and Sustainable Development Goals



The UN Global Compact is a unique sustainability initiative that we joined in 2011. As a signatory, we are committed to upholding the [ten principles](#) for respecting human rights, ensuring fair working conditions, protecting the environment and preventing corruption. We consider them important guidelines for responsible corporate governance, and we also pass them on to the supply chain by means of a [Code of Conduct](#).

As a signatory to the UN Global Compact, we also want to contribute to the UN’s 2030 Agenda. At the core of the agenda are 17 goals for sustainable development, or SDGs for short, which address the three dimensions—economy, environment and society. We support the implementation of the SDGs and have identified eight for MTU to focus on.



→ [Learn more about our contribution to the SDGs](#)

Standards and guidelines that we follow

- UN Universal Declaration of Human Rights
- Principles of the UN Global Compact
- The UN's 2030 Agenda and Sustainable Development Goals (SDGs)
- Core labor standards of the International Labour Organization (ILO)
- German Corporate Governance Code

Our fields of action and goals



Our claim: As a technology leader, we are shaping the future of sustainable aviation through innovative propulsion solutions. Emissions-free flight is our vision. In doing so, we stand for responsible and environmentally friendly production, maintenance and procurement and offer a safe and attractive working environment.

Corporate governance

- Comprehensive sustainability management
- Ensure the security of information and systems
- Protect personal data in all areas of the company
- Compliance as part of the corporate culture
- Active commitment to combating corruption in all business areas
- Ensure compliance with embargo and export guidelines
- Regular and open dialogue with all stakeholder groups

Products

- Make product quality and flight safety top priority
- Compile the MTU Group's Scope 3 activities
- Reduce the climate impact of products during operation
- Reduce the energy consumption of products during operation
- Minimize the health effects of product use (exhaust and noise emissions)

Production & maintenance

- Reduce CO₂ emissions at all production sites (Scope 1-3)
- Continuously improve resource efficiency
- Efficient management processes have been established
- Advanced procedures in site and plant operations
- Raise employee awareness of environmental protection in production

Procurement

- Human and employee rights are central components of our business relationships
- In our cooperation with suppliers, we pay attention to a resource- and environment-friendly value chain
- CSR is embedded in our contracts and sourcing decisions. In this way, we safeguard social and ecological standards
- Responsible handling of conflict minerals is ensured
- A Scope 3 upstream carbon footprint is compiled

Employees

- Ensure compliance with human rights at our own sites
- Provide active and targeted employee development at all hierarchical levels
- Continuously promote diversity and equality of opportunity in the workforce
- Enable a work-life balance for all employees
- Ensure a high level of health and safety in the workplace
- Promoting mutual employer/employee dialogue
- Continuously increase external and internal employer attractiveness
- Trust-based leadership
- Ensure a high level of employee satisfaction

Society

- Research collaborations for joint knowledge building
- Corporate citizenship: MTU is part of society and a good neighbor
- Employees use the knowledge they have acquired at MTU to play a responsible role in society

OUR GOALS IN THE FIELDS OF ACTION: MTU SUSTAINABILITY PROGRAM 2025+

Climate action is a key concern

MTU is committed to the goal of limiting global warming preferably to 1.5 degrees Celsius, as set out in the Paris Agreement. We are pursuing our long-term goal of zero-emission aviation through our Clean Air Engine (Claire) technology agenda. Through Claire, we are developing innovative propulsion concepts that meet the high safety standards of aviation, greatly reduce impact on the climate and fulfill all future noise emissions limits. We firmly believe that taking a sustainable approach to our business will allow us to remain competitive and successful in the long term. [More on aligning our product stewardship with the Paris Agreement in the chapter Climate impact of aircraft engines](#)

Our value creation should be sustainable as well. We are implementing concepts to reduce the carbon footprint of our own operations in production and maintenance at our sites, and attaining carbon neutrality in the long-term. [For more information, see climate action at production sites](#)

Stronger commitment to human rights

The protection of human rights has always been an important concern for MTU. Against the backdrop of increasing regulatory requirements such as Germany's Act on Corporate Due Diligence Obligations in Supply Chains (LkSG) and given stakeholder expectations of responsible management of global supply chains, MTU has established a stricter risk management system for potential human rights violations in the supply chain and in its own business operations. As a high-tech company, we are generally exposed to a lower risk of human rights violations than other industries.

ESG targets are relevant to compensation

Sustainability topics are an integral part of MTU's strategy and selected control variables from CR management are relevant to compensation. This will strengthen sustainability in the Group and make progress more measurable. For the 2022 financial year, the environmental, social and governance (ESG) targets came from the areas of climate action in site operations and employee satisfaction, which are incorporated into the variable compensation of the Executive Board and senior executives.

For climate action, annual progress is taken from the company's climate strategy, the ecoRoadmap. The ESG-relevant performance indicator CO₂ as a component of variable compensation was related to the European production sites (Munich, Hannover, Berlin and Rzeszów) in 2022. [Detailed presentation of the ecoRoadmap and goal attainment in 2022](#) MTU plans to extend this indicator to all its production sites in the current financial year of 2023.

Regarding employees, the ESG goal—encapsulated under the corporate value of “We create trust”—is derived from the results of the regular PulseCheck surveys, and goal attainment is determined based on the index value from feedback on the subject areas of commitment and leadership. [More about PulseCheck and goal attainment in 2022](#) From 2023 onward, the ESG target in this area will be assigned to the leadership value “We empower” and determined from employees' qualifications and training. The average number of training days per employee is taken into account.

Sustainable investment

The European Commission has set itself the goal of climate neutrality by 2050 with the European Green Deal. Furthermore, through the EU taxonomy established as part of the action plan on financing sustainable growth, the European Commission calls on companies to classify their business activities according to sustainability criteria. The taxonomy provisions apply to six environmental targets in the areas of climate change, water and marine resources, circular economy, pollution, and biodiversity. In addition, companies must demonstrate minimum social standards in order to claim green revenue, capex and opex shares. So far, there are no assessment criteria specifically for the aviation sector regarding the classification of economic activities within the taxonomy. [MTU's approaches and EU taxonomy information can be found in the non-financial statement of the Annual Report \(p. 113ff.\)](#)

As demand for ESG-focused investment opportunities increases, frameworks and requirements on sustainability reporting are on the rise, too. For example, the EU is currently preparing the Corporate Sustainability Reporting Directive (CSRD), which is intended to provide an expanded framework for corporate non-financial statements. External reporting on ESG issues is thus becoming more and more demanding and complex. MTU is preparing for the implementation of the CSRD requirements and continuously reviews current developments for its own reporting.

MTU ratings & rankings

Moreover, investors are increasingly evaluating companies and their business models according to ESG criteria. MTU's performance in relation to non-financial indicators is regularly assessed by capital-market analysts and independent experts. Important indices and rankings in which the company is currently represented are:



ISS ESG: MTU Aero Engines is rated Prime Status (C+) in the overall rating.

www.oekom-research.com



CDP: In this global carbon accounting of the annual climate footprint, we received a score of B in 2022.

www.cdp.net



EcoVadis: MTU received a silver medal in this holistic corporate responsibility rating.

<https://ecovadis.com>

MSCI: MTU Aero Engines is rated A.

www.msci.com/esg-ratings

Sustainability management across the entire Group

Chief Sustainability Officer (CSO) on the Executive Board

We have integrated sustainability into organizational structures and established sustainability management throughout the MTU Group. Through the corporate responsibility (CR) management system, we monitor our sustainability strategy, performance and goals.

A CR Board is responsible for the implementation of CR management on behalf of the Executive Board. At the Executive Board level, CEO Lars Wagner is also Chief Sustainability Officer (CSO), making him MTU's first representative for sustainability. He is primarily responsible for defining the positioning of MTU and its sustainability strategy and objectives. In this way, sustainability is integrated into our corporate decision-making processes. Moreover, the CSO monitors goal attainment and ensures that the CR organization is suitably aligned with the requirements and successfully implemented in the company. In carrying out these responsibilities, the CSO works closely together with the CR Board.

Corporate Responsibility Board as a central body

The CR Board acts in cooperation with the CSO as the highest decision-making body and draws its members from the tier-1 senior management team in corporate functions. It is responsible for driving sustainability forward at MTU, controlling CR activities and adopting CR actions and initiatives. The CR Board reports directly to the CSO as well as reporting regularly to the Executive Board and the Supervisory Board.

The CR Board meets regularly and as required. If necessary, representatives from further operational functions are invited to the meetings. A central CR coordination team manages Group-wide sustainability activities, overall CR management, communication with stakeholders about CR topics, and reporting on CR issues. It also works with an interdisciplinary CR team to continuously develop the CR management.

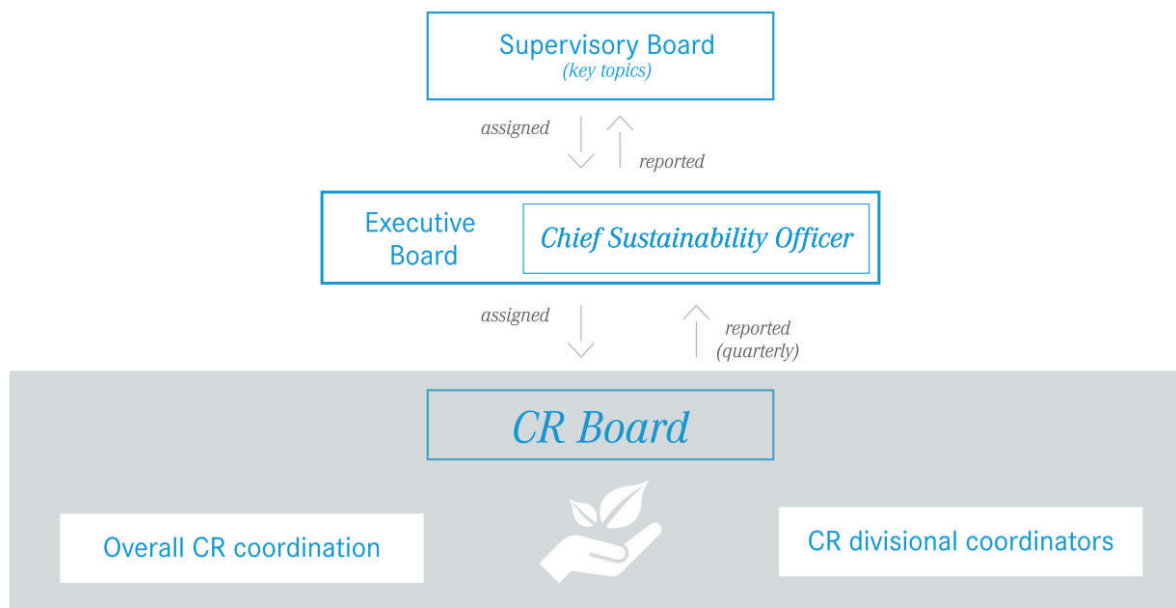
CR Board mission statement

We take responsibility for social and environmental issues in accordance with economic imperatives.

- We actively expand our Group-wide sustainability strategy.
- We promote interdisciplinary cooperation on CR projects within the company and in CR networks beyond the company gates.
- To this end, we work with the Executive Board and further decision-makers to devise measurable objectives for realizing the MTU sustainability strategy.

At the heart of the interdisciplinary CR team are the CR divisional coordinators. They play an important part in operational implementation, working with experts in their disciplines to develop goals and measures, implement them, and take responsibility for monitoring their progress. In collaboration with the representatives in the business areas, the divisional coordinators are heavily involved in shaping the strategic focus of their respective CR goals and developing these goals over time. CR management officers at the sites support the CR divisional coordinators and the overall CR coordination team. The CR team also jointly conducts the annual materiality analysis for the sustainability topics. By implementing this organizational structure, we ensure that sustainability is embedded throughout the entire company for all relevant topics.

CR management at MTU



We steer our sustainability strategy through the CR management system, while the CR Board acts as the decision-making body in conjunction with the Chief Sustainability Officer. A central CR coordination team manages Group-wide sustainability activities and overall CR management, and CR divisional coordinators are responsible for goals and actions in their disciplines.

Risk management for non-financial issues

We integrate sustainability risks into our internal control system, and map and evaluate them using defined processes. MTU has established a Group-wide integrated risk management and control system, based on the leading international COSO II ERM Framework standard, with which it manages risks and opportunities for its business. The system also takes into account non-financial risks. For the topic of compliance, MTU has established a separate risk assessment and a separate reporting line, which the Compliance Officer coordinates.

Potential risks for the environment, society and employees that arise from MTU's business activities are identified and assessed on a quarterly basis by those responsible in the technical areas and by the CR Board. This is done in line with the existing opportunity and risk process, taking into account the respective probability of occurrence and the impact of the risk. The risk inventory is also reviewed for new material issues or aspects. Should substantial sustainability risks be identified for third parties, the Board passes the report on to the risk management team and, if appropriate, to the Executive Board.

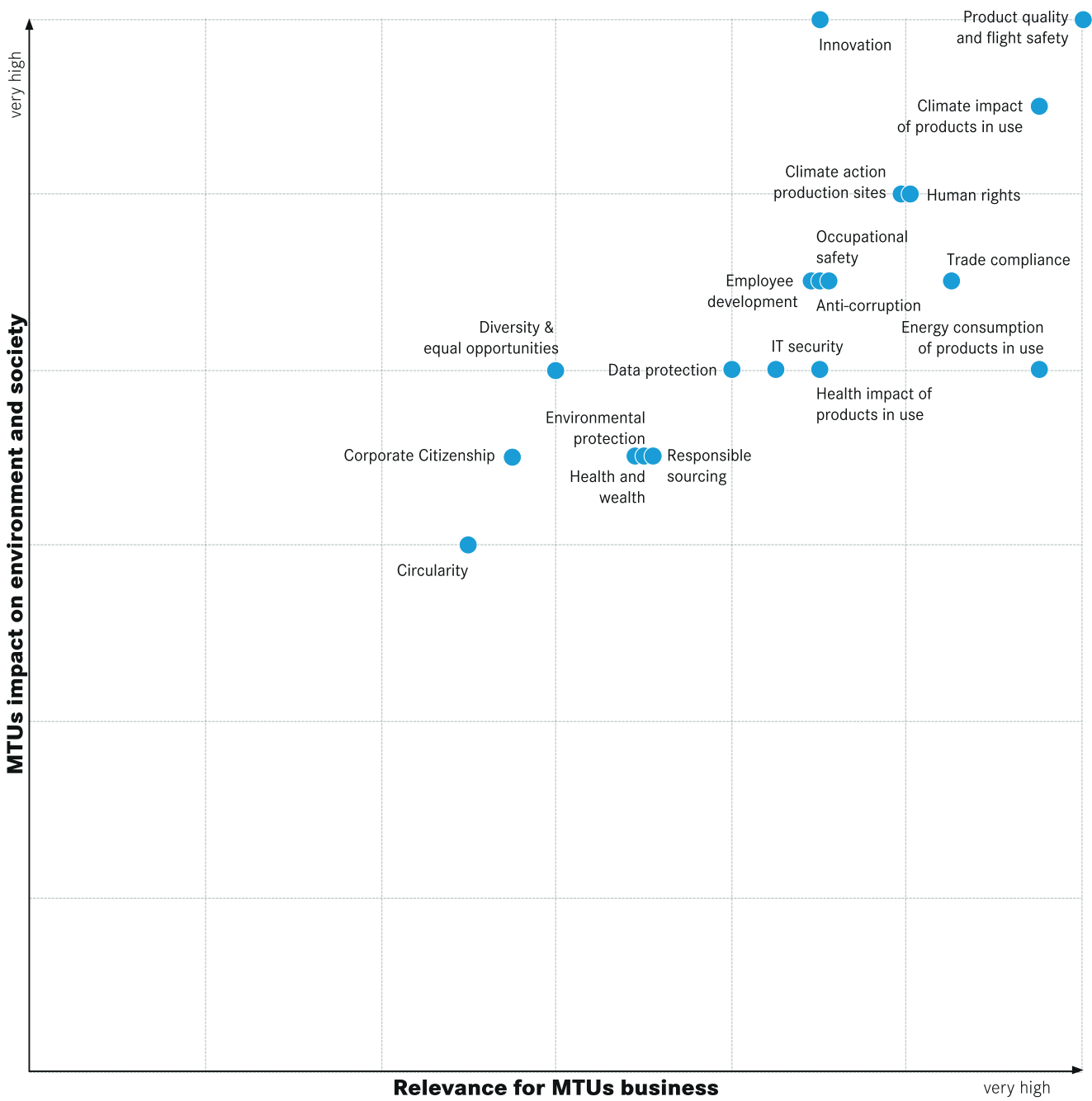
The risk assessment for the 2022 financial year identified no material risks in relation to the topics of our CR strategy. Material risks are those that are highly likely and have a severe negative impact.

OVERVIEW OF RISKS AND OPPORTUNITIES FOR MTU IN THE ANNUAL REPORT 2022

Materiality analysis: Topics relevant for MTU

We review our sustainability strategy annually to reflect recent changes and developments, refining our priorities in the process. As part of this annual materiality analysis, we assess the issues relating to the social and environmental impact of our business activities and look at positive and negative aspects alike (opportunities and risks). In addition, we evaluate the business relevance of the issues, based among other things on the impact they may have on the company's reputation or on the income statement. The analysis covers all our key business areas and fully consolidated sites as well as information gathered from our dialogue with internal and external stakeholders. → [More about stakeholder dialogue](#) We map the results in a materiality matrix.

Materiality matrix: Important sustainability topics and their weighting



GRI 102-46 Evaluation of topics for the 2022 financial year adopts the materiality concept in accordance with the legal implementation of CSR guidelines in Germany (CSR-RUG)

The determination of materiality for the 2022 financial year led primarily to a consolidation of multiple topics. Energy management was given a higher rating and merged with CO₂ emissions to form the topic “Climate action at the production sites,” as CO₂ emissions in site operations (Scope 1 and 2) result mostly from energy consumption. All other environmental aspects in site operations (water, waste, noise) have been combined as “Environmental management.” For the supply chain, too, the previously separate topics of responsible sourcing OEM and responsible sourcing MRO have now been consolidated across the two business units. Regarding employees, work-life balance and health management have been merged to form “Attractive working conditions.” We have adjusted the evaluations accordingly. The topic of the circular economy has been assessed for the first time in terms of its importance for MTU and its impact on third parties, and has been newly anchored in the matrix.

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GRI: 103-2, 103-3

UNGC: 1-10

MTU'S SUSTAINABILITY PROGRAM

Our goals 2025+

Corporate governance

Goals 2025**Comprehensive sustainability management**

MTU's forward-looking corporate responsibility strategy is implemented in the MTU strategy, and the fields of action are synchronized across all departments, with the goals integrated into MTU's processes.

A Group-wide climate strategy has been adopted.

Change mindset sustainability in the Group is being strengthened.

MTU is perceived as a company that operates sustainably and carries out impressive sustainability activities.

Ensuring the security of information and systems

Consistent refinements to existing processes and regulations continue to ensure ongoing compliance with applicable legal requirements and the security of our data, information and systems in all areas of the company.

Protecting personal data in all areas of the company

These take into account regulatory changes as well as technical developments.

Compliance as part of the corporate culture

MTU's Code of Conduct, the rules and regulations derived from them, and the "Tone from the Top" continue to help anchor compliance as part of MTU's corporate culture.

Active commitment to combating corruption in all business areas

Raising employee awareness through MTU's training program, reviewing relevant business processes through regular audits, and a zero-tolerance policy will continue to complement this compliance approach at MTU in the future.

Ensuring adherence to embargo and export guidelines**Regular and open dialogue with all stakeholder groups**

More transparent reporting and improvement in ratings and stakeholder dialogue through a material increase in sustainability management.

MTU is taking up current formats for the sustainability dialogue with its employees and stakeholders.

Product			
Goals 2025			
Highest priority for product quality and flight safety	Our vision is “Zero Defects.” In this, we stand for future-oriented quality management: Implementation of innovative and at the same time recognized standards Commitment to refining state-of-the-art standards High degree of employee training and support with current enablers such as digitalization Recognized and standardized methods for systematic defect prevention, analysis and sustainable remediation		
Compile the MTU Group’s key Scope 3 activities	Goals 2030		
	Compile, analyze and evaluate the MTU Group’s key Scope 3 activities		
Reduce the climate impact of products	Goals 2025	Goals 2035	Goals 2050
	up to -60%* climate impact with current generation of turbofans	up to -65%* climate impact with the next generation of turbofan up to -80%* climate impact with the WET concept up to -95%* climate impact with the flying Fuel Cell	up to -70%* climate impact with the subsequent generation of turbofans up to -85%* climate impact with the WET concept up to -95%* climate impact with the flying Fuel Cell
Reduce the energy consumption of products during operation	Goals 2025	Goals 2035	Goals 2050
	up to -17%* energy consumption with current generation of turbofans	up to -25%* energy consumption with the next generation of turbofans up to -35%* energy consumption with the WET concept up to -5%* energy consumption with the flying fuel cell	up to -30%* energy consumption with the subsequent generation of turbofans up to -40%* energy consumption with the WET concept up to -10%* energy consumption with the flying fuel cell
Minimize the health effects of product use (exhaust and noise emissions)	Goals 2025	Goals 2035	Goals 2050

up to -10 EPNdB noise (cumulative) with the current generation of turbofans compared to predecessor products
reduction in particulate emissions through the use of sustainable aviation fuels

further reduction in noise through the next generation of turbofans and the flying fuel cell
up to -80%* NOx emissions through the WET concept
avoid CO, UHC and particulate emissions by using hydrogen in the flying fuel cell and potentially in turbofans
significantly reduce particulate emissions through the use of sustainable aviation fuel and the WET concept

further reduction in noise through the subsequent generation of turbofans and the flying fuel cell
avoid CO, UHC and particulate emissions by using hydrogen in the flying fuel cell and potentially in turbofans and in the WET concept in additional application

*compared to an engine from the year 2000

Procurement practices

Goals 2025

Human and employee rights are central components of our business relationships.

In our cooperation with suppliers, we pay attention to a resource- and environment-friendly value chain

The new CR requirements for the supply chain resulting from Germany's Due Diligence Act are consistently implemented

The Code of Conduct reflects the contents of the Due Diligence Act, is a binding part of the contract, and compliance with it is regularly reviewed.

Risk management is implemented in our processes.

Supporting IT systems are implemented.

CR is embedded in our contracts and sourcing decisions.

In this way, we ensure social and ecological standards

CR assessments of suppliers are incorporated into sourcing decisions.

Our employees have been trained in CR and suppliers' awareness has been raised.

Responsible handling of conflict minerals is ensured.

Automated queries ensure compliance with and verification of contractual requirements.

A balance sheet of CO₂ emissions scope 3 upstream is prepared

Recording, analysis and evaluation of the main Scope 3 activities

 Manufacturing and maintenance

	Goals 2025	Goals 2030	Goals 2045
Reduce CO₂ emissions at the fully consolidated sites (Scope 1-3)	Reduction of CO ₂ emissions at all production sites (Scope 1&2) based on the Paris Agreement Compile, analyze and evaluate the MTU Group's main Scope 3 activities upstream and downstream	Reduce CO ₂ emissions (Scope 1&2) at all production sites, based on the Paris Agreement Evaluate and manage all Scope 3 activities at fully consolidated sites	The long term goal is carbon-neutral production (Scope 1&2) at all sites
Continuously improve resource efficiency	Continuous improvement of resource efficiency (e.g. energy, water, raw materials, and consumables and supplies), specifications by site managers		
Efficient management processes have been established.	Efficient management processes have been established at the sites to reduce adverse environmental impact		
Advanced procedures in site and plant operations.	Improvements in climate protection achieved through advanced procedures in site and plant operations.		
Raising employee awareness of climate protection in production	Regular external and internal communication as well as raising of employees' awareness		

 Employees

Goals 2025

Ensure compliance with human rights at our own sites

Human rights continue to be fully respected at all of our own sites

Provide active and targeted employee development at all hierarchical levels

Employees find a framework in which they can develop and contribute in a meaningful way.

Promote ongoing diversity & equality of opportunity for the workforce

Diversity and equality of opportunity are perceived as added value and promoted.

Enable a work-life balance for all employees

It is possible for all employees to achieve a work-life balance.

Ensure a high level of health and safety in the workplace

Accident figures are well below the industry average, awareness-raising measures are in place, and the TOP principle is applied.

Promote mutual employer/employee dialogue

The dialogue between employees and employers is open and constructive.

Continuously increase internal and external employer attractiveness

The working environment (rooms, tools, job security, ergonomics) and conditions (remuneration, social benefits, working time flexibility, participation, personal responsibility) are oriented to the needs of the employees and are attractive.

Trust-based leadership

Leadership is valued for its confident handling of new forms of collaboration and employee diversity.

Ensure a high level of employee satisfaction

Employees are highly committed due to their high level of satisfaction.

 Society

Goals 2025

Research collaborations for joint knowledge building

Our research collaborations play a significant part in the further development of technology for aviation and beyond.

MTU uses its collaborations to promote young scientists.

Through research collaborations and participation in European research programs, we are shaping propulsion technologies in line with the goals of the Paris Agreement on climate action.

Corporate citizenship: MTU is part of society and a good neighbor

MTU enters into targeted partnerships within the industry and at its locations in order to jointly achieve further sustainability goals.

MTU's established donations policy provides targeted support for sustainability projects with a local connection or thematic link to its business.

Employees use the knowledge they have acquired at MTU to play a responsible role in society

MTU raises its employees' awareness of sustainability issues beyond the boundaries of the plant.

Services & tools

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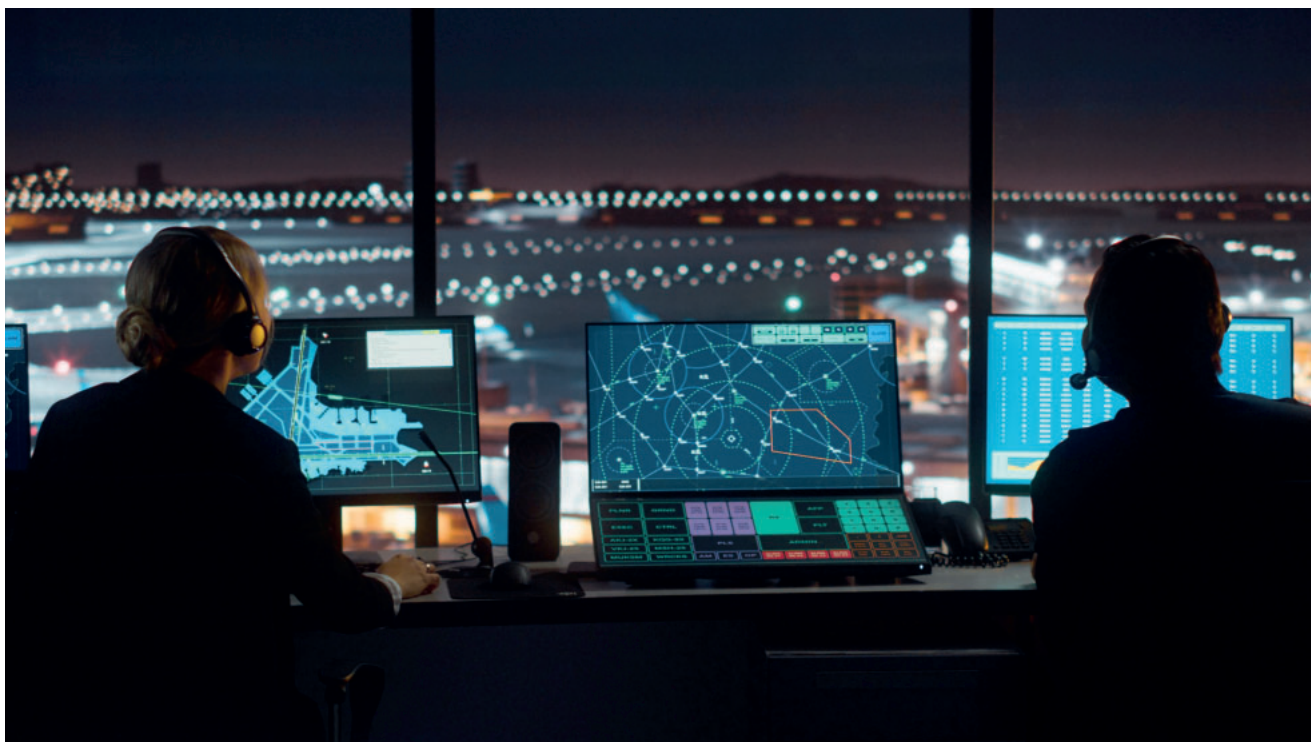
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UNGC: 1-10

GOVERNANCE WITH CLEAR RULES

Compliance

We act with integrity in our working and business relationships—in other words, in accordance with applicable law and our internal body of rules and regulations. A key benchmark for our behavior in the company, toward our business partners and in society is a Group-wide Code of Conduct that provides all of us with binding guidelines.



MTU's long-term commercial success is founded on responsible actions carried out in full compliance with all applicable laws. Our Code of Conduct and internal guidelines contain clear requirements and thus provide orientation.



Compliance is essential for us and for the collaboration with our stakeholders, and serves as the foundation for the long-term success of our company. MTU conducts its business as a fair employer, business partner and customer, and advocates transparent competition where all parties are on an equal footing. Integrity and responsible conduct are core values of our corporate culture and are embedded in the MTU Code of Conduct, which is binding for all employees, managers and members of the Executive Board.



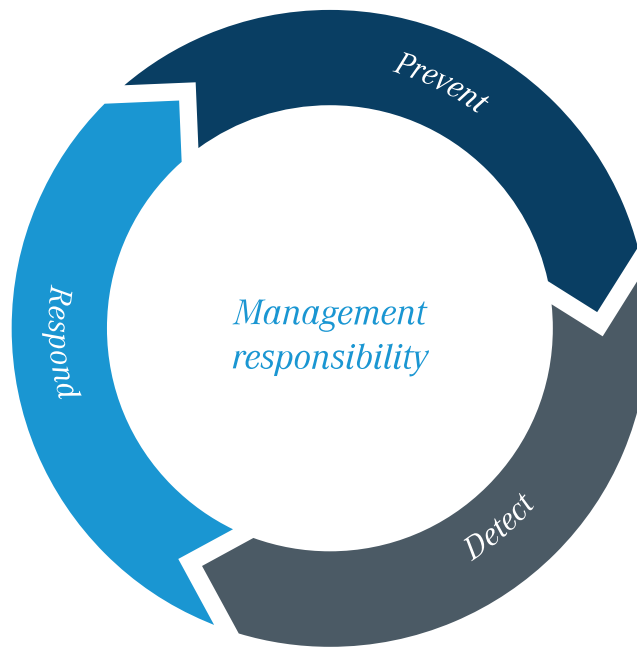
Lars Wagner
Chief Executive Officer and
Chief Sustainability Officer
MTU Aero Engines AG

“We see compliance as being about much more than merely fulfilling a legal requirement. MTU stands for integrity and responsible conduct. Indeed, we are convinced that this is the only way to transition to sustainable aviation and secure our company’s long-term success. By setting out a clear set of requirements, our Code of Conduct provides orientation in all of our working and business relationships.”

MTU condemns corruption of any kind as well as all other forms of white-collar crime. We do not tolerate immoral practices such as bribing or accepting advantages in business transactions. This is why preventing bribery and corruption are stated goals of our compliance activities.

MTU’s compliance system is based on three pillars: prevention, recognition and response. Instruments and actions have been implemented for each of these pillars. Taking an integrated approach ensures, for instance, that insights from processing and resolving cases of suspected corruption (respond) also flow into prevention efforts. The focus of our activities is on prevention.

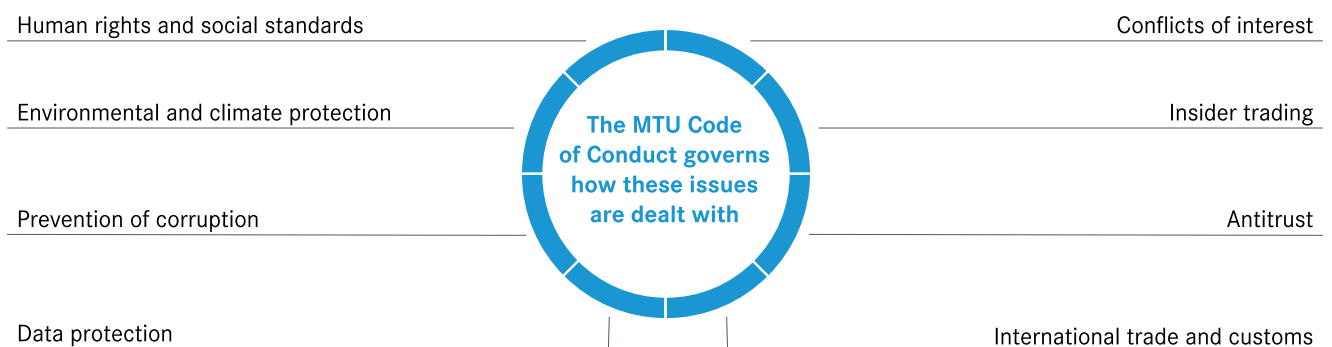
MTU's compliance system



Clear rules for integrity in everyday work and business life

MTU's Code of Conduct addresses central compliance topics such as preventing corruption and dealing with conflicts of interest. The Code defines clear standards for working with stakeholders such as customers, suppliers, authorities and partners. As such, it is an important tool for implementing responsible business practices.

MTU's Code of Conduct



[→ MTU's Code of Conduct](#)

All employees must be familiar with and comply with the legal provisions and company regulations relevant to their work. Managers have a particular responsibility to uphold these requirements and regulations and to act as role models. We also expect our business partners to fully comply with all applicable laws. A separate Code of Conduct covering compliance topics applies for suppliers. → [Code of Conduct for Suppliers](#) The MTU Principles (“We shape the future of aviation”) are an integral part of our corporate culture; they help us act in a consistent and reliable manner.

External standards and memberships

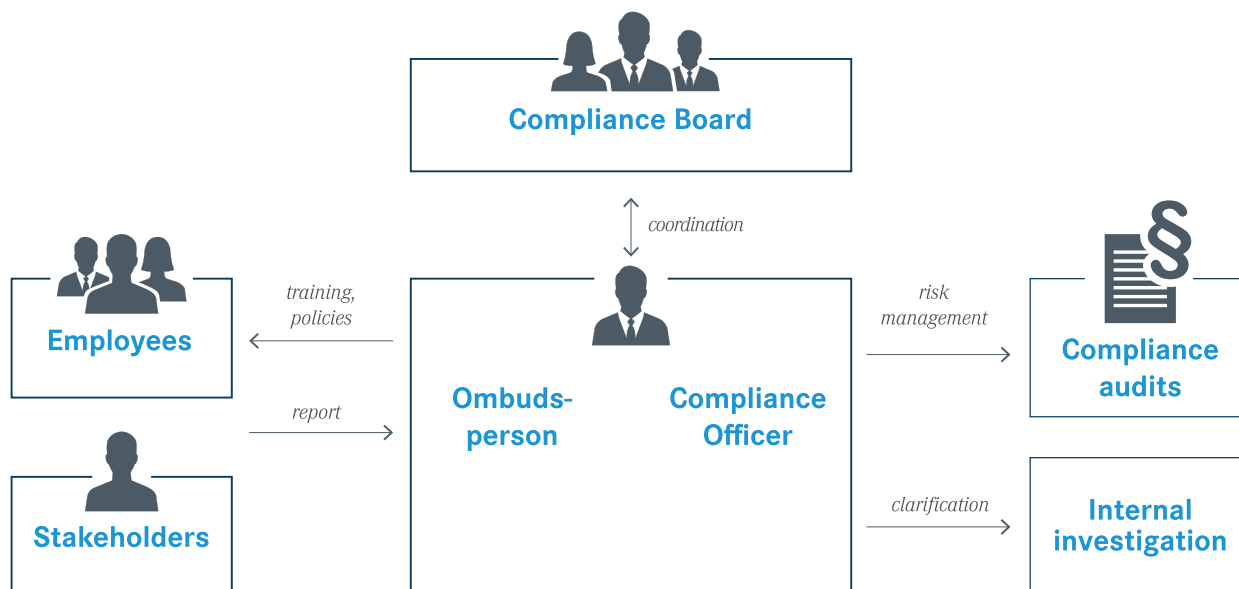
We have committed to the principles of the UN Global Compact (UNGC), one of which is preventing corruption within our company → [Principle 10 of the UNGC](#). In the interests of maintaining sustainable corporate leadership, we take our lead from the [German Corporate Governance Code](#), whose requirements we comply with fully ([MTU’s Declaration of Conformity for 2022](#)), and from international compliance standards, such as the [Good Practice Guidance on Internal Controls, Ethics, and Compliance](#) issued by the Organization for Economic Cooperation and Development (OECD). Our commitment to fighting corruption extends beyond the company as well; we are also a member of the [TRACE International anti-corruption initiative](#). Through the German Aerospace Industries Association (BDLI), we are represented in the [Aerospace and Defense Industries Association of Europe](#) (ASD), and we are a signatory to their standards against corruption and bribery and in support of equal and fair competition.

Compliance is teamwork

As the final decision-making authority, the CEO holds responsibility for the company’s business ethics and anti-corruption policy. The core functions responsible for ensuring ethical and correct conduct are a Compliance Board and a Compliance Officer. Both the Compliance Board, whose members are top managers from various departments, and the Compliance Officer hold Group-wide responsibility. The Compliance Officer’s duties include conducting preventive measures, investigating incidents of white-collar crime, and collaborating closely with the Compliance Board in further developing the compliance system. The Compliance Board holds regular and ad hoc meetings, the latter at the request of the Compliance Officer. The Compliance Officer provides quarterly updates to the Supervisory Board’s Audit Committee, which for its part informs the plenary meetings of the Supervisory Board. The Supervisory Board’s Audit Committee oversees the Executive Board’s compliance activities. In addition, the Compliance Officer has a regular direct reporting line to the CEO.

The managing directors of the sites must ensure that all compliance-relevant provisions and regulations are adhered to within their areas of responsibility, and they must see to it that compliance is appropriately embedded in the local organization.

MTU's compliance organization



The core functions responsible for ensuring ethical and correct conduct at the company are a Compliance Board and a Compliance Officer.

Safety brooks no compromise

We want to prevent compliance violations and ensure that business decisions are made with integrity. We do not tolerate any kind of conduct that violates laws or regulations. We respond to reports immediately and appropriately, and take disciplinary action in the event of detected violations. In such cases, MTU applies a principle of zero tolerance, which includes labor law measures as well as civil or criminal proceedings. There were no confirmed cases of corruption in the reporting year. No significant fines or non-monetary sanctions were levied against MTU for breaches of applicable laws, and it faced no legal action stemming from corruption or due to antitrust or anticompetitive practices.

Global whistleblower system

Our global whistleblower system allows employees and external stakeholders to report suspected instances of unlawful conduct to the Compliance Officer. Tips can also be submitted anonymously via the web-based iTrust reporting system, which is available in several languages. → [iTrust](#) The Compliance Officer reviews all submitted reports. If any are found to be credible, the Compliance Officer initiates the investigative steps necessary. The ways we have established for reporting non-compliance are communicated to employees through internal media channels and explained to external stakeholders in writing or on our website.

We treat the identity of the whistleblower and the information they impart as confidential—even if the suspicion turns out to be unfounded. This is ensured by means of an internal regulation. We wish to make it clear that whistleblowers acting in good faith shall not be penalized or disadvantaged by the company in any way—which is also ensured by means of an internal regulation. In addition, employees can confide in their superiors, the legal department or HR.

In the 2022 financial year, various tips regarding suspected misconduct were reported to the Compliance Officer via the reporting channels offered. However, in applicable cases—i.e. where misconduct could be proven—none of the tips related to violations severe enough to be significant for the company.

Risk-based approach

We have put various control mechanisms in place to ensure compliance throughout the company and to minimize risk. All [fully consolidated sites](#) are reviewed for corruption risks and regularly queried on compliance-relevant issues. The 2022 query revealed no significant incidents reported, and no significant corruption risk has been identified for any site. [For compliance and governance risks, see Annual Report 2022, p. 85](#) The Compliance Officer additionally inspects all sales support consulting contracts for possible corruption risks before they are placed or renewed, and found no indications of corruption in 2022. Potential sales consultants are also subject to an assessment by an independent provider of due diligence services. The contracts require the sales consultants to stipulate that the ASD anti-corruption standards are binding. The corporate audit department conducts regular audits in which it checks business processes and procedures for conformity to legal requirements and adherence to internal guidelines.

In addition, our dialogue with the political sphere is governed by certain rules. [More about our exchange with policymakers in the chapter Stakeholder dialogue](#)

Activities focus on prevention

To ensure a functional compliance culture, MTU puts a high priority on investigating possible forms of misconduct as well as communicating and raising awareness of compliance issues among employees. When new employees are taken on, we inform them about our Code of Conduct and require them to sign a declaration to uphold it. We regularly train our employees and managers across all hierarchies on the Code of Conduct and on specific compliance-relevant topics, such as antitrust law.

Training concept for compliance topics

Target group *Medium*



Our compliance training is tailored to specific target groups.

One way MTU chose to raise awareness of compliance topics among all its employees was with a training document for the Code of Conduct. We continued the training sessions in the reporting year. In 2022, a total of 3,131 employees had taken part. In addition, managers and employees who hold special functions, for instance in sales, attend regular mandatory anti-corruption training. In the reporting year, such corruption prevention training sessions were held regularly for the relevant employees in maintenance sales and at MTU Aero Engines Polska. In addition, we continuously provide information about and raise awareness of individual compliance issues, such as data protection, in a way suitable for each target group. The Compliance Officer and the legal department can also advise employees and managers as needed.

CONTINUOUS EDUCATION



3,131

employees were trained on the Code of Conduct in 2022 alone.

Responsible international trade

Another key compliance topic for us is observance of international trade law, also known as trade compliance. Customs and export control laws govern which products, services and technical data we are permitted to sell or provide and to where, to whom and for what purpose. This regulatory framework is binding for all the company's divisions, affiliates and employees worldwide. The need to comply with the applicable regulations is also specified in the MTU Code of Conduct. → [Statutory export control regulations are outlined in the non-financial statement in the 2022 Annual Report \(p. 112ff\)](#)

MTU has its own organizational unit dedicated to ensuring effective trade compliance: the international trade compliance department provides the internal framework for implementing uniform process standards throughout the company. These include a review of existing approval requirements, e.g. before shipping documents, software or components, as well as controls relating to bidding procedures vis-à-vis sensitive countries. The international trade compliance department has cross-divisional authority to issue certain directions, which extends to the right to stop deliveries. In addition, the department's head reports directly to the person in charge of exports at MTU (Executive Board).

Mandatory training for all employees affected by export control regulations continued during the reporting year with a new concept that was launched in 2020. Called the Internal Compliance Program, this concept was adapted in line with the legal framework applicable for the reporting year.

Data protection

In times of advancing digitalization, we seek to ensure comprehensive data protection. The protection of personal data in accordance with applicable legal provisions is laid out in the MTU Code of Conduct and is binding. When using digital applications, we were able to fully ensure that our employees' personal data was protected.

We have established a management system for data protection and expect all employees to comply with its regulations, a requirement that is also set out in the Code of Conduct. The Group's data protection guidelines ensure a uniform level with a standard that applies worldwide. We have appointed data protection officers or coordinators in all our Group companies, and they are instructed in all relevant regulations. The aim is to achieve uniform data protection and data security standards for the handling of personal data throughout the Group that meet the requirements both of the [EU General Data Protection Regulation \(GDPR\)](#) and of the national legislation applicable at each site, such as the [German Federal Data Protection Act \(BDSG\)](#). The Executive Board is briefed on data protection once a month. Regular audits and checks are carried out on workflows that process personal information, especially in the course of processing orders.

Data protection is part of our ongoing information and training offers for employees, targeted to the needs of different groups.

Once again in 2022, we had no reportable breaches related to customer data protection.

IT security

Given that all of MTU's key business processes have a highly advanced level of digitalization, ensuring the high availability and integrity of IT systems is a prerequisite for seamless business operations. MTU generates, maintains and processes large amounts of data with special confidentiality requirements—especially for but not limited to military business.

MTU has an IT security management system oriented at ISO 27001 and implements appropriate protective measures on a technical and organizational level to ensure its IT systems are stable and secure. The aim is to minimize damage caused by cyberattacks on the company and to safeguard corporate data and expertise. In addition, it is important to protect data and systems when collaborating and networking with business partners.

Global and local regulations lay out binding rules for all employees and managers governing the confidentiality of operational and business secrets, the protection of electronic data and how to work with IT systems and data media.

A dedicated central team is responsible for IT security, serving as point of contact within the Group. IT security officers in the centers and in legally independent associations act as local contacts for IT issues and implement IT security guidelines and requirements on-site. MTU management receives regular reports from the IT security officers regarding the company's external situation, current developments, and current and future defensive measures.

We invest heavily and continuously in technological and organizational actions to ensure the availability, confidentiality and integrity of the IT systems that we use and operate. We continuously reassess the risks associated with IT. The two risks deemed most critical are system failures due to technical error, and cyberattacks that result in the non-availability of systems, unauthorized publication of information or the permanent loss of data. MTU's IT security management covers technical and organizational actions to limit the negative effects of such occurrences for the company. During the reporting period, there were no cyberattacks and no failures that resulted in significant or severe consequences for MTU.

Services & tools

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GRI: 102-12, 102-16, 103-2, 103-3, 205-1, 205-2, 205-3, 206-1, 412-2, 418-1, 419-1

UNGC: 1, 10

INTERACTION WITH SOCIETY AND POLITICS

Stakeholder dialogue

Maintaining an open and constructive dialogue with our key stakeholders is an essential factor in the success of our company. We provide them with regular updates about MTU's sustainability goals and our progress, and receive valuable feedback in return.



Executive Board member Lars Wagner at the ILA 2022 in Berlin talking about emissions-free flight with German Economics Minister Robert Habeck.

During these times of transformation and in light of the complex challenges facing us, we are keen to exchange knowledge and information, provide orientation and create transparency about our role in the sustainable development of society and the economy. To this end, we maintain an open and proactive dialogue with key stakeholder groups. This stakeholder dialogue increases confidence and trust in MTU, raising acceptance for our business activities. It also gives us the opportunity to respond to suggestions, expectations and feedback, act on new topics in good time and thus better assess how our business activities affect society and the environment → [Materiality analysis](#).

MTU's stakeholder groups

Employees

Topics

- Health and safety
- Career and advanced training opportunities
- Compensation and benefits
- Work-life balance
- Diversity and equality of opportunity
- Co-determination
-
-

Forms of dialogue

- MTUnet (Social Intranet) and contact (employee magazine)
- Employee surveys (PulsCheck)
- Need-based information from the HR department
- Dialog and information events
- Company suggestion scheme
- Individual consulting sessions
- Online learning portal
- Welcome on Board program

Business partners and customers

Topics

- Product quality and safety
- Sustainable technologies
- Product fuel efficiency
- Human rights
- Compliance

Forms of dialogue

- Voice of the customer
- Trade fairs
- Corporate communications media channels

Suppliers

Topics

- Product quality and safety
- Environmental protection
- Responsible sourcing
- Compliance with MTU standards

Forms of dialogue

- Supplier portal
- Audits
- Supplier surveys
- Supplier Days

Capital market

Topics

- Product innovation/eco-efficiency
- Responsible corporate governance
- Human rights
- Compliance
- Climate protection
- Risk management
- Supplier management

Forms of dialogue

- Annual General Meeting
- Conferences and roadshows
- Investor discussions
- Trade fairs
- Ratings
- Financial communications

Science and research

Topics

- Developing new technologies
- Promoting research and teaching
- Networking between industry and research
- Study of engineering and scientific disciplines
- Recruiting

Forms of dialogue

- Joint research projects
- Work in MTU centers of excellence
- Trade fairs
- Visits from university student groups
- Presentations/discussions at universities

Media

Topics

- Innovation and technologies
- Aviation sector/eco-efficiency
- MTU as an employer
- Financial issues
- Site development
- Compliance

Forms of dialogue

- Press releases
- Press conferences and briefings
- Plant tours
- Internet / social media
- Trade fairs
- Studies

Region

Topics

- Social commitment
- Climate protection
- MTU as an employer
- Site development
- Compliance

Forms of dialogue

- Community partnerships
- Internet / social media
- Plant tours
- Stakeholder survey
- Museum open house days

Politics and public agencies

Topics

- Developing and promoting technology
- Climate protection, eco-efficiency
- Political frameworks and regulations
- Mobility concepts
- Site development
- Demographic change
- Globalization
- Compliance

Forms of dialogue

- Parliamentary evening
- Plant visits
- Trade fairs
- Political discussions
- Background talks
- Visits by political delegations

Associations and organizations

Topics

- Eco-efficiency
- Promoting innovation and technology
- Economic and labor policies
-
-

Forms of dialogue

- Meetings and committees
- Participation in forums and events
- Studies
- Expert discussions
- Cooperations with NGOs

Topics and dialogue formats

We provide information about the challenges, developments and technologies relating to sustainable aviation. Our focus is on achieving zero-emission aviation in the long term. The central topic of stakeholder dialogue in 2022 was again climate action in aviation, especially the realignment of our Claire technology agenda with the long-term goal of zero emissions. We presented this new agenda to the public at the ILA air show in Berlin. The dialogue on climate will focus on our innovative Water-Enhanced Turbofan and Flying Fuel Cell propulsion concepts, the role of sustainable aviation fuels, and the reduction of CO₂ emissions in production. We have also provided information on social issues, with a focus on cultural topics such as New Work, hybrid working and diversity.



For our stakeholder dialogue, we use our own formats and platforms as well as public forums: (clockwise) Virtual Annual General Meeting in April. Peter Kameritsch speaks at MTU's Capital Markets Day. The Parliamentary State Secretary to the Federal Minister for Digital and Transport, Oliver Luksic, talking with Lars Wagner at the ILA. Chief Program Officer Michael Schreyögg received Dr. Marie-Agnes Strack-Zimmermann, Chairwoman of the Defense Committee in the German Bundestag.

Communication with our stakeholders takes place over various channels and platforms so we can incorporate their interests and feedback. This dialogue is mostly tailored to the target group or a specific topic. We pursue this dialogue regularly, with the actual frequency determined by the need for communication and/or information.

We give our employees the opportunity to provide feedback and to participate. Surveys such as our regular PulseCheck allow us to obtain the latest views and opinions from the workforce. Special formats such as Ideation Challenges let us gather employee ideas about certain topics. → [More information under Research & development](#) We have established channels for specific sustainability topics on our social intranet, which offer an opportunity for interactive discussion.

We want to engage more closely with our customers on sustainability issues. For this, we will look to the existing Voice of the Customer tool, which Maintenance currently uses for regular customer feedback. Integration is planned for 2023.

Our social media posts increasingly feature sustainability topics. MTU channels have recorded increasing numbers of followers; at the end of 2022, there were 125,500. We posted regularly on all channels, using the hashtags #MTUFamily, #FutureOfAviation and #Sustainability. [Overview of our social media channels](#)

At our sites, we pursue a direct dialogue with the general public—for instance, with community representatives, neighbors and other interest groups—with a view to providing information about the potential effects of our business activities on our immediate environment. In the reporting year, we held an information event for the neighborhood about the geothermal project at our Munich site.

Online survey about sustainability

Our website invites stakeholders to rate and discuss our sustainability management and its goals. The results are incorporated into the annual assessment of the issues for MTU.

HOW DO YOU RATE SUSTAINABILITY AT MTU?

Reliable information for the capital market

We aim to provide comprehensive and reliable information about MTU as a sustainable investment. To this end, our investor relations team is in regular dialogue with investors and analysts, for example at the annual Capital Markets Day, roadshows and the Annual General Meeting. We also offer insight into our sustainability strategy and performance; for example, as these relate to climate action, via the CDP rating, or by means of regular holistic measurements of our performance, done via the ESG assessment tool EcoVadis.

OVERVIEW OF ALL SUSTAINABILITY RATINGS AND AWARDS

Political dialogue: Centrally coordinated representation of interests

MTU takes no party political position as a matter of principle. We purposely cultivate relationships with parties and factions on certain topics, as aviation is affected to no small degree by political decision-making, especially at the national and European levels. MTU's lobbying activities aim to provide political stakeholders with background information, views and concerns relating to core business issues, so that these can be taken into account in the political decision-making process.

Our key points of contact include elected representatives and decision-makers from ministries at the state, federal and EU levels as well as from subordinate authorities and the German Armed Forces. To ensure transparency and adherence to external and internal regulations, MTU's political dialogue is managed centrally by the Group Representation Office of the Corporate Communications department. In 2022, the main topics of the dialogue were emissions-free flight, sustainable aviation fuels, sustainable production and infrastructure, and promoting innovation. We pursue our industry-specific interests through memberships in various professional associations. → [Overview of our memberships in the GRI index under Organizational profile](#)

We do not make any financial or in-kind donations to political parties. All interactions in the political arena are carried out in compliance with the applicable legal and regulatory requirements and with our [Code of Conduct](#), and must be granted central approval. Donations to political parties or party-affiliated organizations are generally subject to approval by the Supervisory Board. Mandatory requirements are stipulated in our compliance management system and Code of Conduct, including those relating to donations, sponsorship, customer events, in-house events, hospitality and corporate gifts. Compliance with these rules and regulations is the responsibility of the relevant manager in each case and is ensured by means of an internal monitoring system.

We publish contacts with politicians on an ad hoc basis, e.g. on the occasion of site visits. These days, many politicians themselves also report on visits and contacts. MTU has instituted a self-imposed "quiet period" of six weeks prior to elections, during which visits from or events with elected representatives or candidates are prohibited so as not to offer them a public platform.

Germany's Lobbying Register Act (LobbyRG) stipulates that, as of the beginning of 2022, all organizations and companies that lobby the German parliament and federal government for representation of interests must be registered in the [Lobbying Register](#). We believe that transparency is a prerequisite for trust when it comes to representation for interests and the political process. MTU appears on the Register under entry number R02076.

We support our employees' right to pursue voluntary or political causes as private citizens. However, our employees are bound by the rules relating to conflict of interest laid out in our Code of Conduct. When it comes to private voluntary or political causes, we in no way pursue MTU's corporate interests. → [Donations & sponsorship](#) → [Compliance](#)

Services & tools

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GRI: [102-40](#), [102-42](#), [102-43](#), [102-44](#), [103-2](#), [103-3](#), [415-1](#)

UNGC: [10](#)

THE TOP PRIORITY IN AVIATION

Product quality and flight safety

Safety first—for us, safe flight operation is way more than just a legal requirement. In aviation, it is the highest priority. That’s why we place high demands on quality and safety—not least because reliable and high-quality products are our trademark.



MTU stands for sustainable quality management and pursues the vision of zero defects.

Quality and safety are of paramount importance in aviation and the conditions are strictly regulated. And complying with legal requirements concerning safety is subject to strict monitoring by the relevant authorities. This is mirrored in the high importance MTU places on product quality and flight safety. The company must comply with the legal requirements imposed upon it as an organization that develops, manufactures and maintains products, parts and equipment for the aviation industry. These include aviation-authority licenses, approvals and certifications as well as safety and environmental requirements as legally mandated by regulatory authorities. Through stringent quality standards, we ensure that these are implemented across the Group and at all levels of the value chain in accordance with the law, thus adding value for our customers and partners. Safe mobility solutions play an important role in the sustainable development of both society and the economy. Our vision is Zero Defects. In this, we stand for sustainable quality management.

A Group-wide [integrated management system \(IMS\)](#) ensures compliance with laws and internal regulations and clearly assigns responsibilities within the company. One principle of the IMS policy is that “safety takes priority in what we do.” The quality framework is enshrined in a management manual that is binding for all employees and managers across the Group. The company’s dedicated quality department, Corporate Quality, is directly subordinate to the Chief Operating Officer (COO) and reports quarterly to the full Executive Board on quality aspects and flight-related incidents. Through independent, accredited external auditors, we regularly validate and certify our IMS. MTU Safety Management in accordance with the [International Civil Aviation Organization \(ICAO\)](#) standard is part of the IMS and defines how to handle safety-related air-traffic events. Appropriate organizational structures and responsibilities, such as a Flight Safety Board and a Flight Safety Manager, have also been established.

High quality standards together with product safety and reliability are enshrined in the MTU Principles as key corporate objectives. MTU's quality vision for 2025 also aims at error-free quality and product safety in flight, as well as high customer satisfaction.

Focus on the entire lifecycle of a propulsion system

We take into account all safety and environmental requirements of regulatory authorities in the early stages of developing new engines for later use, and compliance must be documented as part of the certification process. We employ a comprehensive testing program involving test rigs and test series to validate the safe flight operation of our products. This includes safe operation during a hailstorm or a bird strike (following a bird ingestion event) and complying with strict limits on pollutants and noise emissions. MTU components frequently exceed aviation authority requirements, because our customers demand high standards when it comes to fail-safe operation and eco-efficiency. In addition, our manufacturing and maintenance of engine parts and modules meets all required occupational safety and climate protection standards.

We examine our engine modules for their impact on the environment, health and safety throughout their development, production and operation lifecycles. Accordingly, we cover all major stages of a product's service life. The key to our continuous progress is the development phase.

We use only fault-free and clearly identified components that have been approved by the appropriate aviation authority and are based on approved development documentation. They must also have been produced or maintained in compliance with aviation regulatory processes by a company officially authorized to do so.

BREACHES OF COMPLIANCE



0

We refuse to compromise on quality. What does that mean? In 2022, we didn't record a single breach of legal or internal compliance regulations with regard to the quality and safety of our products.

The aviation sector has strict rules governing documentation in order to verify the airworthiness of components and engines. There must be no gaps in documentation for the product's entire service life. We hold our suppliers to the same standards and audit them regularly to ensure compliance. To ensure quality and safety requirements are upheld, we have implemented comprehensive monitoring and testing processes along the entire value chain. Safety-critical components (engine components are categorized into various safety classes) are subjected to particularly rigorous testing to verify their technical quality. Strict requirements also apply to materials. Since fail-safe materials are a basic prerequisite for aviation safety, all engine components, including all materials we use, must be approved by the aviation authorities after undergoing extensive test series.

In the reporting year, there were no breaches of statutory regulations regarding compliance in connection with the purchase or operation of our products that resulted in a fine, sanction or warning for MTU.

Sustainable quality management

At MTU, we develop and refine our quality system together with our standards and regulations on an ongoing basis. This involves applying the ideas that emerge, for example, from collaboration in the [Aero Engine Supplier Quality Group \(AESQ\)](#) or from regular exchanges of experience and information among our quality managers in the aviation industry. Continuous development primarily concerns MTU's body of rules and regulations, its internal quality reporting system and especially the digitalization of quality processes.

We include all our employees in our high quality standards. Managers and employees receive site-specific training on quality issues. All employees receive IMS training. In addition, we are committed to a positive no-blame culture at MTU, characterized by openness and collaboration, and provide ongoing training on this subject.

We have customers and authorities conduct regular internal and external audits of quality issues to ensure that the uniformly high standards within the company are adhered to and that they comply with the regulatory requirements.

Through various initiatives to continuously improve product and process quality, we are supporting our business growth following the pandemic-related crisis:

- The Passion for Quality campaign, part of our quality vision, focuses on making employees' contribution to quality visible in all areas of the company and raising quality awareness (Munich, Hannover, Berlin, Rzeszów, Vancouver sites)
- The MRO network development project aims to standardize core processes in commercial engine maintenance across all MRO sites on the basis of best practices
- With the AS13100 Implementation project, MTU is implementing new industry-wide standards jointly developed in AESQ as well as new requirements in quality management (Munich, Rzeszów)

Further increase customer satisfaction

A high level of product quality and safety is crucial for customer satisfaction and our competitiveness. As in previous years, "We increase the satisfaction of our customers" remained an overarching corporate objective for 2022. The secondary objectives were defined in more concrete terms, with the aim of ensuring that MTU remains an attractive partner for its stakeholders through the high performance and quality of its products and services. IMS, our certified integrated management system, supports us in ensuring customer satisfaction, process orientation and continuous improvement in all phases of development, production and maintenance. IMS takes into account, for example, the requirements of the standards ISO 9001, EN/AS9100, ISO 14001/EMAS and ISO 45001, and serves as a model approach in the aviation industry.

We set great store by customer complaints as an indicator of their satisfaction with the quality of MTU products. We follow up and analyze all customer complaints relating to products delivered in substandard quality. Appropriate measures are then defined and implemented so as to permanently eliminate the cause of the defects. Success of these measures is closely monitored. Customer complaints are assessed at the site level. At two sites, the number of customer complaints increased compared to the previous year; for the majority of sites, it decreased or remained constant.

Taking valuable feedback on board

MTU Maintenance offers maintenance and additional services for aircraft engines and industrial gas turbines, and is thus active in the end-customer business. Direct interaction with customers, specifically airlines, leasing companies and energy producers, forms the basis of customer care. Once a quarter, we use an IT-based “voice of the customer” module to measure current customer satisfaction levels for our Hannover, Ludwigsfelde and Vancouver sites and for all main products. Each customer has the option of providing feedback about product quality, service, logistics and contractual terms. We use this valuable feedback to identify areas for improvement and initiate measures accordingly. Doing so allows us to continuously optimize our performance, increase customer satisfaction and stay competitive. In addition, MTU Maintenance Lease Services runs its own system for measuring satisfaction in the engine leasing and asset management business. We want to engage more closely with our customers on sustainability issues and will use the Voice of the Customer tool to do so. Integration is planned for 2023.

[More information about dialogue with our stakeholders](#)

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TOWARD ZERO EMISSIONS

Climate impact of aircraft engines

With its innovative propulsion products, MTU is often a technology pacesetter. We are also currently hard at work on new generations of propulsion that are still more sustainable. Never before have we had such forward-looking concepts as we do today.



We presented this model of the Water-Enhanced Turbofan (WET) at the ILA 2022 in Berlin. MTU's propulsion concept reduces fuel consumption, all emissions that have a negative climate impact, and contrail formation.



Zero emissions—this is MTU's vision and overall goal when it comes to reducing the climate impact of propulsion systems in flight operations. By taking on responsibility for climate action, we want to help achieve the goals laid out in the Paris Agreement, which serves as a focal point in technology development. MTU bases its own objectives on the EU Green Deal, which is derived from the Paris target of a 1.5 degree increase and aims to achieve climate neutrality by 2050. In addition to evolutionary and revolutionary propulsion concepts, our Clean Air Engine technology agenda, or Claire, also includes a quantification of the potential in reducing climate impact and energy consumption. We want to achieve these goals in three stages.

The focus is no longer on CO₂ emissions alone, as was previously the case, but on the overall climate impact of air traffic. That includes non-CO₂ effects, triggered mainly by emissions of nitrogen oxides and the formation of contrails. In response to this paradigm shift, MTU realigned its Claire agenda in the reporting year and presented it to the public at the ILA airshow. We have set out time horizons, targets and implementation options in Claire, taking into account the three application areas of aviation—short-haul, medium-haul and long-haul.

Clean Air Engine – Claire

With our Claire technology agenda, we are taking off into a new future of aviation. Emissions-free flight—a vision that drives us.

MORE IN OUR SPOTLIGHT

The aviation industry is characterized by long product cycles. As a rule, aircraft engines spend up to 30 years in service before they are decommissioned. Climate goals have a long-term perspective and are established in memoranda of understanding by stakeholders (airlines, aviation industry, research, aviation authorities), such as Fly the Green Deal, Europe’s vision for climate-neutral aviation. If they are to be effective across the board in 2050 and help in achieving climate neutrality, propulsion products that enable climate-neutral flight must be brought to market well before then. That is why we are ramping up the development of completely new propulsion concepts that go above and beyond the conventional gas turbine. For these revolutionary engine architectures, we collaborate with partners from industry, science and research, such as Bauhaus Luftfahrt or the German Aerospace Center. In parallel, MTU is working to enhance existing propulsion systems, such as the highly efficient geared turbofan (GTF) together with Pratt & Whitney, and to couple these with sustainable fuels.

Fast Facts: The geared turbofan

EVERY



20

seconds, a GTF takes off somewhere in the world.

MORE THAN



3

billion liters of kerosene were saved over 18 million flight hours.

MORE THAN



10

million metric tons of CO₂ were thus also saved.

Compared to the previous engine generation, as of: Q1 2023, according to information from Pratt & Whitney

Evolutionary and revolutionary concepts for climate-neutral aviation

Together with our partner Pratt & Whitney, we are offering a highly efficient propulsion concept: the GTF engine family, used in modern narrowbody aircraft (A320neo as well as Airbus A220 and the Embraer E-Jet E2 family). Compared to the previous generation, engines of the GTF family reduce energy consumption and CO₂ emissions per trip by 20% each. Flight testing of the GTF Advantage, a technologically enhanced GTF version for the A320neo family, began in the year under review.

This engine family has become a major business success and measurably reduces the burden on the environment: This first generation has already enabled airlines to save more than 10 million metric tons of CO₂ in 18 million flight hours (as of Q1 2023, according to information from Pratt & Whitney). It also brings significant improvements in terms of NO_x emissions, which are 50% lower than those of its predecessor.

To exploit the GTF's full potential, MTU is working with Pratt & Whitney to prepare the next generation of the product. Many of the technologies required for this are being developed as part of the German Federal Aviation Research Program (LuFo). In its second round, LuFo approved several collaborative projects on new compressor and turbine technologies in 2022. Numerous drafts submitted by MTU were also approved during the draft phase of the third LuFo round. The main focus here will be on improving component efficiencies as well as materials and digitalization.

Sustainable aviation fuel



Sustainable aviation fuel (SAF) will play a major role in efforts to achieve climate neutrality. SAFs can be used in admixtures of up to 50% as a “drop-in” fuel—i.e., without the need to adapt the aircraft or engine. MTU maintains an ongoing dialogue with relevant stakeholders and participates in studies to support the introduction of SAF; for example, through its membership in the Aviation Initiative for Renewable Energy in Germany (aireg e.V.), an association of airlines, manufacturers and research institutions. An aireg study on sustainable fuels published in 2022 with the involvement of MTU highlights the great potential of SAF.

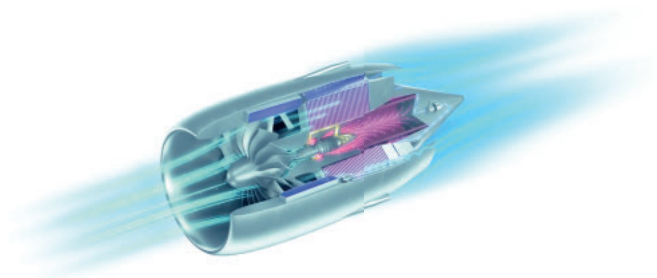
A feasibility study on electricity-based SAF was completed in 2022 as part of the CleanTech in Aviation working group, of which MTU is a member and which is chaired by the Bavarian Ministry of Economic Affairs, Regional Development and Energy. The working group aims to set up a power-to-liquid plant in Bavaria for the production of SAF.

From evolution to revolution – We go one step further

Our WET concept: Wet combustion thanks to the Water-Enhanced Turbofan

As outlined in our Claire agenda, purely evolutionary technology development will not be enough to achieve climate neutrality by 2050. Revolutionary propulsion concepts are needed. MTU's favored technology is the Water-Enhanced Turbofan (WET). Utilizing thermal energy from the exhaust gas stream, it uses a steam generator to vaporize water, which is then injected into the combustor. The water for this purpose is extracted from the exhaust gas by means of a condenser. "Wet" combustion of this kind massively reduces nitrogen oxide emissions, while also substantially decreasing fuel consumption, CO₂ emissions and the formation of contrails.

CLEAN AVIATION: THE SWITCH PROJECT



→ [To the press release](#)

SWITCH stands for Sustainable Water-Injecting Turbofan Comprising Hybrid-Electrics. The project focuses on combining two revolutionary technologies: MTU's Water-Enhanced Turbofan concept, and hybrid-electric propulsion system components. Work centers on Pratt & Whitney's Geared Turbofan™ engine. The goal is to demonstrate a 25% reduction in fuel consumption and thus also of carbon emissions. Furthermore, the project aims to reduce nitrogen oxides and particulate emissions as well, thus minimizing overall climate impact.

Flying Fuel Cell (FFC): Virtually emissions-free

Another revolutionary propulsion concept is the full electrification of the powertrain. The MTU concept is called the Flying Fuel Cell™ (FFC) and is set to be deployed soon on short-haul routes in regional air traffic. This propulsion system does not produce any emissions of CO₂, NO_x or particulates; MTU has been able to win research support for this concept, particularly in the context of the third LuFo round—several project outlines for the development of an aviation-optimized system received positive responses.

Even if 2050 still seems a long way off, urgent action is required now, as aircraft development and product cycles are measured in decades. If we are to shape the future of aviation, a number of key developments must be set in motion today. MTU has embarked on this journey with its Claire technology agenda. In keeping with the MTU Principles: We shape the future of aviation—a green future.

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REDUCING ENGINE NOISE AND EXHAUST GASES

Health impact of aircraft engines

As part of our product development, we are working to make aviation considerably quieter and cleaner. Our stated goals therefore include reducing aircraft noise and exhaust emissions to minimize the impact that our products—in the air and on the ground—have on people’s health.



Through our Clean Air Engine agenda, we are pursuing a reduction in aircraft noise emissions in addition to our targets for climate action. At our sites, we carry out noise measurements on our test stands.



We undertake to protect the environment; climate action is one part of this, but our endeavors go further still. With quiet and clean engine concepts, we can improve the situation for residents living near and around airports in terms of noise pollution and local air quality, thereby promoting society’s acceptance of air travel. As with our approach to climate action, we have established several pillars to anchor the issue of aircraft noise in the company. In our [global Code of Conduct](#), we commit to environmental protection and explicitly to reducing noise and exhaust emissions from aircraft engines. We want to set standards in this area, and we have formulated our goal accordingly. The MTU Principles also include the requirement to create products with lower noise and pollutant emissions under the heading “Environment & society.”

To receive certification from aviation authorities both aircraft and engines must meet noise and emissions limits set by the [International Civil Aviation Organization \(ICAO\)](#); in the past, these limits have been successively tightened. National aviation authorities are responsible for certification. Furthermore, at almost every airport in the world, the fees charged for takeoff and landing are dependent on the noise emissions of the aircraft model.

How is aircraft noise generated?

Aircraft noise is caused by both the engine and the aircraft itself. Noise during takeoff is largely due to the engine's fan and nozzles; during landing, the aircraft also adds to noise as a result of turbulence around the fuselage, wings and landing gear.

The core engine accounts for a relatively small proportion of aircraft noise.

In the certification of new aircraft models, noise is measured using a standardized process at three defined points and then cumulated. Aircraft noise has decreased continuously since the 1960s, by a total of about 17 EPNdB (effective perceived noise decibels; a specific unit for measuring the relative noisiness of aircraft) or about 70%.

Quieter flying: We are pushing for Europe's SRIA noise targets

With our technology agenda Clean Air Engine (Claire), we are pursuing not only climate action targets → [Climate impact of aircraft engines](#), but also targets for reducing aircraft noise emissions. Achieving future noise limits is one of the agenda's core elements. MTU's acoustics experts are involved in our projects at every stage of product development, from technology management to subsequent propulsion system design and optimization.

When developing future propulsion systems, we support the goals of the [European aviation industry and research sector's Strategic Research and Innovation Agenda \(SRIA\)](#), which calls to reduce noise to 65% of its 2005 levels by 2050. With the first-generation geared turbofan, which we developed together with our partner Pratt & Whitney and continue to manufacture, we have already significantly reduced aircraft noise emissions as part of Claire Stage 1. They are on average 15–20 EPNdB (cumulated over the three ICAO measuring points) below the current legally stipulated noise emission class, ICAO Stage 4. This equates to a reduction in the geared turbofan's noise footprint (spread of aircraft noise near airports) of 75% compared to the previous generation.

LESS AIRCRAFT NOISE



75 %

smaller noise footprint of our geared turbofan from Claire Stage 1 has significantly reduced the spread of aircraft noise in the sensitive area around airports. The geared turbofan already has over four million quieter flights to its name.

The geared turbofan from Claire Stage 1 has an architecture that harbors vast potential for further reducing noise compared to conventional turbofans. By making improvements to the latest generation, we want to achieve the SRIA goal of a 50% reduction in aircraft and engine noise emissions by 2035 (base year 2000).

According to the SRIA, new engine architectures are even to achieve a 65% drop in noise emissions by 2050 (base year 2000). Our efforts here include our new propulsion concept, the (hydrogen-powered) Flying Fuel Cell™, which can achieve massive reductions in noise because the fan is the powertrain's sole source of noise. It is set to be ready for short-haul routes by 2050.

New concepts pave the way for zero pollutants

In addition to contributing to climate effects and generating noise, air traffic also has an impact on local air quality at airports and in surrounding areas. The combustion process in aircraft engines produces pollutants in the form of nitrogen oxides (NO_x), carbon monoxide (CO), unburned hydrocarbons (UHC) and soot/particulate matter. In terms of the impact these have on health, NO_x and particulate matter emissions are the most significant. To obtain type certification, aircraft and propulsion systems must meet ICAO environmental standards. ICAO has defined limits for the levels of NO_x, CO, UHC and soot emitted by aircraft engines. All of the engines in which MTU holds a workshare meet the ICAO certification standards. In the meantime, compliance with standards for ultra-fine particulate emissions became a criterion for engine certification. Unlike with noise emissions, we have less scope to influence NO_x and particulate matter emissions and the health effects because the combustor is not part of our portfolio for commercial engine programs. We can make a difference here only indirectly by improving the efficiency of the engine. For example, with the geared turbofan we have succeeded in significantly reducing NO_x emissions, which are 50% lower than those of its predecessor. Sustainable fuels can also make a big difference in this regard. In initial tests, the German Aerospace Center (DLR) has shown that particulate emissions from combustion are significantly lower with sustainable aviation fuels (SAFs) than with conventional aviation fuels. Using hydrogen as a fuel reduces them even further.

REDUCTION IN NITROGEN OXIDES



80 %

Our new propulsion concept WET can significantly reduce pollutants. It works by injecting water into the combustor, which, based on what we know so far, can cut NO_x emissions by up to 80%.

Our development of revolutionary propulsion concepts, which is part of our climate action activities, also holds great potential for reducing pollutant emissions. Our Water-Enhanced Turbofan (WET) and Flying Fuel Cell (FFC) concepts can significantly reduce pollutant emissions or even avoid them altogether. The WET concept works by injecting water into the combustor, which, based on what we know so far, can cut NO_x emissions by over 80%. Hydrogen-powered fuel cells would actually emit nothing but water.

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INNOVATIONS FOR A SUSTAINABLE FUTURE

Research & development

We are a technology leader in aviation—and it is our extensive research work and high level of innovation that keep us in this top position. Our ideas and concepts aim to transform aviation. With our research and development work, we are playing a key role in realizing a sustainable future for aviation.



MTU employees introduced a new measurement technique in PW1100G-JM final assembly; this engine belongs to the highly efficient GTF family. At MTU, numerous experts work on creating innovations and new solutions for the future.



We are committed to the principle of integrated environmental protection, which takes a precautionary approach to how the company's products impact the environment and integrates insights from this into entrepreneurial decisions. This applies above all to our research and development work. In the technology and innovation process, our experts investigate environmental and societal driving forces for aviation and take them into account when defining MTU concepts and targets. We receive input for our analyses and stakeholder expectations through various channels as part of our stakeholder dialogue, which we conduct on an ongoing basis with all stakeholders. → [More about stakeholder dialogue](#)

Shaping the future sustainably with innovations

MTU manages technology development for future products using a multistage process. In the medium term, advanced product designs are created and technology requirements derived from them. And over the long term, pilot concepts are developed with the help of a technology radar, and the development of enabling technologies initiated. One example of an advanced product design is the next-generation geared turbofan; pilot concepts are the Water-Enhanced Turbofan (WET) and the Flying Fuel Cell. An Innovation Board regularly discusses all topics related to technology and innovation and initiates technology projects and studies. The technology steering committee (TLA) is responsible for MTU's technology roadmap and is regularly updated on its progress. During the reporting year, MTU realigned its Climate agenda, which was approved by the TLA and thus by the Chief Operating and Chief Program Officers. → [For more information, see Climate impact of aircraft engines](#)

The basis of this technology process is our culture of innovation, which we cultivate with a variety of initiatives. These include a Group-wide innovation management concept; the Inno Lab, our creative think tank; and Ideation Challenges, through which we gather and evaluate ideas from employees related to a specific field of innovation.

Innovation Day

Innovations don't just come out of the blue, but must be systematically developed and implemented toward a specific goal.

Our experts throw themselves into their work with great enthusiasm as they shape the future sustainably through their accomplishments. MTU has a laudable tradition of honoring promising projects every two years as part of Innovation Day. In 2022, projects in five different categories were highlighted.

Our employees have top qualifications in fields as diverse as acoustics, fuel cells, 3D printing and bionics. A total of around 1,000 engineers work at MTU, collaborating with six centers of competence and 16 universities to create new and innovative solutions for the future. Read more in the chapter → [Corporate social responsibility](#). We also achieve our excellent position by patenting our work; at the end of the year, MTU's patent portfolio contained 2,675 individual patents.

Research and development budget further increased

In the reporting year, MTU invested heavily in sustainable innovation: our investment in research and development (R&D) in 2022 totaled EUR 265 million (2021: EUR 230 million). With our R&D activities, we are actively promoting sustainable, zero-emission aviation while investing in MTU's future at the same time. R&D activities focused on performance improvements in the geared turbofan programs, technology studies for future generations of propulsion systems with an emphasis on hydrogen and flying fuel cells, and the expansion of capabilities in the area of virtual engines.

PIONEERING INVESTMENTS



265 m euros

We spent 15% more on research and development than in the previous year. These are investments in a green future. One area of focus is to make emissions-free flight a reality.

Strong research network

To sustain MTU's technological expertise, it is important to be adequately plugged into the research landscape. We maintain a network of some 100 universities, research institutions, and companies around the world. → [MTU's research network](#) MTU is involved in major research programs in Germany (LuFo aeronautics research program) and Europe (such as Clean Aviation) that push the development of ecologically efficient propulsion technologies for aviation. These programs bring together researchers from a wide range of manufacturers, universities and major research institutions.

RESEARCH PARTNERS



100

We have access to a strong network of universities, research institutions and companies and participate in important aviation research programs.

One cutting-edge technology program is the SWITCH project; launched in 2022, it combines MTU's Water-Enhanced Turbofan with hybrid-electric propulsion elements based on the geared turbofan. In addition, research into green technologies for aviation was further advanced as part of the Federal Aviation Research Program (LuFo) in Germany. Numerous project outlines and projects were approved for MTU concepts in 2022.

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HIGH STANDARDS IN SITE OPERATIONS

Environmental management

Environmental protection is a maxim guiding how we do business. We want to be efficient in our use of energy and resources, minimize emissions and avoid environmental risks. Continuous improvement has been achieved in particular in the reduction of energy consumption and CO₂ emissions.



Our environmental management for site operations includes monitoring of our energy consumption as the basis for efficiency measures, which come into effect in, for example, our company climate action strategy, ecoRoadmap.



Operational environmental protection at our production sites is an important principle guiding our behavior and is implemented in MTU's business processes. It is also enshrined in the [global Code of Conduct](#) for all employees as well as in our [Policy Statement on the Protection of Human Rights](#). The Executive Board assumes responsibility for company-wide environmental protection and climate action.

Standards are applied through a management system that defines processes, responsibilities and targets at the site level. Environmental protection is part of MTU's [integrated management system \(IMS\)](#). The environmental criteria apply to all divisions and processes and are laid down in documented process flows and special company standards. Minimum operating standards for our machines and facilities, such as engine test cells, are laid down by national legislation and subordinate regulations.

In our global Code of Conduct, MTU commits to an integrated approach that incorporates environmental protection and climate action into its business decisions. Environmental responsibility is also enshrined in the MTU Principles in the section entitled “Environment and society.” In addition, MTU’s mandatory [Code of Conduct](#) commits suppliers to act in an environmentally conscious way.

The Executive Board receives a quarterly IMS report on environmental and climate action data. Since 2021, the report has included the energy consumption of the production sites in Munich, Hannover, Ludwigsfelde, Rzeszów and Vancouver (measured in terms of production hours). Regular reports on CO₂ reductions in site operations (Munich, Hannover, Ludwigsfelde and Rzeszów) to the Executive Board and the management are part of MTU’s climate strategy.

GREEN INVESTMENT



11.4 m euros

We spent this amount on investments and ongoing expenses for environmental protection and climate action at our German production sites in 2022.

Environmental management is not centralized, with the environmental departments at all production sites assuming responsibility for the local implementation of relevant rules and regulations. Individual site managers are directly responsible for environmental protection; they receive advice and support from the local specialists. Those specialists regularly share their innovations and best practices with each other. The German sites are certified to [ISO 14001](#), the international standard for environmental management systems, and/or to the [EU Eco-Management and Audit Scheme \(EMAS\)](#).

Getting employees involved

We get our employees involved in active environmental protection via information campaigns and training courses—for instance, to motivate them to conserve energy at work. This is done, for example, as part of the initial instruction for new employees, in the form of special awareness days and through short videos on how to protect the environment in day-to-day life. The Code of Conduct stipulates measures to support employees in acting in an eco- and climate-conscious way.

We maintain a dialogue with our stakeholder groups about MTU’s environmental impacts. Through environmental statements, the MTU sites in Munich, Hannover and Ludwigsfelde inform the public annually about their environmental impacts and performance. Stakeholders can use the available media channels to direct complaints and report abuses to us, which we will immediately follow up. This applies to employees, suppliers, residents and other stakeholders. In the reporting year, we received no complaints regarding negative environmental impacts. At the German sites, environmental officers are available to answer any questions or comments. → [More information about stakeholder dialogue](#) In addition, stakeholders can provide feedback about sustainability issues via an online survey on the MTU website.

ENVIRONMENTAL STATEMENTS FOR PRODUCTION SITES

We also pursue environmental protection and climate action through joint initiatives. Besides its commitment to the [UN Global Compact](#), whose ten principles include environmental sustainability, MTU is also involved in several local initiatives. These include the [BEEN-i Bavarian Energy Efficiency Network Initiative](#), the Unternehmensnetzwerk Klimaschutz corporate climate action network, the [Munich Business Climate Pact](#) and the [Bavarian Environmental and Climate Pact](#).

Emergency management plans have been prepared to deal with operational disruptions with a negative environmental impact, and a crisis committee has been set up. We also hold regular staff drills and provide instructions on what to do in the event of an emergency. In 2022, there were no incidents with a negative environmental impact, nor were any fines levied against the company for breaches of statutory requirements relating to the environment. No non-monetary sanctions were brought against MTU.

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ON THE WAY TO MTU GREEN GLOBAL

Climate action at the production sites

We are realigning our energy management to permanently reduce our use of fossil fuels and emission of greenhouse gases in production and maintenance. More green energy and CO₂ avoidance are key here. In the long term, MTU aims to achieve climate neutrality in its site operations. As of 2045, we want all the Group's production sites to be carbon neutral for Scope 1 and 2.



MTU's own green electricity production via photovoltaic systems in Munich and Rzeszów heralds the transformation toward green energy.



MTU aims to continuously reduce the greenhouse gas emissions resulting from manufacturing and maintenance work at its facilities as a contribution to global climate action in line with the objectives of the Paris Agreement. In 2021, MTU launched its ecoRoadmap climate action strategy for its headquarters in Munich. The following year, this strategy was expanded to all European production sites (Munich, Hannover, Ludwigsfelde, Rzeszów) under the banner of MTU Green Europe. Green Europe aims to reduce MTU's carbon footprint by 60% by 2030. This effort will involve sustainable measures, the expansion of our own emissions-free power generation and the increased use of green energy (measured in terms of significant emissions from Scope 1 and 2, base year: 2019). We compensate for any unavoidable CO₂ emissions that arise through operations at the Munich site by means of high-quality offsets, such that we have been able to operate this location on a climate-neutral basis since 2021. The integration of the production sites in Canada and Serbia (in operation since 2022) into the climate strategy starts in 2023. Langfristig strebt die MTU Klimaneutralität im Standortbetrieb an. In the long term, MTU aims to achieve climate neutrality in its site operations. By 2045, we want all the Group's production sites to be carbon neutral for Scope 1 and 2 without offsetting.

Fast Facts: #GreenMTU

FOOTPRINT



60 %

CO₂ emissions of the production sites to be significantly reduced by 2030 (base year 2019).

DEEP GEOTHERMAL ENERGY



80 %

We want to cover our heating needs at the Munich site mainly by using thermal water from the ground.

GREEN ELECTRICITY



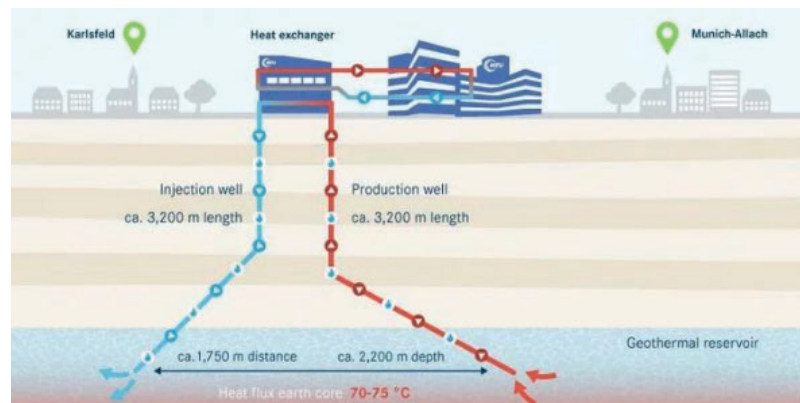
75 %

MTU's electricity consumption already comes mainly from renewable sources.

More green energy for MTU

Our climate action experts are developing sustainable measures for the Green Europe locations and are implementing them together with the departments. These measures include replacing equipment with low energy efficiency, systematically fixing compressed-air leaks and better insulation through roof greening and renovation. MTU's own green electricity production via photovoltaic systems in Munich and Rzeszów heralds the transformation toward green energy. The emission factor for electricity used at the locations in Hannover and Munich has improved compared to previous years. At the Poland site, electricity consumption is completely emissions-free for the second year in a row. More than 75% of the company's total electricity consumption already comes from renewable sources. For the Munich site, MTU continues to advance deep geothermal energy, having carried out exploratory drilling on the site in 2022. By using thermal water from the ground to supply heat, the site could become largely independent of fossil fuels starting in late 2024.

MTU PLANS TO USE GEOTHERMAL ENERGY



→ [More information](#)

Following promising preliminary studies, MTU has decided to press ahead with its plans to use geothermal energy at the Munich site. The aim is to make the site's heat supply largely independent of fossil fuels.

In addition, the production sites have been implementing local environmental programs that predate the ecoRoadmap. The Hannover site has, for example, focused on implementing measures to reduce gas and electricity consumption in machinery and building management. The Eco Facility 2025 project at the location in Rzeszów, Poland, aims to reduce environmental impacts and to promote environmentally conscious behavior among the workforce: improvements in media and material consumption as well as in the amount of waste generated are expressed in terms of CO₂ to raise awareness.

When it comes to climate action at its sites, MTU also counts on its employees' ideas and participation. As part of an eco-ideation challenge in 2021, employees submitted concepts for low-emission site operations in Munich. The resulting ideas are both pursued in the departments (e.g. in logistics) in a decentralized manner and developed further in a centralized manner (e.g. for heat neutrality).

Employees plant trees at the Forest Day



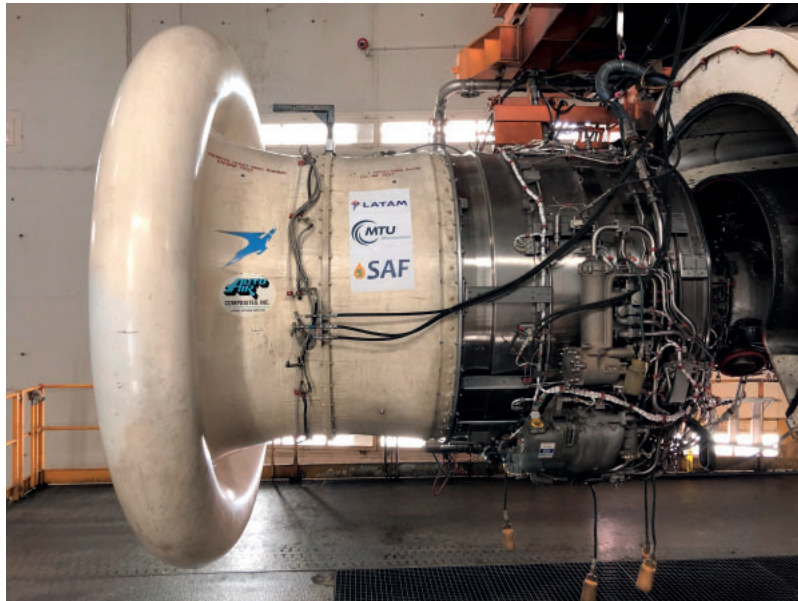
At MTU's first Forest Day in Dietramszell, Bavaria, apprentices and employees planted larches and spruces. After a walk through the trees guided by the forest ranger, the MTU crew lent a hand to the gradual conversion of the wooded area from pure stand to mixed forest.

Energy consumption in 2022

CO₂ emissions in production and maintenance (Scope 1 and 2) essentially result from the energy consumption required for site operations. Regarding non-renewable primary energy, we use natural gas and the aviation fuel kerosene as well as fuels for mobility, which make up a very small proportion of the total. In Munich, we generate electricity and heat using a cogeneration plant (BHKW), which is much more efficient and emits less pollution than a conventional power plant. We intend to use more photovoltaic energy in the future, and we have commissioned our first photovoltaic systems at the Munich and Rzeszów sites. In addition, the Hannover site makes use of solar energy with the aid of a solar thermal power plant and also employs a cogeneration plant comprising three micro gas turbines for generating electricity and heat. What's more, a new heat pump for combined heating and cooling went into operation in 2022. We also achieve greater energy efficiency by having the sites use waste heat from compressed air generation as thermal energy (combination principle).

The total energy requirement for Scope 1 and 2 was 306.7 gigawatt-hours (GWh) in 2022, which is lower than in the previous year (331.3 GWh). This goes to show the success of our energy-saving measures, both in terms of our climate strategy and as a result of the requirements stipulated in the Energy Security of Supply Ordinance, which became effective in Germany in 2022. Our **energy demand for Scope 1 (direct energy consumption)** was also lower than in the previous year. Scope 1 primarily concerns the energy sources natural gas and kerosene. Natural gas is used primarily for heating, in production and, to a lesser extent, for test stand operation. Kerosene is used as a fuel for testing engines on the test stand, so consumption depends on how extensive the tests are, the number of test runs and on engine size. MTU has no direct influence on the type and duration of test runs. All newly maintained or manufactured engines must complete a test run prior to delivery for safety reasons and to demonstrate their performance. The use of simulations in development and manufacturing reduces the amount of development testing for new engines. We are able to run our test stands in Hannover on [sustainable aviation fuels \(SAFs\)](#), and in 2022 we carried out initial test runs of customer engines with alternative aviation fuels at MTU Maintenance.

SUSTAINABLE AVIATION FUELS



→ [To the press release](#)

Together with LATAM, Latin America's biggest airline, MTU Maintenance used sustainable aviation fuels (SAFs) in test runs on the test stand at the MTU site in Hannover.

In 2022, we procured a total of 136.0 GWh (2021: 130.1 GWh) of **external energy (Scope 2)**. This increase is largely due to the Munich site's higher electricity consumption caused by a failure of the cogeneration plant that lasted some time. Electricity is a major energy source for us. It accounts for 42.2% of our total energy consumption (externally sourced electricity only). This electricity is drawn from renewable sources in varying proportions. At the site in Poland, for example, it was completely emissions-free. MTU Maintenance Canada gets a large portion of its electricity from hydroelectric power stations, which are a renewable resource. As part of our ecoRoadmap, in the future we aim to successively increase the purchase of green electricity generated exclusively from renewable sources.

**Energy consumption
Scope 1 and 2 (in GWh)**
GRI 302-1

	2022	2021	2020
Total	306.7	331.3	307.5
Direct energy consumption, natural gas, kerosene, mobility = Scope 1	170.7	201.2	191.5
Indirect energy consumption, electricity, district heating = Scope 2	136.0	130.1	116.0

The energy consumption of fuels for mobility excludes the site in Canada. Energy consumption other than that shown in the table (e.g. other fuels) is not reported, as its contribution to total Group consumption is immaterial. Energy consumption from externally outsourced test runs of engines and industrial gas turbines is not included. We have corrected the calorific value for natural gas, resulting in an adjusted presentation of energy data for previous years compared to previously reported values.

Electromobility at MTU



Fleet and company cars: In Germany, we have a total of 31 all-electric and 44 plug-in hybrid vehicles in use, representing 40% of the whole fleet. We expect to be able to increase this proportion to around 47% in 2023. A further increase continues to be dependent on delivery conditions. In addition, we have installed 20 regular charging stations, including eight in employee parking lots. We are planning to further expand charging capacity as demand grows.

Job tickets: We promote sustainable commuting practices among our workforce, through a special discounted “job ticket” for the local public transportation network or web portals for carpooling.

Our carbon footprint for 2022

In the reporting year, MTU generated 47,600 metric tons of CO₂e emissions at its production sites throughout the Group from its use of major energy sources (2021: 54,800 metric tons). This means we achieved a reduction of 13% compared to the previous year and a decrease in CO₂ emissions for both Scope 1 and 2. We were able to bring about these reductions primarily through our climate strategy.

CO₂ emissions (in t CO₂e equivalents)

Scope 1 and 2

[GRI 305-1](#), [305-2](#)

	2022	2021	2020
Total	47,600	54,800	83,200
Scope 1	38,000	44,400	42,200
Scope 2	9,600	10,400	41,000

MTU's Scope 1 CO₂e emissions result from consumption of the direct energy sources kerosene, natural gas and fuels for mobility. Meanwhile, MTU's Scope 2 CO₂e emissions result from the consumption of bought-in energy (electricity and district heating). The calculation of Scope 2 emissions uses emission factors from energy suppliers (market-based method). Other sources of CO₂e such as refrigerants or other fuels are not reported as their contribution to Group emissions is immaterial.

Consumption in Canada is included, but without mobility data. CO₂e resulting from externally outsourced engine and industrial gas turbine test runs and the combustion of sustainable aviation fuels during engine test runs in Hannover is not included in the balance sheet. We have corrected the calorific value for natural gas and the emissions factor for electricity at Rzeszów site (conversion to market-based), resulting in an adjusted presentation of emissions data for previous years compared to previously reported values.

MTU compensated the remaining Scope 1 and 2 CO₂e emissions for operations at Munich by means of high-quality offsets, such that this site achieved net-zero status in 2022.

CO₂ reduction is an important ESG goal

Due to the high priority of climate action at MTU, the reduction of carbon emissions is an important environmental, social and governance (ESG) goal. CO₂ is an ESG-relevant KPI that factors into the variable compensation of the Executive Board and senior managers. Our goal attainment is based on the Europe-wide climate action strategy for emissions generated by the European production sites (Munich, Hannover, Ludwigsfelde and Rzeszów). It is measured in terms of residual CO₂ emissions as “maximum residual CO₂ emissions” (based on current emission factors) and in terms of “CO₂ savings through sustainable measures” (based on 2019 emission factors) compared to the base year 2019. A twelve-month period that deviates from the reporting year is considered the performance period for this purpose (Dec. 1, 2021 to Nov. 30, 2022). At 44,000 metric tons of CO₂, the result was below the target value of 54,000 metric tons due to systematic CO₂ reduction and the purchase of green electricity. The savings target for sustainable measures was also reached (2,000 metric tons; target value: 1,750 metric tons).



To make our company's climate impact still more transparent, we take part in the annual assessment by the international non-profit organization [CDP](#), which collects data on companies' greenhouse gas emissions, climate risks and climate strategies on an annual basis. For 2022, we achieved a rating of B on a scale from D- to A+.

First Scope 3 carbon footprint in preparation

CO₂ emissions that do not result from energy use in site operations on MTU's part fall under Scope 3. This includes upstream value creation (suppliers), downstream product use and employees' commute to and from MTU. The plan to determine the Scope 3 carbon footprint is now part of our sustainability strategy. We aim to record and evaluate significant upstream and downstream activities and to establish an appropriate management system at the fully consolidated sites. [Scope 3 emissions from business travel in the Notes](#)

MTU's reforestation projects



CO₂ STORAGE



4,136 t

This is how much CO₂ storage we have already created through reforestation in domestic forests. (As of April 2022)

In addition to our high-quality offsets for residual emissions at the Munich site, we run reforestation projects together with our partner Deutim to create a regional CO₂ reservoir. The Forest Day for MTU employees is also part of this voluntary commitment. We will pursue reforestation in Bavaria together with Deutim until 2025 and thus create climate-stable mixed forests for future generations.

The following reforestation projects have already been realized:



Services & tools

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GRI: 102-3, 103-2, 103-3, 302-1, 302-4, 302-5, 305-1, 305-2, 305-3, 305-5

UNGC: 7-9

A RESPONSIBLE RAW MATERIAL ECONOMY

Conservation of resources

For us, conservation of resources means the responsible use of primary resources, improved material efficiency, and the careful handling of water. This is in addition to waste management and recycling.



Valuable waste: MTU takes great care to separate metals by type. In this way, high-value chips can be returned to the cycle.



MTU is reliant upon raw materials for manufacturing and maintenance at its facilities. [In addition to the use of renewable and non-renewable energy](#), there is also the use of water and the consumption of various materials. Our environmental management system controls our demand for and use of raw materials with the aim of obtaining high levels of efficiency in manufacturing and maintenance. This means low resource consumption and a circular approach for products and processes insofar as possible. We have set out the responsible use of resources as a guideline for all employees in our [Code of Conduct](#) and our MTU Principles. Our demand for raw materials depends fundamentally on batch sizes in production and maintenance.

Water management

We use water responsibly as a natural resource, and we have set up a local water management system for water protection at the production sites. In keeping with the precautionary principle, we treat wastewater properly and in accordance with the applicable legal requirements. MTU's water consumption depends on the production volume. Goals for the protection of this resource have been formulated at the local level.

Our fully consolidated production sites are situated in Germany, Poland and Canada, none of which are water-stressed regions as determined by the [World Resources Institute's Aqueduct Water Risk Atlas](#) (water risk for those countries: low or low/medium). Water-stressed regions are regions in which water is a scarce resource. We monitor the development of water availability in the regions in which we operate, which allows us to make decisions about additional measures to take, if required.

Our water consumption

We use drinking water for production and maintenance processes, in sanitary facilities and in the cafeteria. In addition, we use well water for cooling processes in machinery. Total water withdrawal in the reporting year amounted to around 8.5 million m³ (2021: 8.1 million m³). At the Munich site, we use large amounts of Quaternary groundwater from our own wells for cooling. In other words, the water used by the MTU Group in 2022 was 97.9% groundwater and only 2.1% came from the municipal drinking water supply. Using well water contributes to environmental protection and climate action, as it eliminates the need for energy-intensive cooling processes such as compressor cooling systems. MTU is required by the authorities to constantly release a small amount of well water into the Schwabenbächl river near the site. This water is regularly tested for pollution to ensure stable conditions for the river's wildlife.

We use recirculated water as much as possible in chemical process baths for applying protective coatings to blades and also for the process water in installations for testing component damage. Thanks to this recirculation, we have to treat only a small amount of wastewater before discharging it into the municipal sewers. At the Munich site, for example, we were able to save around 678,700 m³ of water. We also use recycled water for the chemical cleaning of engine parts. Our sustainable water management also includes systematic inspection and renovation of the well water and sewer networks.

Water withdrawal (in 1,000 m³)
GRI 303-3

		2022	2021	2020
	Total	8,538.5	8,079.6	8,327.3
Withdrawal	Municipal water	183.4	159.9	175.0
	Groundwater	8,355.1	7,919.7	8,152.3

No water withdrawal in water-stressed regions, figures on water discharge and consumption according to GRI 303-4 and 303-5 in the Notes.

Water quality

We treat wastewater in suitable sewage systems according to the type and extent of pollution. After treatment, the quality of the discharged wastewater complies with the official requirements for the respective sites. We carry out strict monitoring at the sites to ensure that legal limits are observed and comply 100% with all local authority requirements. Neither water sources nor water surfaces were negatively impacted or polluted by our operating activities. This applies in particular to our location in Canada, which is situated in direct proximity to the ocean.

Resource conservation campaigns

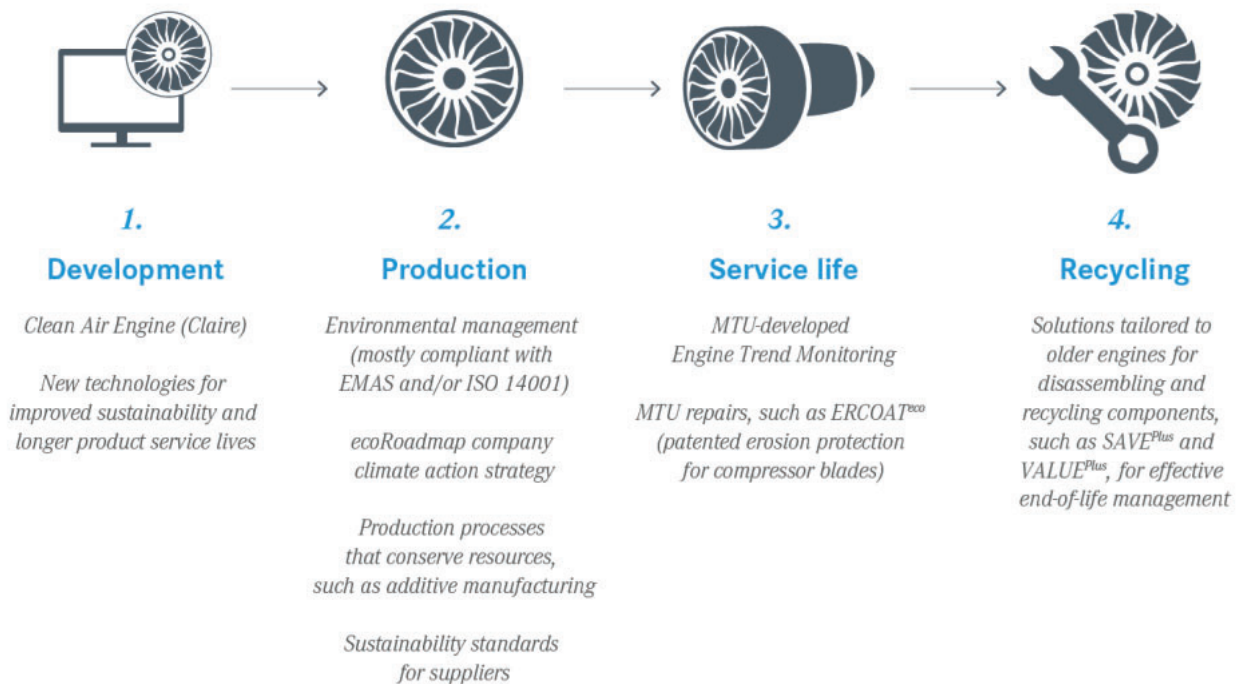


MTU Aero Engines Polska's Eco Facility team organized a cleaning campaign in a nearby forest for Earth Day and collected around 520 kilograms of garbage (left). At MTU Maintenance Canada, a team took action and collected garbage at Centennial Beach.

Circular economy

What we mean by circular economy is a lifecycle approach for our products that takes into account all phases of an engine, including the design of products and processes according to closed-loop principles. This includes the responsible use of primary resources, improved material efficiency and the use of secondary materials without impairing the quality or safety of our products. And responsible waste management and recycling are also part of the MTU approach. In addition, we are working on extending the service life of products; and we can prevent the use of new parts by means of customized repairs in particular.

Sustainability over the lifecycle of an engine



Engine materials such as titanium, nickel and alloying elements such as platinum or rhenium are of high value, and this explains why aircraft engines have very high recycling rates. As a vendor, we have no direct influence over the scrapping of engines, which is carried out by specialist companies.

Product development and design

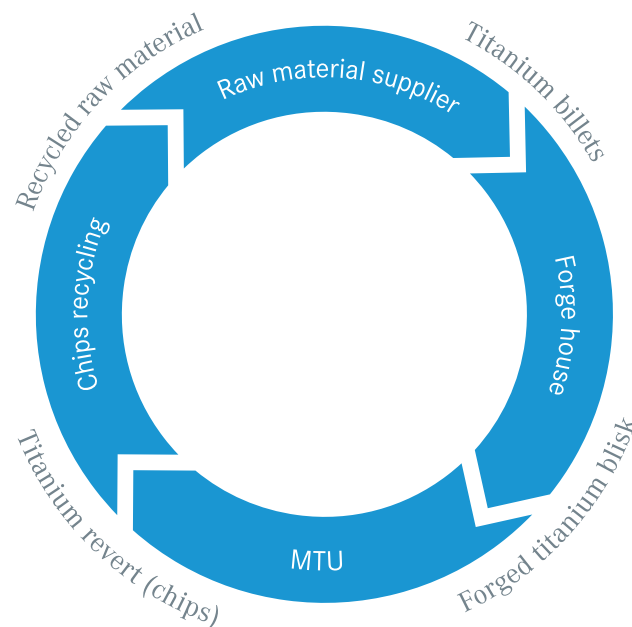
In product development, designs must comply with all safety requirements and aim to create highly robust engines with a long service life. As a rule, aircraft engines spend 30 years in service before they are decommissioned. And since climate impact and energy consumption are a focus of product design, conserving resources is an integral part of the products' lifecycle. In addition, designs ensure that the product can undergo multiple repairs throughout its service life, as repairing existing parts conserves more energy and resources than fitting new ones. At the end of an engine's lifecycle, the metallic properties of all its constituent materials (e.g. titanium, nickel) means that they are almost entirely recyclable.

Use of materials in production and maintenance

The long service life of our products and the continuous improvement of our maintenance processes ensure our demand for raw materials is reduced. In all of our production methods, we pay attention to efficiency in the use of materials and seek to avoid waste. We develop our own production and repair methods that are characterized by their high material efficiency. The use of new repair techniques and targeted maintenance programs increases the service life of engines.

Circular economy: The example of titanium chips

Sustainable process for high-quality titanium



We return chips from alloys to the supply chain, building a sustainable path to supply security, contribute to the careful use of resources and can reduce CO₂ emissions in the value-added process through recycled raw materials.

We achieve greater material efficiency in the production of new parts through the use of additive processes such as the 3D printing of metals. This manufacturing technology enables the rapid 3D production of highly complex components and allows for more freedom in designing them. Components are laser-melted directly from a powder bed according to CAD data—with just 5–10% of the powder ending up as excess material that cannot be used. We plan to employ this particularly resource-conserving method more and more as time goes on.

Our area of expertise: Engine repairs

With its “repair beats replacement” philosophy, MTU Maintenance achieves a truly impressive depth in aircraft engine repair. Using special techniques we have developed in-house, we repair engine components that in other maintenance shops would have to be replaced with new parts. For example, we manage to give around 70% of all engine blades a second, third or even fourth lease on life. We are gradually expanding this product recycling approach to include new processes with an eye to achieving even longer service lives and thus greater material efficiency. For instance, in the case of life-limited parts, we have succeeded in repairing integrally manufactured engine blades and disks, known as “blisks.” This is important because the number of blisks being installed in engines is increasing. MTU is one of the world’s leading companies in the field of blisk production and repair. On top of that, efficient and eco-friendly processes are used for repairs. One example is the use of water jets to remove coatings from components, which avoids the need for environmentally harmful chemical processes.

In addition, we offer repairs and various other measures to improve the operating behavior of components and engines. Special coatings in particular are able to increase the performance capability and durability of components, while targeted individual repairs of components can also help lower engine emissions and improve operating behavior.

Repairs to engine components not only avoid the energy- and resource-intensive manufacture of spare parts, but also offer further opportunities in the context of the circular economy for the usage and recycling phase—for example, through the targeted use of customized repair scopes, components can be repaired not just once but multiple times.

We collect all metal parts and components for targeted recycling, especially the highly valuable materials nickel, titanium and rhenium.

Material consumption in 2022

Our material consumption mostly occurs in production. The value our plants add depends on production materials (alloys, spray powder) as well as on consumables and supplies. In 2022, our total material consumption amounted to 8,740 metric tons, of which about 10% came from renewable materials.

Material consumption (in metric tons)

GRI 301-1

	2022	2021	2020
Total	8,740	8,230	7,380
Production material	3,690	2,840	3,350
Consumables and supplies	4,200	3,770	3,510
Other materials	850	1,620	520

Externally sourced material for production sites; production material comprises titanium and nickel alloys and spray powder; consumables and supplies include oils, cooling lubricants, chemicals, lubricants, gases and kerosene and diesel used as fuel; the other material comprises paper, cardboard packaging and wooden pallets and boxes. For engine parts, MTU uses returnable packaging that can be reused several times.

Our products require the use of materials that are classified as conflict minerals due to their possible origin in Central Africa and can be problematic with regard to human rights violations. As we do not procure these mineral raw materials directly, we have implemented appropriate processes in our supplier management in order to comply with our human rights due diligence. → [More information about human rights in the supply chain](#)

Chemicals according to the REACh regulation

Wherever possible, we avoid using materials that are hazardous to the environment or to human health in our manufacturing processes and products. According to the European REACh (Registration, Evaluation, Authorisation and Restriction of Chemicals) regulation, certain substances of very high concern (SVHCs) containing chromium(VI) are subject to authorization. We implement all provisions of the EU regulation for protecting employees and the environment. We use REACh-listed materials chromium trioxide at our Munich site e.g. for wear and corrosion protection. The European Chemicals Agency ECHA authorized MTU to continue its use in several of our processes until 2029 on the basis of the extremely safe workplace standards in our surface coating activities. At the same time, we are pushing ahead with the long-term elimination of SVHCs that require authorization. Through technology projects, we are searching for substitutes for chromic acid / chromium(VI). We oblige our suppliers to comply with the EU's legal requirements (registration, authorization, etc.) via our General Terms and Conditions of Purchase if they use REACh substances in their auxiliary or operating materials.

Our waste management

MTU practices sustainable waste management with the safe disposal of waste sorted according to waste type and recycling process. First and foremost, we try to avoid waste, reuse leftover materials and use waste either for its materials or as energy; if recycling is not possible, waste is disposed of properly. In this way, we seek to minimize material consumption and waste disposal volumes, as well as achieving high recycling rates.

BACK INTO CIRCULATION



71.5%

We were also able to recycle a large proportion of our Group-wide waste in 2022.

Total waste generation in 2022 rose to 7,950 metric tons due to capacity utilization (2021: 6,800). The proportion of hazardous waste was 43% (2021: 40.5%). Measured against that total, the MTU Group achieved an overall recycling rate of 71.5%. The amount of waste produced and of recyclables utilized depend primarily on production capacity utilization.

Waste footprint (in metric tons)

GRI 306-3, 306-4, 306-5

	2022	2021	2020
Total waste	7,950	6,800	7,040
Recycled	5,680	5,310	5,440
Disposed of	2,270	1,490	1,600
Share of hazardous waste	3,420	2,760	2,790
Recycled	1,300	1,380	1,370
Disposed of	2,120	1,380	1,420

Excludes construction waste

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GRI: [103-2](#), [103-3](#), [301-1](#), [301-2](#), [301-3](#), [303-1](#), [303-2](#), [303-3](#), [303-4](#), [303-5](#), [306-2](#), [306-3](#)

UNGC: [7](#), [8](#)

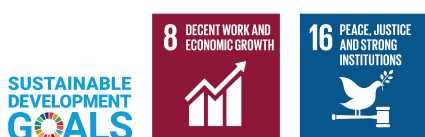
STANDARDS OF ECOLOGICAL & SOCIAL RESPONSIBILITY IN PROCUREMENT

Supplier management

We work with numerous suppliers around the globe. As a basis for this collaboration, we hold them to the environmental and social criteria that are important to us.



We procure components, goods and services for our production and maintenance activities from suppliers based all over the world. This upstream value creation is part of our sustainability management.



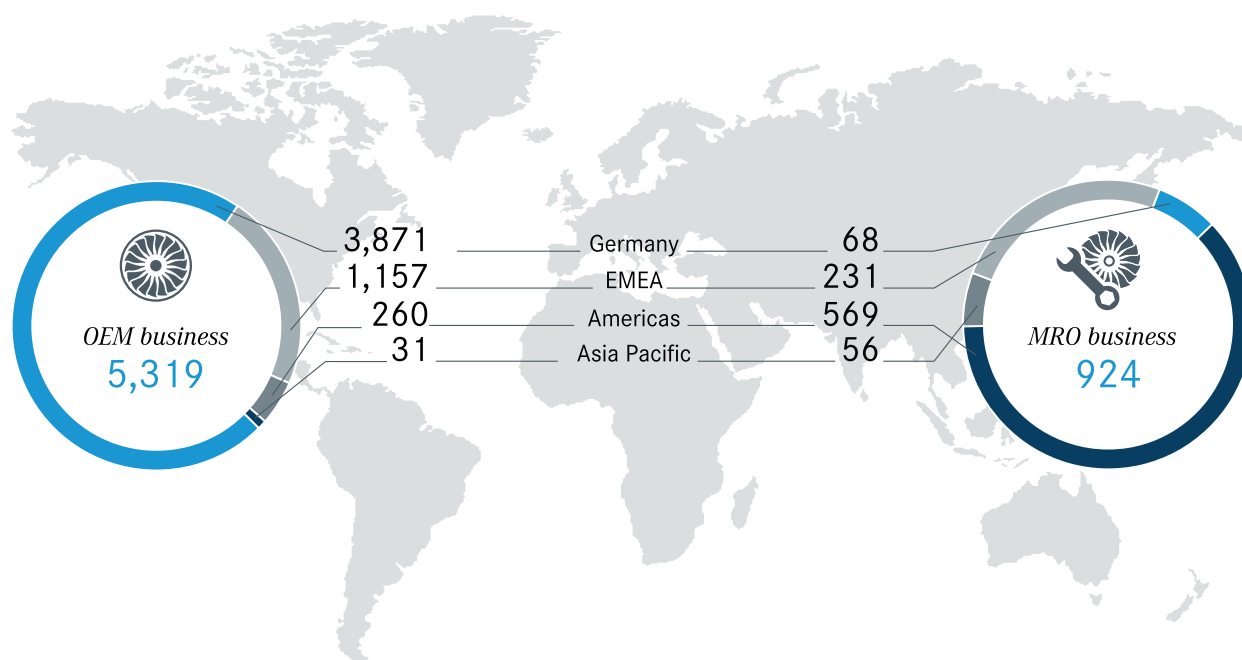
The value added by an MTU product includes important pre-production stages at external suppliers. We seek to create reliable relationships with those suppliers based on mutual trust. In keeping with our claim of sustainable value creation and the expectations of our stakeholders, we uphold certain standards in purchasing. For us, the pursuit of sustainable supplier management (responsible sourcing) encompasses environmental and social aspects as well as transparency along the supply chain. Key sustainability requirements are mandatory for suppliers. We place the same standards as regards sustainability on the collaboration with our suppliers that we do on our own business activities. To a large extent, the same standards apply to both of MTU's business segments: new and spare parts (original equipment manufacturer: OEM) and commercial maintenance (maintenance, repair and overhaul: MRO). However, they each have their own organizational units for sourcing production material.

Because today's supply chains are so global, extensive and complex, we concentrate our efforts regarding sustainability aspects on the supply step immediately upstream (tier 1). However, our direct suppliers are contractually obliged to ensure that their subcontractors also abide by our defined standards.

Our supplier base

In 2022, our sites worked with 6,243 suppliers around the world (2021: 5,897). Our supplier base expanded due to growth in the OEM business. Europe is home to 85.3% of the suppliers, with 63.1% of the total number of suppliers located in Germany.

MTU suppliers 2022 by region

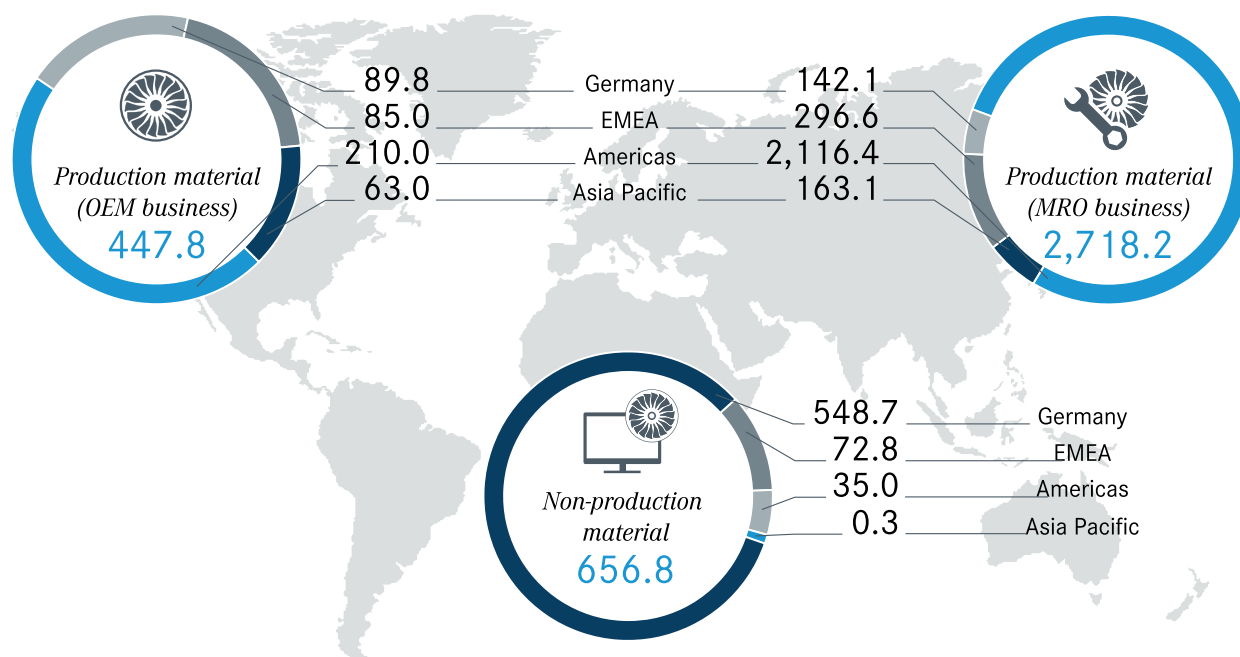


GRI 102-9: Supplier base for production material and non-production material for OEM (new and spare parts) and MRO (commercial maintenance) segments: EMEA = Europe (excluding Germany), the Middle East and Africa; Americas = North, Central and South America plus the Caribbean; Asia Pacific = East Asia, Southeast Asia, Australia and Oceania; excluding MTU Maintenance Serbia (operations started end of 2022)

Purchasing volume

Purchasing volume totaled some EUR 448 million for production materials in the OEM business. Due to production activities, this was above the level in 2021 (EUR 325.5 million). In the MRO business, too, capacity utilization pushed up the purchasing volume for production materials year over year to a total of EUR 2.7 billion (2021: EUR 2.0 billion). Non-production material expenses amounted to EUR 656.8 million for the OEM and MRO business (2021: EUR 659.5 million). By and large, we were able to source production and non-production material for the OEM business at our own discretion. By contrast, MRO purchasing volume for spare parts and repair work is subject to strict requirements imposed by the relevant OEMs. As a result, MTU Maintenance has less room for maneuver in selecting suppliers. The sole exception is MTU Maintenance Lease Services (MLS) in Amsterdam.

Purchasing volume 2022 by region (in EUR m)



GRI 102-9: Purchasing volume for OEM (new and spare parts) and MRO (commercial maintenance) segments. EMEA = Europe (excluding Germany), the Middle East and Africa; Americas = North, Central and South America plus the Caribbean; Asia Pacific = East Asia, Southeast Asia, Australia and Oceania; production materials excluding MTU Maintenance Serbia, non-production materials excluding MTU Maintenance Canada

Measured by purchasing volume, the Western Europe and North American markets, which are so important generally for the aviation industry, account for the lion's share of MTU's procurement. In the business for new and spare parts, we procure across the entire breadth of the supply chain, from blanks to finished parts. We always source castings and forgings externally, and the same goes for special materials for which MTU has not built up manufacturing expertise, such as electronic control systems. If possible, we source our supplies directly from the manufacturers of blanks or finished parts, whereby the company procures raw materials itself only to a small extent → [More information about the measures we take regarding conflict minerals in raw material purchasing](#). For commercial engine modules, the average proportion of sourced parts lies between 48% for Poland and 68% for Germany (in the military sector, the figure is some 60%).

Local value creation is particularly important when purchasing non-production material and services, as is the wide variety of goods and services. We procure many of our non-production materials in the countries in which we operate. The local proportion of the purchasing budget for non-production material, for instance, was 86% in Germany and 60% in Poland.

Sustainable standards in procurement

We have established a binding [Code of Conduct for Suppliers](#) that is a fixed component of the contracts. The Code of Conduct is informed by the [ten principles of the UN Global Compact](#) and sets out social and environmental standards, respect for human rights and integrity in business conduct with a ban on corruption and bribery. Each contract signed by a supplier includes the commitment to abide by these principles and to communicate them to subcontractors. The Code of Conduct applies to suppliers of the European production sites including MTU Maintenance Serbia and of MTU Maintenance Canada and MTU Aero Engines North America, meaning it covers 93.2% of the entire purchasing volume for 2022. MTU rolled out a new Code of Conduct in 2023, which imposes more stringent requirements on suppliers with regard to human rights issues. [For more information, see Human rights in the supply chain](#)

Moreover, MTU's General Terms and Conditions of Purchase also contain environmental, social and compliance stipulations. In our General Terms and Conditions of Purchase for our European sites, we also insist on compliance with the EU's REACH chemicals regulation.

Focus on human rights

When managing our suppliers, we place a particularly strong focus on safeguarding the respect of human rights. Our approach and measures, and how they have developed, are presented in detail under → [Human rights and conflict minerals in the supply chain](#).

No violations of the Code of Conduct

Suspicious that the Code of Conduct for Suppliers may have been breached can be reported confidentially to MTU's Compliance Officer. Reports can also be submitted anonymously via the [iTrust system](#), which is available in several languages. Should a supplier be implicated in charges of corruption, extortion, the granting of undue advantage or the use of child labor in the execution of a contract for MTU, the collaboration agreement will be terminated without prior notice. If other principles of the Code are violated, the supplier must demonstrate that suitable corrective measures have been initiated and implemented and must guarantee this in writing. MTU reserves the right to carry out on-site audits to verify compliance with the Code of Conduct. No accusations of possible breaches of the Code of Conduct were reported or registered during the period under review. Nor were there any complaints about suppliers. Therefore, as in previous years, no supplier partnership was terminated because of sustainability violations, confirmed cases of corruption or other complaints. This also applies to human rights aspects → [Human rights in the supply chain](#).

Risk management and assessment

We believe partnerships based on trust are key to sustainable supplier management. For this reason, we seek out long-term relationships with our suppliers. In the OEM business unit for aircraft engines, for example, a large proportion of the materials and services is based on contracts with a typical term of two or more years. Contractually agreed buffer inventories allow us to respond quickly to fluctuations in demand. In the reporting year, MTU worked with 1,388 new suppliers (2021: 938), or 22.2% of the total (2021: 15.9%). All suppliers are vetted before being accepted into MTU's supply chain. This process includes a binding supplier disclosure and contractual undertaking to comply with the Code of Conduct. MTU's engine leasing business, Amsterdam-based MLS, has its own separate but similar process. To cover environmental aspects, we request proof of certification to standards such as ISO 14001. Using periodic evaluations, we regularly review existing suppliers, including with respect to their ISO 14001 certification. Once approved, suppliers must regularly demonstrate their ISO 9001 compliance for quality management via re-certifications. In connection with the establishment of the new MTU site in Serbia, a process was defined for screening new suppliers there with regard to corruption risks. Reviews during the reporting period did not reveal any indications of corrupting behavior. We present our analysis of risks relating to human rights in the supply chain in this report under → [Human rights in the supply chain](#).

We will intensify our assessment and review of suppliers with regard to sustainability requirements. As part of an in-house project, we have set up suitable measures and an IT tool for the ESG assessment of suppliers (ESG = environmental, social, governance).

To raise awareness of sustainability standards in the supply chain, we regularly provide purchasers with training on professional compliance matters and on the [MTU Code of Conduct](#), which applies to all the company's employees and prohibits corruption, bribery, the granting of undue advantage, and anti-competitive behavior. Our purchasers are also trained on the Code of Conduct for Suppliers. In addition, we offer special corporate responsibility training, including bespoke training for purchasing departments.

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GRI: [102-9](#), [102-10](#), [103-2](#), [103-3](#), [204-1](#), [205-3](#), [308-1](#), [308-2](#), [407-1](#), [408-1](#), [409-1](#), [412-3](#), [414-1](#), [414-2](#)

UNGC: [1-5](#), [8](#)

DOING OUR DUE DILIGENCE

Human rights in the supply chain

We respect human rights and are committed to seeing that they are also upheld in upstream value creation activities. Our aim is to prevent the violation of human rights in the supply chain.



We are conscious of our responsibility as a company with global operations, and aim to carry out our due diligence with regard to human rights. As a signatory of the UN Global Compact, MTU fully respects the internationally proclaimed human rights set out in the United Nations' Universal Declaration of Human Rights and applies that to the supply chain as well. In particular, we pursue the goal of preventing human rights violations that could affect employees (zero-tolerance principle). [Read more at Employees](#) MTU also expects its suppliers to uphold human rights and create fair working conditions.

Code of Conduct for Suppliers

The Code of Conduct for Suppliers applies to upstream value creation activities. Our suppliers must commit to compliance with the Code of Conduct, which is based on the [ten principles of the UN Global Compact](#), which in turn are derived from international initiatives and conventions for the protection of human rights. The Code of Conduct requires suppliers to observe and uphold human rights and to ensure that they are not complicit in any human rights violations. That includes compliance with labor standards regarding the freedom of association, the right to collective bargaining, the prohibition of forced and child labor, the equality of remuneration regardless of gender, and equal treatment of employees. And finally, we require our suppliers to apply the Code to their subcontractors and reserve the right to terminate any contract with a supplier using child labor to manufacture products supplied to MTU, without prior notice. → [MTU's Code of Conduct for Suppliers](#)

Established reporting procedures are in place to ensure that we can systematically follow up on all complaints or reports of human rights infringements. Employees and external stakeholders can make reports to the Compliance Officer as a confidential contact point in the Group, or anonymously via the web-based [iTrust reporting system](#), available in multiple languages. This applies to all human rights concerns. → [See Compliance for information about handling reports](#)

In the reporting period, no reports of suppliers violating the Code of Conduct regarding human rights were submitted. Furthermore, no supplier relationships were terminated due to sustainability shortcomings with regard to human rights.

New Code of Conduct rolled out starting in 2023

Germany's Act on Corporate Due Diligence Obligations in Supply Chains (LkSG) took effect for MTU Aero Engines AG in 2023. In the reporting year, an interdisciplinary project team prepared the implementation of the specifications. In the course of this, MTU's revised Code of Conduct for Suppliers has been in force starting in 2023. On the topic of human rights, this also formulates requirements for appropriate payment, occupational health and safety, and environment-related topics such as the handling of hazardous substances and waste, as well as expectations regarding environmental protection and climate action.

Risk analysis and monitoring of sustainability performance

We regularly conduct a risk analysis of suppliers to the sites in Germany, Poland and Canada as well as the MTU Aero Engines North America subsidiary. The risk analysis takes into account MTU-specific product groups and the countries they are sourced from. It incorporates the findings of the [Global Slavery Index compiled by the Walk Free Foundation](#), which evaluates countries regarding forced and child labor and legal frameworks, among others. This risk analysis is integrated into the existing risk process for suppliers. In the next step, we plan to audit key suppliers to check their compliance with sustainability criteria. To this end, MTU implemented an ESG (environmental, social, governance) assessment tool and began rolling it out. A pilot for OEM suppliers on sustainability performance monitoring was launched. MRO also conducts a supplier evaluation twice a year for suppliers of the German sites.

Throughout this process, we again in 2022 identified no supplier that poses a significant risk as regards child, forced or compulsory labor, or at which the freedom of association or right to collective bargaining could be compromised.

Conflict minerals: Transparency about raw materials used

We take various steps to safeguard the respect of human rights in the supply chain. This applies especially to the procurement of certain raw materials known as conflict minerals: for example, tantalum, tin, tungsten and gold, which can be found in some of our engine components. These minerals can cause problems in procurement because they are sometimes mined in Central African countries, where the profits are used to finance armed conflicts that commit human rights violations. MTU strives for a sustainable and transparent value chain that excludes the use of conflict minerals. The company never deliberately purchases conflict minerals, but they can find their way into production or pre-production at the various levels of the global supply chain. According to the provisions of the Dodd-Frank Act applicable to companies listed on stock exchanges in the United States, our American partners and customers require that we disclose the origin of minerals used in our components and limit our sources to certified mining companies and primary-alloy producers ([Conformant smelter and refiner lists](#)). In turn, MTU demands that its relevant suppliers should specify the origin of such minerals, in order to ensure that the value chain contains only conflict-free raw materials. The general terms and conditions and contract provisions require suppliers to provide information about the source of minerals in accordance with the EICC/GeSi Conflict Minerals Reporting Template.

When MTU requested information from suppliers in 2022, it discovered nothing to indicate that MTU components contain conflict minerals.

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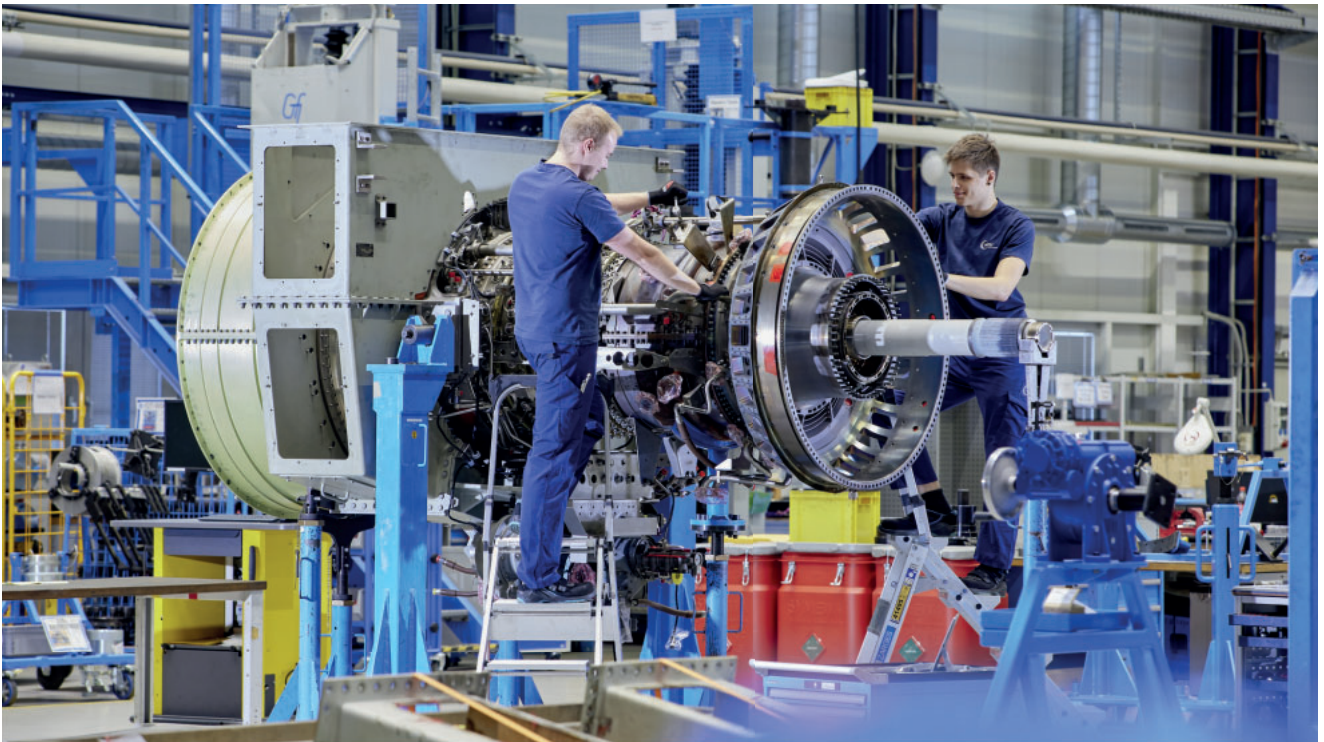
UNGC: 1-6

GRI: 103-2, 103-3, 407-1, 408-1, 409-1, 412-3, 414-1, 414-2

READY FOR THE FUTURE

Collaboration and leadership

Good collaboration and reliable leadership are important pillars of our success. We encourage the commitment of our employees and support our managers in exercising their responsibility. In this way, we strengthen cohesion within MTU.



Teamwork makes us more successful. And it flourishes in a working environment that inspires and connects people.



What makes us at MTU strong is not just our operational performance and high degree of financial stability, but the dependable nature of our collaboration and management. Trusting collaboration and a willingness to embrace change are the main drivers of an innovative, modern corporate culture. Further developing our corporate culture has been an overarching MTU goal since 2022 and is a defined part of our Innovative Culture project. To ensure our long-term success and innovative strength, we rely on a culture that is open to change in order to handle accelerated developments, such as digitalization, or pressing challenges, such as climate change, and to profitably seize the opportunities and potential that emerge from them. Forward-looking, intensive training of our workforce, the promotion of diversity, and a safe and inclusive working environment pave the way for each and every employee to develop to the best of their abilities and keep MTU on the path to success.

Fast Facts: #MTUfamily

A GLOBAL TEAM



11,273

employees helped MTU achieve success in 2022.

HIGH LEVEL OF CONFIDENCE



91 %

of employees firmly believe in MTU's future.

STRONG COHESION



5.8 %

turnover rate: Our specialists and managers stay on board.

Attractive and sustainable: MTU as employer

Responsibility for employment issues lies with the Executive Board. The CEO is also the Director of Labor Relations. MTU's human resources department sets policy in line with our corporate strategy. It also assists in efforts to achieve our long-term corporate and growth targets. The full Executive Board receives regular reports on human resources policy. Responsibility for successful implementation lies with local human resources departments and the respective technical departments and managers.

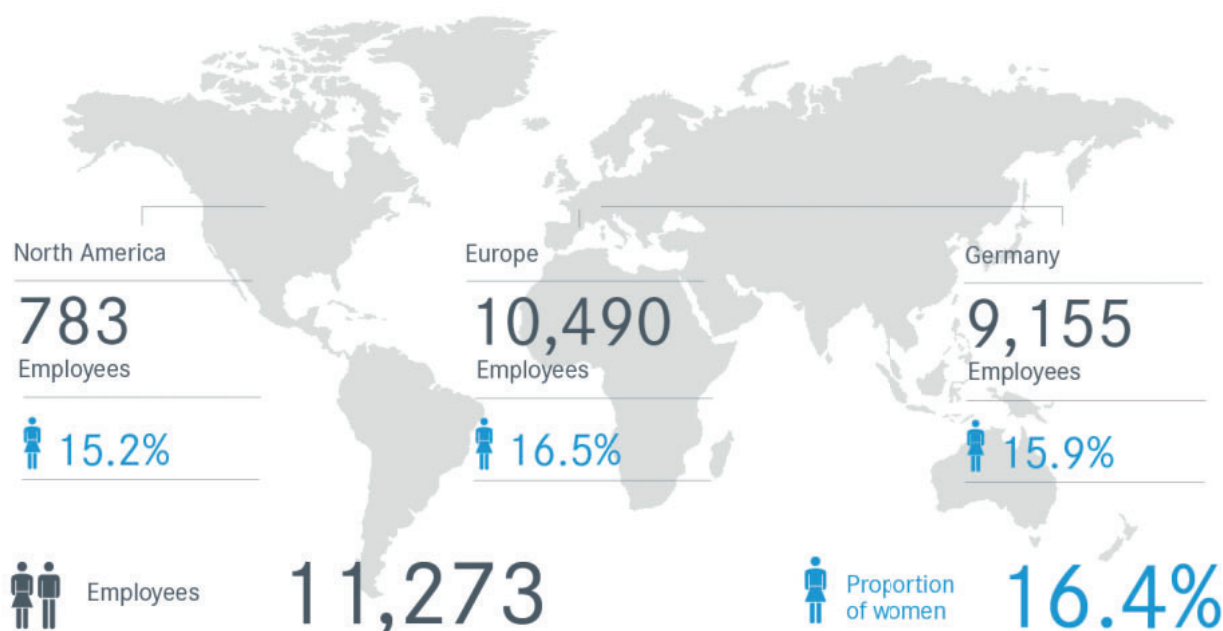
The aim of our HR strategy is to address relevant changes and developments in the world of work and position the company as an attractive and sustainable employer for existing and new employees alike. As a best-in-class employer, we create the conditions for profitable corporate growth, a pillar of MTU's strategy. In our case, that means we act in an employee-oriented manner with an increasingly diverse workforce, overcome increasing complexity with confidence, and are present on the German and international labor markets as an attractive employer.

MTU, get ready!

We are taking off for the future. As part of our Innovative Culture project to strengthen our corporate culture, in 2022 we established a maturity index for the first time. Based on a survey of employees in the defined focus areas of Innovative Culture, we identified specific points where we need to take action in the further development of our corporate culture. Our focus will be on the digital mindset and greater decision-making authority among employees ("empowered organization"). The index will be determined annually.

Our global MTU team

Employees by region



GRI 102-8: Total workforce of fully consolidated sites as at the end of 2022; proportion of female employees measured against active workforce. For composition of workforce sizes and scope of consolidation, see the [GRI Index](#).

At the end of 2022, our workforce comprised 11,273 employees at all fully consolidated sites, a further increase over the previous year (2021: 10,508). The increase is spread across all regions, but can be seen in particular at our sites in Munich, Germany; Rzeszów, Poland; and Nova Pazova, Serbia. At 93.1%, the majority of MTU's total workforce continued to be located in Europe, with a full 81.2% of the total workforce in Germany; 6.9% of the workforce was employed in North America. We are committed to long-term employment contracts, and the proportion of permanent employment contracts at MTU is traditionally very high. In the reporting year, it stood at 93.5% (2021: 93.7%).

The turnover rate is down again compared with the previous year. This is because turnover was higher last year, when we had to adjust our staff capacity in light of the economic crisis caused by the coronavirus pandemic. The degree of loyalty to our company remains high, with an average length of service of around 14.6 years (Germany, measured in terms of active workforce).

Staff turnover

GRI 401-1

	2022	2021	2020
No. of employees that left the company	540	609	385
Turnover rate (%)	5.8	6.8	4.2

Turnover rate measured as a proportion of core workforce, annual average, figures include retirements; data broken down by age group is not available. We report on new hires in the chapter on Diversity & inclusion. Figures on staff turnover by region in accordance with GRI are presented in the Notes.

Social and labor standards established

As an employer, we show responsibility toward our employees, protect their rights and requirements, and create long-term, secure employment on the basis of corporate social responsibility. Our social and labor standards are defined in a Group-wide Code of Conduct and incorporate:

- Observance of human rights
- Equality of opportunity in the workplace
- Dealings with suppliers, customers and business partners in industrial relations
- Collaboration with employee representatives and labor unions
- Entitlement to appropriate remuneration
- Occupational health and safety
- Employee training and development

→ [MTU Code of Conduct](#)

The reporting procedures in the event of suspected breaches of our Code of Conduct, statutory requirements, plus our internal company guidelines and our principle of zero tolerance are described under → [Compliance](#) and → [Human rights](#). Details of the anti-discrimination measures we take can be found under Human rights. As a signatory to the [UN Global Compact](#), we are committed to observing its principles of respect for human rights and equal treatment in the workplace. We are also committed to fair working conditions in accordance with the [International Labour Organization's \(ILO's\) core labor standards](#).

At the beginning of 2023, MTU adopted a [Policy Statement on the Protection of Human Rights](#). → [Human rights](#)

MTU protects employees' rights and safeguards their freedom of association through the Code of Conduct. When drafting employment contracts, we observe national statutory requirements, collective agreements such as collective bargaining agreements, as well as internal company agreements and notice periods as laid down by law. Managers ensure that company agreements are implemented and observed on a day-to-day basis in their areas of responsibility. In 2022, 91% of the people employed by the company in Germany were covered by collective agreements (e.g. collective bargaining agreements), a figure that stood at 77% worldwide in the same year.

The relationships we form with our employees are based on respect and trust and we take their concerns into account: in accordance with the German Works Constitution Act (Betriebsverfassungsgesetz), MTU's sites in Germany have works councils that maintain regular, open and trust-based dialogue with management. The German sites also have a Group works council that handles Group-related issues. At the company's sites in Poland and Canada, elected employee representatives support the interests of the workforce in dealings with management. In addition, the interests of employees are represented on the Supervisory Board, where seats are filled on the basis of parity.

Leadership and collaboration as a dialogue

The MTU leadership values (“We transform,” “We empower,” “We create trust”) form a shared basis for managers’ values and conduct and shape our leadership culture. They promote collaboration at all levels, provide orientation and formulate expectations for leadership behavior. We thoroughly prepare and train our managers for their tasks and constantly provide them with inspiration. [These offers are detailed under Employee development.](#)

GAUGING THE MOOD ON COMMITMENT AND LEADERSHIP



77%

In 2022, we achieved this index value for commitment and leadership in the two PulseCheck surveys. For 2023, we have revised our feedback landscape to include complementary tools.

We carry out an employee survey at regular intervals at all of our larger sites to provide important impetus for the company’s ongoing development. We see the results as an important yardstick for successful collaboration and leadership. We use the PulseChecks survey format at regular intervals to determine the current mood in the organization at the German sites. All employees are surveyed on various topics such as commitment, information, leadership, team, perspective and mobile working. The feedback on the topics of commitment and leadership is incorporated into an index value; this was taken into account as an ESG-relevant (ESG=environmental, social and governance) indicator for the variable compensation of Executive Board and executives in 2022. The index value includes the agree responses (“Agree fully” to “Agree somewhat”). The value from the two PulseChecks was around 77% of the responses and thus above the target of 75%. In addition, on average 91% of employees reported a high level of trust and confidence in MTU.

We also conduct regular surveys at our sites outside Germany, such as MTU Aero Engines Polska. Moreover, further employee involvement forums are established at our sites around the world. These range from works meetings in Germany and townhall meetings in the United States to special instruments. We have revised the feedback landscape, which from 2023 onward will consist of further building blocks in addition to the PulseCheck.

We use our idea management system to obtain and evaluate improvement suggestions from employees. In 2022, the participation rate was 24%. In addition, we regularly initiate in-house Ideation Challenges on predefined tasks in order to utilize the ideas of our employees. The ideas and concepts submitted are evaluated by a jury. We take particularly promising suggestions and test their potential and feasibility in projects in our [Inno Lab](#), an in-house MTU innovation hub.

We have established a consistent methodology for feedback and for evaluating performance at all levels of the hierarchy, from senior managers to employees included in collective bargaining agreements. The performance criteria are based on corporate, center or departmental objectives and are designed to measure how employees and managers contribute to reaching these objectives. Goal attainment is discussed during the year in milestone meetings and at year-end in goal attainment meetings. All managers undergo performance reviews to evaluate achievement of their personal targets, and in 2022, 94.4% of all MTU employees worldwide received a regular appraisal of their performance (at least once a year).

AWARD-WINNING EMPLOYER



→ [Overview of awards](#)

In comparative analyses with other companies, MTU again received several awards in 2022, including Top Employer in Germany and Top Employer in Poland as well as a commendation from the Women's Career Index.

Attractive compensation and benefits

For us, fair wages are part of an appreciative and respectful approach. Our employees' right to appropriate remuneration is enshrined as a pillar of MTU's Code of Conduct. Employee wages at all our sites are above the legally stipulated local minimum wage. We reexamine our remuneration structures regularly.

MTU ensures that employees receive competitive remuneration that reflects their performance, regardless of gender or other characteristics against which discrimination occurs. In addition to the Code of Conduct, this has been enshrined as an essential working condition in a Policy [Statement on the Protection of Human Rights](#) since 2023. The remuneration of pay-scale employees in Germany is based on collective bargaining agreements. Variable compensation for senior managers is tied to MTU's long-term performance.

We offer a broad range of additional perquisites. In addition to the statutory obligations, in Germany these include accident insurance, profit-sharing, family-related services, mobility benefits, a healthcare service and training opportunities. In addition to the employer's contributions, all employees can make a personal contribution to the company pension plan. At our international sites we offer a range of benefits such as private life insurance, health insurance and retirement planning support.

SOCIAL BENEFITS IN 2022



145 m euros

In addition to their salary, we offer our employees a wide range of social benefits such as a company pension scheme and support services.

We enable our employees to share in the company's success. Each site does this using different regulations and programs. For our German sites, we offer an annual employee share program (participation rate 2022: 42.6%), with which we also aim to strengthen the entrepreneurship of our employees and their loyalty to MTU. Some of our international sites offer their own long-term bonus schemes, as in Rzeszów (Poland), or award annual bonuses, as is the case in Vancouver (Canada).

Also in 2022, we restructured a social fund, originally established in connection with the Covid-19 pandemic. Since then, the funds have been donated to MTU employees who find themselves in financial difficulties through no fault of their own, and to humanitarian causes outside the company.

Alternative working arrangements (Germany)

GRI 102-8, 401-3

	2022	2021	2020
Part-time employees (in %)	8.1	7.4	7.6
Employees on parental leave	537	478	416

The right to parental leave in Germany is governed by the German Parental Allowances and Parental Leave Act, which applies to the entire workforce. The legislation stipulates that any employee has a right to time off—regardless of their gender. Given discrepancies between national legal considerations, we do not consider it useful to consolidate these figures at the Group level. Figures on part-time work and parental leave by gender in accordance with GRI are presented in [the Notes](#).

We recognize the specific needs and various life phases of our employees and offer various options for individuals to shape their working hours and how their work is organized. These include, for example, a range of part-time models, mobile working and sabbaticals. This way, we create attractive conditions at MTU and help our employees achieve a better work-life balance.

Offerings to promote work-life balance

- Flexible working hours and flextime accounts
- Wide variety of part-time working arrangements
- Educational leave
- Mobile working
- Teleworking
- Sabbaticals
- Part-time work for older employees
- Parental leave
- Job sharing
- Support for families (advice on arranging childcare, care services)
- Collectively agreed leave to look after children and relatives in need of care
- Collectively agreed time off for special personal occasions (e.g. wedding, change of residence, deaths in the family)

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GRI: 102-8, 102-12, 102-16, 102-41, 102-43, 103-2, 103-3, 201-3, 401-1, 401-2, 401-3, 404-3, 405-2

UNGC: 3, 6

DUTY OF CARE AS AN EMPLOYER

Human rights

We respect the human rights of our employees and have enshrined this in our company by means of various instruments. Beyond this commitment, we aim to prevent the violation of human rights at MTU.



MTU respects the internationally proclaimed human rights set out in the United Nations' Universal Declaration of Human Rights and enforces and protects these rights within its sphere of influence. Our [Code of Conduct](#) stresses that respect for human rights is an essential part of MTU's corporate social responsibility. We also respect and support the fundamental principles of the International Labour Organization ([Core labor standards of the International Labour Organization \(ILO\)](#)) and are a signatory to the [UN Global Compact](#), Principle 6 of which aims to uphold human rights.

We are conscious of our responsibility as a company with global operations, and aim to carry out our due diligence with regard to human rights. In particular, we pursue the goal of preventing human rights violations that could affect employees (zero-tolerance principle).

We view the respecting of human rights principles as a Group-wide issue that goes beyond social labor standards and basic labor rights for employees to include [sustainable supplier management](#) and trade compliance standards for [responsible international trade](#).

Code of Conduct addresses human rights

MTU sees it as its duty to respect the individuality and dignity of each and every person, maintain equality of opportunity in the workplace and prevent discrimination. The protection of human rights, the right to appropriate remuneration, as well as recognition of regulations governing employee and union representation under labor and works constitution law, are implemented Group-wide through the Code of Conduct. As an employer, we create fair working conditions based on legally binding employment contracts with appropriate remuneration. This includes the right to unionize and to adopt collective agreements. Our zero-tolerance approach to violations is also a fundamental component of our Code of Conduct.

Compliance with the Code of Conduct and ethical principles is enshrined in the MTU Principles. In addition, we comply with statutory requirements; in Germany, for example, MTU must honor the [General Act on Equal Treatment \(AGG\)](#). Also in Germany, we have worked with employee representatives to enact internal guidelines on fair and cooperative conduct that are designed to prevent bullying, sexual harassment and discrimination. They also stipulate a systematic process for handling complaints.

When they join the company, new employees are informed about the regulations laid down in the Code of Conduct and—in Germany—in the General Act on Equal Treatment (AGG), and they undertake to comply with these requirements. In addition, we provide regular training on the Code of Conduct at all company's sites and for all hierarchical levels. In 2021, we redesigned the training on the Code of Conduct and in the reporting year, we continued the e-learning program, in which 3,131 employees took part last year. → [More about MTU's Code of Conduct and associated training under Compliance](#)

Reporting channels for stakeholders

Reporting procedures have been established to ensure that we can systematically follow up on all complaints or reports of human rights infringements. Employees and external stakeholders can make reports to the Compliance Officer as a confidential contact point in the Group, or anonymously via the web-based [iTrust reporting system](#), available in multiple languages. This applies to all human rights concerns. → [See Compliance for information about handling reports](#)

In addition, points of contact for employees have been set up at each site, about which we provide information on-site. For example, in compliance with legal regulations such as the AGG in Germany, trained personnel at each site are identified as the contact points for complaints regarding discrimination. At MTU Maintenance Canada, employees can file a formal complaint with human resources management in cases of discrimination. They also have the right to go beyond the company and make a formal complaint to the BC Human Rights Tribunal. At MTU Aero Engines Polska, this function is carried out by a person elected by the employees. What's more, employees can also report grievances to managers, the works council or the head of human resources. The Executive Board is informed about infringements depending on the severity of their impact. In cases of substantiated complaints, we take appropriate action to find a solution. → [More information about the collaboration between management and the works council in the chapter Collaboration and leadership](#)

POSITIVE WORKING ENVIRONMENT



0 incidents or substantiated complaints regarding discrimination were recorded in 2022. We see this as a sign of good collaboration at MTU.

No site had an identified case of discrimination or received a substantiated complaint in 2022 as defined by the respective anti-discrimination legislation in effect there.

Human rights risk management revised

We strive to avoid negative impacts of our business activities on human rights as far as possible. We continuously review our business activities for human rights risks in order to define and implement preventive measures at an early stage. We classify human rights risks under various elements of the risk inventory of our corporate risk management process. Regarding its methodology, approach and assessment, our human rights risk analysis is based on MTU's corporate risk analysis.

MTU's own business activities are conducted mainly in Germany, the EU and North America. We assume a low probability of occurrence for significant violations of human rights in our own business area, as these regions have regulations set by the respective legislators and a commitment to human rights that is rooted in society. In addition, the aviation sector has its own specific regulations and regulatory oversight.

Accordingly, we have identified no MTU business location that we must consider at significant risk of child, forced or compulsory labor, or at which the freedom of association and right to collective bargaining could be compromised.

If we identify a violation of obligations relating to human rights, we will immediately take appropriate measures to end this violation, prevent it in the future or minimize its extent.

Policy Statement on the Protection of Human Rights adopted

Germany's Act on Corporate Due Diligence Obligations in Supply Chains (LkSG), which took effect there in 2023, calls for responsible management to protect human rights both internally and externally for the supply chain. In the reporting year, MTU prepared the implementation of the legal requirements.

At the beginning of 2023, the MTU Executive Board signed a [Policy Statement on the Protection of Human Rights](#) that applies to the entire MTU Group. This policy statement sets out MTU's understanding of human rights and responsibilities and underpins the company's zero-tolerance approach to violations.

Executive Board appoints Human Rights Officer

In response to this legislation, the Executive Board will also appoint a Human Rights Officer as a central function, who will start work in 2023. The Human Rights Officer monitors risk management for the protection of human rights and regularly reports to the Executive Board. In addition, the definition of human rights has been expanded to include aspects of environmental protection and climate action, as these can have an impact on human rights.

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GRI: [103-2](#), [103-3](#), [406-1](#), [407-1](#), [408-1](#), [409-1](#)

UNGC: [1-6](#)

ADEQUATELY PROTECTING EMPLOYEES

Occupational health and safety

At MTU, our employees should have a safe and healthy environment in which to work. This is in line with our social responsibility and is expressed in strict occupational safety standards, company health management and a preventive approach.



Personal protective equipment is important for occupational safety. This includes protective shoes, protective goggles and hearing protection, all provided by MTU.



MTU places great importance on the safety of its employees. Occupational safety and employee health are enshrined as one of the key principles of corporate social responsibility in MTU's [Group-wide Code of Conduct](#), which stipulates that workplaces must be set up in accordance with statutory and generally recognized occupational health and safety regulations. In addition, we have established an internal standard that lays down parameters, rules and KPI definitions applicable across all sites. A Group report on workplace accidents is submitted to the Executive Board each quarter. Our occupational safety approach is not centralized; local implementation addresses the requirements at each site. At the individual production sites, occupational safety is the responsibility of the site managers; responsibility for this lies with appointed managers. Local technical departments take action on occupational safety issues on-site and report regularly to their site management. The workforce at the company's production sites in Germany, Poland and Canada is represented in locally organized occupational safety committees, the composition of which includes employee representatives.

Occupational safety forms part of our [integrated management system \(IMS\) policy](#) and is regularly reviewed and improved. At the European production sites, workplace regulations that are mandatory for all employees contain important safety rules pertaining to accident prevention, fire protection and what to do in the event of workplace or commuting accidents.

Certified occupational safety management

The occupational safety management systems in place at the German sites are certified externally in accordance with the ISO 45001 international standard for occupational health and safety management systems. → [MTU's current certifications](#) All workspaces in the company are part of our IMS based on the principle that “safety takes priority in what we do.” This includes the workspaces occupied by temporary workers, who are included in occupational safety measures in the same way as permanent employees. A management system based on the ISO 45001 standard has been established at the new production site in Serbia, which started operations at the end of 2022.

We strive to prevent health and safety risks to our employees and third parties. Workplaces are regularly assessed for any risks and hazards they present for employees. If potential burdens or hazards are identified, we take measures to eliminate them or reduce them to a minimum.

With the aim of permanently reducing the number of accidents and reaching a level of safety that aspires to prevent any accidents whatsoever, the local occupational safety officers record all accidents according to uniform categories (categories 1–5, near miss to fatal accident) and investigate them together with the affected employees / temporary workers and their manager. Should the assessment reveal specific aspects pertaining to the cause of accidents, we will take further steps to increase safety precautions. In the same way, near misses are recorded and evaluated. We strongly encourage the workforce to report unsafe situations. Safety training at least once a year is mandatory for all employees throughout the Group; for production employees, it is sometimes held monthly. We train all employees and temporary workers on health and safety matters when they first start working at MTU. In addition, managers receive repeated mandatory training on occupational safety. First-aiders are appointed and obligated to attend a refresher course every two years. Additional functions are fire safety assistants and safety officers. The local technical departments carry out ongoing prevention work at the company's sites through training sessions or information campaigns.

HIGH LEVEL OF SAFETY



5.4 Accidents

This rate for lost-time accidents per 1,000 employees also mean a safe working environment for 2022. By comparison, the industry average is 33.1 accidents*.

*Category 4, more than 3 days lost, German metalworking industry

Accident-free and low-stress workspaces form part of our IMS policy. We define annual tolerance thresholds for workplace accidents at our production sites. This cumulative value for accidents with absence represents a tolerable accident rate at the site. The threshold ranged from 0 to 14 for 2022, depending on the site, and was met at one of the five production sites. Looking at the MTU Group as a whole, 63 lost-time accidents (category 3 and 4 accidents involving at least one day lost, excluding commuting accidents) were recorded in the reporting year. This means accident figures fell slightly and the Group-wide accident rate fell from the previous year's 6.2 reportable workplace accidents per 1,000 employees to 5.4. The accident rate is low overall and below the industry average for the German metalworking industry (33.1 accidents per 1,000 employees for accidents entailing more than three days lost [category 4], as recorded by Wood and Metal Trade Association—BG Holz und Metall in the data for 2021). The total days lost also decreased, totaling 470 days for 2022 (2021: 820 days). As in previous years, there were no occupational accidents resulting in death.

Workplace accidents and days lost

GRI 403-9

	2022	2021	2020	2019
Workplace accidents with absence (categories 3 and 4)	63	67	50	83
Fatal workplace accidents (category 5)	0	0	0	0
Accident rate per 1,000 employees (categories 3 and 4)	5.4	6.2	4.8	7.5
Days lost (after accidents categories 3 and 4)	470	820	679	1,226

The accident statistics relate to the total workforce, including temporary agency workers. Exception: The recording of category 3 accidents for temporary agency workers began in 2021. Accidents while commuting are not included and the day of the accident does not count as a day lost. For composition of workforce sizes, see the [GRI Index](#). Contractor accidents are excluded. No accidents in case of mobile working are included. Workplace accidents were corrected for 2021 at the Vancouver site. In contrast to previous years, the accident rate is reported for all reportable accidents (category 3 and 4) as a percentage of the total workforce and temporary workers.

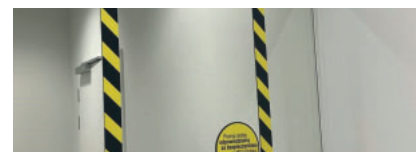
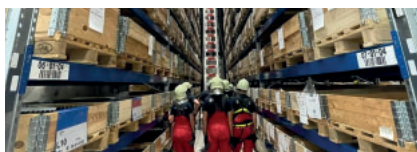
All accidents are recorded and evaluated. The analyses of accidents show that, overall, MTU has a very high level of technical and organizational safety with regard to its machines and equipment. The accidents that do occur are frequently related to behavior and less so to the operation of machines and equipment. Most often, these are cuts or puncture wounds.

Prevention of great importance in occupational safety

The occupational safety specialists on-site derive proactive measures from regularly updated risk assessments, routine inspections of workstations, and audits in production and administration. We also use findings from such analyses and from the evaluation of existing workstations for the ergonomic and safe design of new workspaces.

The aim is to promote safety-conscious behavior among employees and to further develop the safety culture. Another focus was on high standards of ergonomic workplace design, e.g. through the introduction of technical tools. Measures are site-specific. In 2022, they included:

- Safety First awareness campaign (Munich)
- Employee survey on risk assessment (Munich)
- Health and safety day and driver training for employees (Ludwigsfelde)
- Walk-throughs for order and cleanliness, occupational safety in the shop (Hannover)
- Safety mirrors (Rzeszów)



Drills were held at the logistics center in Ludwigsfelde together with the fire department to prepare for an emergency. At the Erding and Munich sites, an action day on the prevention of cuts was held for the first time in 2022 as part of Safety First. At the Rzeszów site in Poland, mirrors in the bathrooms are to serve as a reminder of people’s own responsibility for safety on the site.

Health management at the company

Health management includes a service at the German sites that covers occupational health and—at sites with a company doctor—emergency medicine and is responsible for general preventive measures. This service is available to all employees and temporary workers.

Health rate

	2022	2021	2020
Germany	93.5%	94.9%	94.8%

Counseling services offer employees and temporary workers support with maintaining their overall work performance as well as for mental health issues. In addition, all of our German sites offer supplementary in-house and external services. This includes in-house case managers, who provide advice for employees returning to work following a long absence, as a result of sickness or an accident for instance, to ensure that they get the best possible support with their reintegration. External providers offer a comprehensive support package for family-related matters. Additional benefits offered by MTU include fitness centers, which are run either in-house or by external partners, as well as on-site physiotherapy and ergonomics training.

Blood and stem-cell donation at MTU in Munich



In the fall of 2022, we worked together with the Bavarian Red Cross and Aktion Knochenmarkspende (AKB) to create an opportunity for blood donations and stem-cell typing at MTU. The offer was received, and many employees donated blood or had themselves typed for a possible stem-cell donation.

Our employees outside of Germany can also take advantage of permanent health services. Employees in Vancouver, Canada, have access to a free Employee Assistance Program. It offers a wide variety of support services on topics such as financial planning for healthcare costs, mental health, and personal or family counselling, as well as advice on equipping workspaces in a way that promotes good health. MTU Aero Engines North America offers its employees health and welfare benefits in the form of various health insurances or workplace reintegration after a long period off work. At our site in Rzeszów, Poland, the basic medical services on offer include a doctor who is on-site once a week as well as psychological support as needed. Furthermore, employees can take part in an additional offer; last year, the online project Together for Health was continued.

If employees experience financial hardship as a result of personal illness or illness in the family, they can draw on assistance from MTU's social fund, which pools funds from executives, the Executive Board and the Supervisory Board.

Services & tools

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GRI: [103-2](#), [103-3](#), [403-1](#), [403-2](#), [403-3](#), [403-4](#), [403-5](#), [403-6](#), [403-8](#), [403-9](#)

TRAINING AND DEVELOPMENT AS A SUCCESS FACTOR

Employee development

We promote a model of lifelong learning for all and support our management in their role as managers of change to strengthen MTU's performance for the future.



As part of a train-the-trainer program, vocational school teachers from the Stara Pazova Technical School in Serbia learn about dual-track training at MTU in Munich. We are training specialists for our new location, MTU Maintenance Serbia, in line with German standards.



Innovative strength and competitiveness are key factors for success in our industry. In addition, current challenges such as climate change are causing profound changes in aviation. We are playing an active part in this transformation and shaping the future of aviation. This is the vision described in our MTU Principles. That is why we train and qualify our employees in specific important future fields such as the development of new propulsion concepts for emissions-free flight, digitalization, innovative production technologies, and new, agile working methods.

We are convinced that continuous, intensive employee development is essential for long-term success. This is why MTU is investing specifically in the training and development of its talented employees. In times of change, the company is expanding its leadership skills to include forward-looking management concepts such as change leadership in order to support change, reinforce personal responsibility and the ability to act, and convey trust and stability. Continuous personal and professional development of our employees also makes us an attractive employer for new hires and our own talented individuals. "We empower" is one of our global leadership values.

Fast Facts: #PropelledByLearning

INVESTING IN THE FUTURE



5.4

million euros is how much we invested in training our employees.

TIME FOR EDUCATION



2.0

days is how long our employees spent in training on average.

CULTIVATING TALENT



95

apprentices started their careers at MTU.

all figures at year-end 2022

In addition to industry-specific vocational training and dual work-study programs aimed at building up knowledge over the long term, we support and promote the development of all our employees—this is a key principle of corporate social responsibility as defined in the company's [Code of Conduct](#). In many areas of our business activities, aviation authorities prescribe additional qualification measures, such as mandatory training on human factors (failure through human error). Promoting training and development as well as avenues for personal development for employees and managers is also enshrined in the MTU Principles and in our HR strategy. In addition, starting in 2023, a target has been set in the area of training (average training days per employee), which will be included in the variable compensation of Executive Board members and executives. This ESG (environmental, social and governance) goal underlines how we see training our employees as a success factor for MTU's future.

The head of human resources is responsible for the training and development of employees Group-wide. The full Executive Board receives an annual update on training indicators and discusses selected training initiatives.

We invest in our employees and their skills

The huge significance of training and development is reflected in the scale of opportunities we offer and how much we invest in them. This is based on our Group-wide works agreement in Germany, which guarantees access to training for all employees and requires management to conduct an interview with each employee once a year to discuss their development opportunities (training interview). This directive applies to 81.2% of the total workforce. At our sites in Germany, the works council is also involved in employee training in accordance with the German Works Constitution Act (Betriebsverfassungsgesetz) and has a say in the annual training and development program. International sites have their own regulations; at MTU Aero Engines North America, for example, an annual development plan is agreed with all employees.

We support our employees with a wide range of offerings to continuously develop their skills in the spirit of lifelong learning. Training needs are determined annually in a regular process in an interview between manager and employee or via departmental/company interviews by the in-house training team. A training history documents completed training and development courses. Training officers are on hand to answer questions relating to needs-focused training.

An online learning portal is the cornerstone for expanding multimedia learning. Increased use of digital and hybrid learning formats should ensure and flexibly support the training of specialists at all levels in the context of remote working. The portal gives employees the opportunity to organize their own development in consultation with their manager. The training team relies on a rolling training program in order to be able to respond each year to changing needs within the company as well as to outside requirements. Our Future Readiness Program, with the aim of promoting the digital mindset in the workforce, is an additional, open offering through which employees can find information, exchange ideas and network.

Employee training GRI 404-1

	2022	2021	2020
Training days (total)	29,613	21,141	17,717
Training days per employee (Group-wide)	2.6	2.0	1.6
Training days according to employee category per manager	2.9	2.4	2.1
Training days per employee category per employee	2.6	2.0	1.6
Proportion of women in training courses	18.2%	16.0%	16.3%

Data on training days for 2022 exclude the Rzeszów site in Poland due to a lack of data availability in the IT system; the site will be included in the report again starting in 2023.

In 2022, we again continued our extensive investment in employee training. The cost of all in-house and external training activities (without apprenticeships) throughout the Group stood at EUR 5.4 million (2021: EUR 4.2 million). This increase is mainly due to the fact that more and costlier training courses could be held in person again; moreover, numerous training courses that had been postponed due to the coronavirus pandemic were held. The number of training days was also up on the previous year at 29,613 days (2021: 21,141), as was the average number of training days at 2.6 per employee (2021: 2.0).

Strengthening leadership skills in times of change

Change leadership has become an important skill for managers. That is why MTU is pushing ahead with developing its managers so they become companions and drivers in change situations in order to strengthen the company's future performance. Especially in times of change, the MTU leadership values ("We create trust", "We empower", "We transform") take on even more relevance as a shared basis for managers' values and conduct. The values are intended to provide orientation and formulate expectations for leadership behavior. To this end, we have further consolidated this leadership values process across various formats.

Virtual "leadership nuggets" on selected leadership topics provide managers with fresh momentum for their everyday leadership. A Leadership Forum regularly provides relevant information on key leadership topics, such as hybrid leadership or trust in times of crisis. Large in-person group events, the Change Leadership Days, provide a platform for inspiration and exchange. A change team in the human resources department supports managers locally in implementing changes in their work situations and provides assistance with company-wide change processes such as the Innovative Culture project.

MTU also offers development opportunities and programs across all levels in order to identify and best cultivate new talent, while supporting our existing managers in their professional development. A key tool is the Development Center, which, by way of exercises and interviews, supports high-potential employees in honing their individual development plan for assuming a management position. The process defined as part of the Development Center is designed to objectively evaluate talented individuals and promote their visibility throughout the company. In addition to Development Centers throughout Germany, an international Development Center was also held in the reporting year. Some 91% of new managers with leadership responsibilities appointed in 2022 had participated in Development Center activities; this means we have achieved a high penetration rate with this format.

Talent management also comprises a mentoring program for potential candidates from the German sites offering professional and personal development as well as cross-hierarchical and cross-divisional exchange and networking. Potential candidates are employees with the potential to take on a professional or disciplinary management role. Being designated as having potential is the first step toward participation in the talent management process.

MTU also offers new and experienced managers the opportunity to receive management transition or pit-stop coaching with optional reflection and sparring components.

Our programs

We have numerous Group-wide initiatives that we use to develop our managers and support them both professionally and personally:

- Development Center
- Management transition coaching
- First Leadership Program
- Building on Talent/International Building on Talent
- International Leadership Program

In addition, there are site-specific offerings for managers, such as "Let's leadership together" run by MTU Aero Engines Polska.

A boost for newcomers

At our MTU Aero Engines North America site, we have a rotation program for entry-level graduates that takes them through a variety of departments focusing on different areas of engineering. Moreover, we cover a certain portion of tuition fees for employees there who return to university to obtain a master's degree as part of their development plan. In Germany, we offer an 18-month junior entry and trainee program called JET, which provides comprehensive insights into MTU and its structures and processes, and prepares trainees for their future position.

Top-flight apprenticing at MTU

For us, vocational training is a central component of securing promising young employees. In Germany, we offer a solid grounding in ten different trades as part of a dual work-study approach, while the places we offer for students taking dual-track courses of study offer different specializations. We pursue a holistic approach that goes beyond specialist topics to also cover social and ecological aspects, for instance through health, occupational safety and environment days or through corporate social responsibility. → [For examples, see the section about Corporate social responsibility](#) In 2022, we took on 95 young people as apprentices at MTU in Germany.

Our new apprentices start their careers



Apprentices have made up a constant proportion of MTU's workforce for many years; in 2022 they accounted for 2.9% of the total workforce (2021: 3.3%); in Germany, where most of our apprenticeships take place, the share was 3.4%. As of the end of the year, MTU employed a total of 330 apprentices (2021: 349).

BUDDING AVIATION EXPERTS



330

apprentices were on board with us last year. They complete a two-to-three-year apprenticeship based on Germany's dual-track system or an 18-month on-the-job training course at our site in Canada.

In addition to apprenticeships, MTU also collaborates with German vocational academies in Stuttgart, Ravensburg and Berlin as well as with Baden-Wuerttemberg Cooperative State University to offer practical courses of study in business administration, information technology, mechanical engineering and business engineering. What's more, we participate in numerous educational projects and initiatives for children and young people. → [Corporate social responsibility](#)

For the new site, MTU Maintenance Serbia d.o.o, the company has established a training concept based on the dual system used in Germany in collaboration with the Aviation Academy Belgrade. To achieve a high level of qualification for the new employees and prepare them for working with the specific requirements of aviation, a large number of them are completing several months of on-the-job training at MTU's German sites.

Services & tools

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GRI: [103-2](#), [103-3](#), [404-1](#), [404-2](#)

UNGC: [6](#)

UNLOCKING THE FULL POTENTIAL

Diversity and inclusion

Different ideas and experiences broaden our horizons and make us more flexible and innovative. That's why we promote diversity and inclusion through an appreciative and inclusive corporate culture.



Aviation is still a male-dominated industry. We want that to change, and we actively promote gender diversity.



Diversity promotes innovation and is therefore important for the future of aviation and for our business success. Given the high complexity of engineering projects, it is advantageous to have mixed teams, which strengthen collaboration. As an employer, diversity makes us more attractive to new talent and is a part of our corporate social responsibility.

Promoting diversity is a key component of our corporate culture and is enshrined in the MTU Principles. To ensure an inclusive working environment within the company, MTU embraces a corporate culture based on respect and appreciation that promotes fair and cooperative conduct. MTU is actively committed to equality of opportunity and equal treatment of all employees and takes a clear stand against discrimination in the workplace. We have laid down these principles in our globally applicable Code of Conduct. We want to assign employees to positions in accordance with their skills, abilities and performance. All our employees are given the same opportunities regardless of their gender, ethnic origin, age, religion, disability or sexual orientation & identity. → [Code of Conduct](#) We have processes in place that allow breaches of the Code of Conduct or of internal guidelines to be reported to designated points of contact. → [These are laid out in detail in the chapter Human rights](#). What's more, as a signatory to the UN Global Compact sustainability initiative, MTU has committed to preventing discrimination in the workplace.

Fast Facts: #WeAreMore

WOMEN ON BOARD



16.4%

of our employees are women—and we want to expand gender diversity further.

FROM ALL OVER THE WORLD



83

nationalities are represented in our workforce. That's a lot of different cultural backgrounds.

YOUNG AND OLD



4

generations work hand in hand at MTU, from baby boomers to Gen Z. That means new ideas paired with a lot of experience.

Focus topic: Diversity

How do employees experience diversity and inclusion at MTU? What was it that encouraged women working in STEM jobs at MTU to pursue this career? And how does our new Executive Board member Dr. Silke Maurer see it?

MORE IN OUR SPOTLIGHT

MTU's commitment to diversity and equality of opportunity is also demonstrated by its status as a signatory to the [Diversity Charter](#) and as a partner company of the [Impact of Diversity](#). MTU supports the Impact of Diversity because it breaks through traditional behavior patterns and opens people up to new ideas. We also presented the Impact of Diversity Award 2022 for the "Female STEM Performance in Companies" category. This category honors companies that are particularly successful in attracting a large share of women to STEM jobs and in advancing diversity in their organization. We also support various research projects on diversity and inclusion, and we exchange information with experts, organizations and networks on this topic.



With the **Innovative Culture** project, we want to develop our corporate culture in seven fields of action. Cultural change also refers specifically to the promotion and use of individuals' diversity to overcome challenges for MTU and leverage innovation potential. Companies with high gender or ethnic diversity are more successful—the likelihood of achieving above-average profitability is 25–36% higher. This was the finding of the international study "Diversity Wins – How Inclusion Matters" by the management consultants at McKinsey (2020).



Lars Wagner
Chief Executive Officer and
Chief Sustainability Officer
MTU Aero Engines AG

“Our company stands for **diversity and equal opportunity**. The aviation sector is an international industry that connects people and cultures. We believe that a diverse team helps promote our **innovative power and collaboration**, thereby securing our **competitiveness**. We position ourselves clearly **against discrimination** in the professional world. **Equal opportunity**, regardless of gender, ethnicity, origin, age, religion, disability or sexual orientation, is the basis for our respectful corporate culture, which we strengthen and further develop through a large number of individual measures.”

Diversity concept takes various aspects into account

Our diversity concept takes into account various aspects such as gender, cultural background, age and experience, disability, and sexual orientation and identity. The MTU Diversity Officer is responsible for diversity issues throughout the Group and reports directly to the Senior Vice President, Human Resources. They work closely with HR policy/strategy and are in continuous communication with local HR departments to support the needs of local employees. The aim is to actively develop and strengthen diversity within MTU. We provide regular updates on diversity and inclusion in our internal media and via our social media channels. We use training courses and presentations to draw the attention of employees and managers to the positive effects of diversity and an inclusive working environment at MTU, and to raise awareness of unconscious bias and for a working environment free of discrimination.

We support employee resource groups (ERGs), i.e., self-organized networks and groups of employees that promote a diverse, inclusive work atmosphere. These networks offer employees a way to make their concerns visible and provide impetus for collaboration within the company. This helps us better incorporate diverse experiences and perspectives from the workforce into our decision-making. There is, for example, a Network of Engine Women (NEW) founded under the auspices of MTU’s then Chief Technology Officer and now CEO, Lars Wagner, as well as informal networks such as the Young Professionals or a network of Spanish-speaking employees.

Female empowerment: Increasing the proportion of women at all levels

Aviation has always offered numerous career opportunities of a technical nature and is still dominated by men. We consciously focus on change and actively promote the inclusion of gender diversity. For management levels below the Executive Board, the target was 13% at the German sites by mid-2022. As of the reporting date of June 30, 2022, the share was 12.3%. MTU has not yet been able to realize potential equally in all areas of the company, and has not been able to fill succession positions with female high-potential employees to the extent hoped for. We expect our various initiatives to get more women into leadership to have a greater impact in the medium term. In addition, almost one-third (28.3%) of the Development Centers in 2022 were attended by women, which makes us confident that we will be able to further increase the proportion of women in management in the future. The Development Center is a personal development program for high-potential employees. The Executive Board has set a new target of 15% for the first management level below the Executive Board and 20% for the second management level below the Executive Board by June 30, 2027.

We had set a separate goal for the Executive Board of having at least one female member. With the appointment of Dr. Silke Maurer as Chief Operating Officer as of February 1, 2023, we have achieved this goal, originally set for June 30, 2022. The Supervisory Board has two female members each on the employee and shareholder sides. [More information available in MTU's corporate governance report for 2022 \(p. 128\)](#)

PROPORTION OF WOMEN



16.4%

We are getting more women excited about our tech world. The proportion of women at MTU has risen steadily in recent years—a development that we want to continue to drive forward.

The Executive Board is kept regularly informed about the measures that have been initiated to promote equality of opportunity as well as gender diversity. In addition, it presents a report on equality at the works meeting at the German sites once a year. In Germany, the works council is involved in decisions subject to co-determination, such as flexible working time rules.

The principal focus of our initiatives is to secure more female employees for the company, identify and promote female talent, and offer female employees greater support throughout their careers. To this end, we participate in mentoring programs, including:

- Cross-Mentoring Munich Program
- Mentoring Program offered by the University of Stuttgart for women studying and in research
- “Project U” project for female students of STEM subjects at Leibniz University Hannover

Proportion of women
GRI 102-8, 405-1

	2022	2021	2020
Workforce	16.4%	15.6%	15.1%
Managers	12.9%	11.8%	11.3%
Apprentices	15.8%	14.9%	16.7%
New hires	21.7%	20.5%	21.5%

Share of women in the workforce and in management positions as a proportion of the active workforce for trainees/apprentices, relating to total workforce; recorded at the end of each year; we do not have figures on the proportion of women by employee group. The proportion of women in new hires by region is shown in the Notes.

When it comes to the proportion of women in the workforce, we see an ongoing upswing over recent years. The current share is 16.4%. We succeeded in increasing the Group-wide proportion of women in management slightly to 12.9% by the end of 2022. We actively consider diversity and equality of opportunity when filling positions and selecting new employees. Women made up 21.7% of new hires across all hierarchical levels, which is higher than the current proportion of women in the company. Of the employees completing an apprenticeship at MTU, 15.8% were women.



For the past ten years, the [Women's Career Index \(FKi\)](#) has been honoring employers who have made a special contribution to diversity and inclusion projects on a national and international level. We are delighted that we have again been selected as one of the top 10 award-winning companies in 2022. At the same time, we know that we still have a lot to do.

In addition, we are involved in educational initiatives aimed specifically at young female talent. For instance, we are a project partner in Komm, mach MINT!, a German STEM initiative that aims to inspire more women to pursue qualifications and careers in the fields of science, technology, engineering and mathematics. The Women Researchers Camp, organized by the Bavarian Business Education Association, has also been an integral part of our promotion of young female talent for years. Each year, we give female school students an insight into the working world of female engineers and research at our company.

Programs and initiatives (in-house and external)

- Network of Engine Women
- [Munich Memorandum for Women in Management](#)
- [Cross-Mentoring Munich Program](#)
- [The MTU “Studienstiftung” foundation for female students in scientific and technical fields](#)
- [Girls’ Day](#)
- [The Lower Saxony Technical Internship \(“Niedersachsen Technikum”\)](#)
- [Komm, mach MINT! \(a German STEM initiative\)](#)

We have a range of offers open to all employees to improve their work-life balance, including flexible working hours, services to assist families and mobile working opportunities. → [More information under Collaboration and leadership](#)

Everyone is welcome



As an early signatory to the Charter of Diversity, MTU has for years been committed to creating a working environment that is free from prejudice, one that recognizes and supports people’s diverse potential. We want to be a positive example of diversity, create a culture of impartiality and ensure all employees have equality of opportunity in the workplace. This approach is inclusive of employees who identify themselves as lesbian, gay, transgender or intersex. We embrace diversity and welcome all employees who wish to enhance the company. Every person should be able to openly declare their sexual orientation or gender identity without experiencing any disadvantages as a result.

Individual talent should be able to unfold within a respectful and appreciative environment with an emphasis on solid performance and personal commitment. We support public initiatives to prevent bullying and discrimination, for instance by participating regularly in Pink Shirt Day in Canada, and we positioning ourselves against homophobia during Pride Month. We also express our appreciation for our employees in inclusive language, which we use in our internal and external corporate communications.

As part of our inclusion efforts, we recognize the importance of integrating employees with disabilities. In 2022, the proportion of our employees in Germany with disabilities was 4.6%. At our sites in Germany, we have elected representatives for employees with severe disabilities as well as dedicated inclusion officers who act as points of contact for issues relating to disability. Our sites, and especially new buildings, are designed with accessibility in mind.

Wisdom meets youth: Productively combining experience and impetus

Cross-generational collaboration makes it possible to combine valuable experience and new impetus in a productive way. This is why we believe in good relations between young and old, and we take age diversity into consideration in our company. At our company, four generations work hand in hand—from baby boomers to Gen Z, the youngest generation to enter the job market. We are meeting the challenges associated with our aging workforce in Germany and the fact that people are working longer from career entry to retirement. To secure the long-term performance of our employees, we operate a company health management system → [Occupational health and safety](#). Employees in every age group receive equal access to training and development. We offer a variety of career opportunities geared toward younger generations: Apprenticeships, dual work-study programs, trainee programs and development programs for high-potential employees → [Employee development](#). The interests and needs of young employees in particular are also represented by an elected youth and apprenticeship council. New recruits and young talent can exchange information via the in-house “Young Professionals” network.

Age groups GRI 405-1

	2022	2021	2020
< 30 years	17.3%	16.2%	16.4%
30 - 50 years	55.8%	55.1%	53.7%
> 50 years	26.9%	28.6%	29.9%

Measured in terms of active workforce, at year-end in each case; for composition of workforce sizes, see the [GRI Index](#)

Inclusion of diverse cultural backgrounds

WE ARE INTERNATIONAL



83

is the number of nationalities represented by our employees. They work successfully together and enrich our teams with their individual cultural backgrounds.

As a globally active company, we consider internationalization to be a key dimension of diversity. Our engine business has a global outlook, and having an intercultural workforce helps us to succeed in different markets. We promote internationality in our workforce and intercultural understanding, e.g. through intercultural training and cross-site dialogue formats. → [Learn more about our training programs here](#) Secondments to our international sites form an important part of our HR policy for promoting intercultural skills. In the reporting year, some 70 employees were working for MTU abroad. Apprentices are also given the opportunity to gain international professional experience.

We have strong roots in Germany, but our character draws on a variety of cultural backgrounds: our employees represent 83 different nationalities. We take an active stand against xenophobia and in favor of diversity and equality of opportunity, for instance as part of the International Day for the Elimination of Racial Discrimination.

Services & tools

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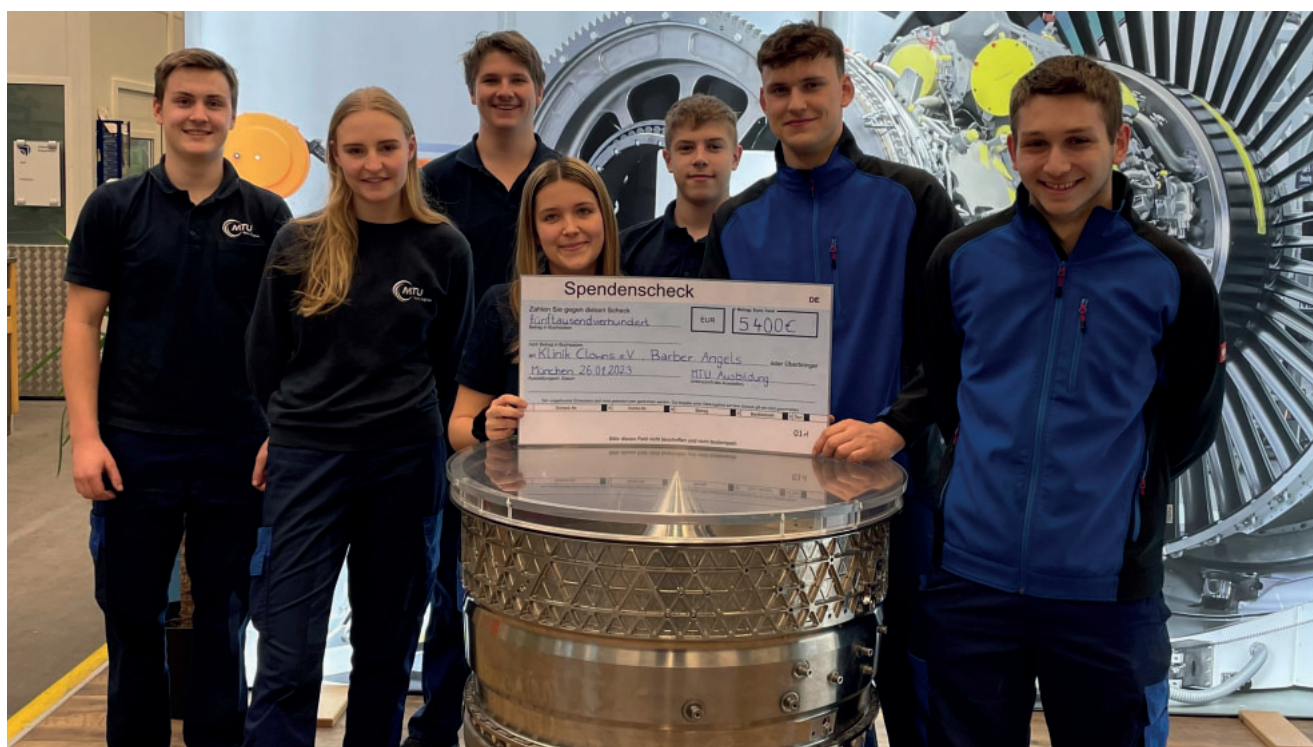
GRI: 102-8, 102-12, 103-2, 103-3, 401-1, 405-1

UNGC: 6

STRENGTHENING KNOWLEDGE ECONOMIES AND LOCAL COMMUNITIES

Corporate social responsibility

Our contribution to social development is focused primarily on research, education and training. In addition, we support social projects that have a local impact close to our locations.



With a Christmas raffle and other activities, apprentices in Munich raised 5,700 euros. They donated their funds to KlinikClowns e.V., Münchner Tafel and Barber Angels.



Corporate social responsibility is an integral part of the MTU Principles, which state: “MTU takes its responsibility for the environment and society seriously.” We are a major employer in the regions in which we operate, offering a wide range of jobs in a high-tech environment and providing training in Germany in a variety of professions under the dual-track system. Our approach to employment takes the long-term view as a matter of course and places strong emphasis on the intensive training and development of our employees. MTU invests in the expansion of its production network; the new repair site in Serbia opened in 2022. These investments strengthen the local economy and job market, and in turn have a positive effect on social aspects such as infrastructure and prosperity. We also contribute to society through the income tax we pay. → [How we add value through our economic output](#)

As we drive aviation technology forward, we rely on a new generation of skilled employees and an innovative business environment. Therefore, our concept of corporate citizenship revolves around science and engineering initiatives. We seek out interaction and collaboration with the world of science and research and foster dialogue with young people and new talent.

We have built strategic alliances with research partners to foster links between universities and industry and to safeguard our capacity for innovation. Together with partners from industry, research and teaching, we have built up a strong technology network. → [Our technology network](#)

APPRENTICES BUILD HUT FOR A GROUP HOME



→ [To the press release](#)

A group of MTU apprentices built a 20 m² wooden hut for traumatized children and young people in a group home in Markt Indersdorf, a town near Munich. This kind of regular commitment to charitable organizations is one way we foster social skills in our training programs.

Promoting access to knowledge and technologies

We run a series of sponsorship schemes at the University of Stuttgart and the German Aerospace Center that support young researchers for a number of years after they finish their degrees, and we provide financial backing for a Deutschlandstipendium, or “Germany Scholarship,” at Leibniz Universität Hannover. Together with Technische Universität Braunschweig, we operate a maintenance laboratory to enable students to experience engine maintenance on our premises as part of their master’s studies. In cooperation with the Business4School project, an initiative that aims to foster business skills in schoolchildren, managers at MTU Maintenance Hannover give insights into their work at local schools. MTU Aero Engines Polska has established alliances with the AGH University of Science and Technology in Kraków, the Lezajsk Technical School, and the Rzeszów University of Technology, and supports them in various activities (e.g. student teams in the national Xchallenge robotics championship or the ProtoLab Academy in the field of IT for interested students). MTU Aero Engines North America maintains a partnership with the CREC Academy of Aerospace and Engineering and provides financial support for the University of Connecticut’s EUROTECH scholarship program. Also in 2022, MTU AENA employees taught classes at a local high school.

One long-term program that we support in Germany is the [MTU Studien-Stiftung](#), a foundation through which we encourage highly talented young women studying scientific and technical disciplines. As well as providing financial grants, the foundation offers personal advice and mentoring to help students get started with their careers. MTU employees volunteer their time to the foundation.

MTU research experts give regular presentations and guest lectures at universities, and we have endowed a chair for aircraft engine structural mechanics at the University of Stuttgart as well. We offer trainee programs, dual vocational training, work placements for high school students, work experience for students and opportunities for writing bachelor's/master's/doctoral theses at our European sites. These are key factors on the labor market. In 2022, there were 509 students working with us in a wide variety of areas as part of their undergraduate or postgraduate program, or working during school vacations.

Each year, MTU confers the [Wolfgang Heilmann Science Award](#) for outstanding achievements by talented young students performing research in the field of aircraft engines at the Karlsruhe Institute of Technology. In addition, we are an industry sponsor of a prestigious German [award for aerospace journalism](#).

MTU Maintenance Hannover has supported the Jugend forscht regional contest there, designed to get young people interested in STEM subjects. In 2022, the theme was "Ingenious by chance?" A total of 104 participants grappled with current topics and issues to come up with creative solutions. An independent jury, which included people from MTU, selected the best projects from the 51 entries for the state-level competition.

MTU Aero Engines Polska is a partner company of RoboLAB, a new project in the part of Poland known as Aviation Valley. Launched in 2022, RoboLAB will enable primary and secondary school students to design and build robots for entry into international competitions.

Further educational initiatives in which MTU participates:

- Komm, mach MINT! (a German STEM initiative)
- Research Camp for Girls
- Girls' Day
- Teachers in Industry
- IdeenExpo science exhibition in Hannover

Support for a broad range of local charities

We support various social institutions. These are generally charitable organizations, preferably with a social focus, to which we provide assistance in the form of financial or in-kind donations. A key factor in selecting recipients is a local/regional connection or a thematic link to MTU. We prioritize support for specific projects over general institutional funding. The subsidiaries concerned select these projects and participate in them on their own initiative, following careful research and consideration. Internal guidelines govern the granting of donations and sponsorship, and a centrally managed clearance and approval process ensures that the rules are adhered to.

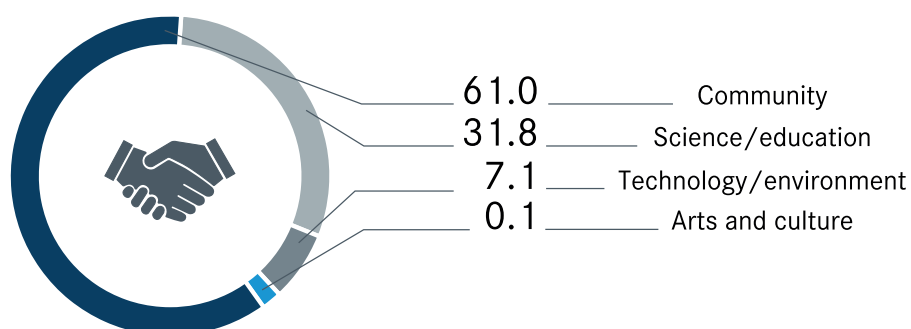
RELIABLE SUPPORT FOR DIE ARCHE



→ Die Arche (The Ark) is devoted to improving the lives of children in Potsdam

For many years, MTU Maintenance Berlin-Brandenburg has been supporting Die Arche with an annual donation for children and youth welfare. Another tradition is an end-of-year meeting with the organization's director, Christoph Olschewski (pictured left), who reports on how Die Arche is doing and which projects have been implemented—thanks in part to MTU's support. At last year's meeting, he said that war, inflation and the generally tough economic situation have caused Die Arche to lose many smaller sponsors, which is why MTU's regular donations are so important. "I have the utmost respect for what Die Arche's team has been able to accomplish. We definitely want to keep supporting their work, and to a greater extent," says Managing Director André Sinanian.

Donations and sponsorship in 2022 (distribution in %)



In the reporting year, we supported around 112 projects, institutions or organizations. We also work with partners near our locations; for example, our commitment to the Munich Business Climate Pact. We provide the TurBienchen daycare center, a parent-led initiative situated close to the company gates in Munich, with ongoing support in the form of financial and in-kind donations. The new site in Serbia plans to build a daycare center near the plant, which will be open to parents outside of MTU as well.

Also in 2022, we restructured a social fund, originally established in connection with the Covid-19 pandemic, which pools funds from executives, the Executive Board and the Supervisory Board. Since then, the funds have been donated to MTU employees who find themselves in financial difficulties through no fault of their own, and to humanitarian causes outside the company, such as aid for Ukraine or victims of natural disasters.

Further institutions that we supported e.g. in 2022

- Condrobs e.V., a charity in Munich for helping disadvantaged people with addiction and other problems
- DIGNUM Foundation, Mirków, Poland, which helps the elderly and disabled live in dignity at home
- Münchner Tafel e.V. and Langenhagener Tafel e.V., which provide food to those in need
- A “warmth café” in the city of Langenhagen, where people can go to warm up from the cold
- Straßenkinder e.V., an organization that helps street children in Berlin
- Children’s Day at the school of Hospital No. 2, Rzesów
- Starfish Pack, an organization that helps feed children and families in North Delta, Canada

Social Day with CEO/CSO Lars Wagner



At the Social Day, managers from the technology department joined forces with Chief Sustainability Officer Lars Wagner (on the left/right photo) to build a skate ramp and seesaw at the Caritas “JumpIn” children’s and youth center in the immediate vicinity of MTU. Before the MTU crew departed, the head of the facility presented Lars Wagner with a small thank-you from the children: a book they had put together themselves.

Large number of activities at our locations

We welcome our employees' voluntary efforts to support good causes. This is covered by an internal company agreement. In Germany, the company allows staff to undertake projects with the German Federal Agency for Technical Relief or the volunteer fire department during their paid workday, and offers the services of lay justices for labor tribunals and social justice courts and of examiners for the Chamber of Industry and Commerce.



Employees from Canada, the U.S., Poland and Germany cycled from Munich to Merano, Italy, and back on the “Plant-to-Plant” bike tour, raising over 3,000 euros for aid organizations.



Every year on Pink Shirt Day in February, colleagues at MTU Maintenance Canada take a stand against bullying and discrimination by donning pink clothing.



Trainees from MTU Maintenance Hannover erected a play tower at Langenhagen Adventure Land.



MTU Maintenance colleagues in Serbia participated in the New Year charitable campaign of the city of Stara Pazova, which raised funds for children and needy families.



MTU employees from the U.S. “adopted” three needy families at Christmas, with a total of twelve family members of all ages, whom they presented with donations. “Adopt-a-family” is a program coordinated by Family Centered Services of New Haven.



The training and development team in Hannover rode along with the Malteser Hilfedienst “warm-up bus.” At two stations downtown, the MTU colleagues helped give out food, hot drinks, sleeping bags and chocolate..

Aid for Ukraine



Ukraine emergency aid at the Poland site, initiated by employees (left). A team of six employees (right) coordinated the aid in Rzeszów, which lies close to the Ukrainian border.

As a company, MTU supports the Ukrainian population in the wartime emergency; following the outbreak of the war, the company donated some 200,000 euros in 2022 to international and national aid organizations. Some of this came from the social fund, which pools money from managers, the Executive Board and the Supervisory Board. Our location in Rzeszów, MTU Aero Engines Polska, is situated close to the Ukrainian border. Since the first days of the war, employees there have helped women, children and older people on the border to Poland. Immediately after the war broke out, a team of MTU employees set up an emergency relief organization for Ukraine that matches volunteers, aid packages and goods with people who need help. Many colleagues have been engaging in the in-house MTU initiative.

Activities include integration events for children (movies, day trips, family picnics), regular collaboration with the homeless shelter in Rzeszów for women and children (e.g. building renovation, English lessons for the children), or providing aid to Ukraine together with the volunteer fire department.

This varied and exceptional involvement is worthy of our appreciation and utmost respect. As an employer, we provide all employees that want to help on-site or take in refugees at their homes with non-bureaucratic and individual support—for example, by giving them flexible working hours or time off work.

The organizations MTU has supported as part of its aid to Ukraine

- Luftfahrt ohne Grenzen (Wings of Help) e.V.
- Civil Relief Munich
- PAH – Polish Humanitarian Action
- PCPM – Polish Center of International Aid
- Polish Medical Mission
- Refugio Munich e.V., a refugee support organization
- UN Refugee Aid Germany
- Straßenkinder e.V., help for children and families in Ukraine
- German air ambulance, Ukraine airlift

Services & tools

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GRI: [103-2, 103-3, 201-1](#)

UNGC: [7](#)

REPORTING IN ACCORDANCE WITH STANDARDS

GRI and UN Global Compact index

The MTU Aero Engines 2022 Sustainability Report was drawn up in compliance with the Global Reporting Initiative (GRI) and meets the GRI standards (“Core” option). The GRI index contains cross-references of the GRI disclosures to the individual chapters in the report. The Sustainability Report also documents our commitment to and progress on the ten principles of the UN Global Compact (Communication on Progress). The GRI Index also includes an allocation to the ten principles of the UN Global Compact.

General disclosures

Organizational profile (102-1 – 102-13)

GRI standard	UNGC principle		Reference/Comment
102-1		Name of the organization	The enterprise MTU
102-2		Activities, brands, products and services	The enterprise MTU
102-3		Organization’s headquarters	The enterprise MTU
102-4		Countries where the organization operates	The enterprise MTU
102-5		Nature of ownership and legal form	The enterprise MTU 2022 Annual Report, p. 20
102-6		Markets served	2022 Annual Report, p. 161, table 6.1
102-7		Scale of organization	The enterprise MTU

102-8	6	Total workforce	<p>Collaboration and leadership</p> <p><i>Total workforce at fully consolidated sites including apprentices, interns, thesis students and doctoral candidates, students and holiday staff, temporary part-time employees on parental leave, and marginal workers, but excluding temporary workers and inactive employment contracts; as at December 31 each year. Active workforce: employees with permanent or fixed-term contracts, temporary part-time employees on parental leave, excluding students, interns, trainees/apprentices, short-term holiday workers, temporary workers and employees from external companies</i></p> <hr/> <p>Nonfinancial KPI</p> <hr/> <p>Diversity and inclusion</p>
102-9		Supply chain	Supplier management
102-10		Changes to the supply chain	Supplier management
102-11		Precautionary approach	Environmental management
102-12		External charters, principles, or other initiatives	<p>Sustainability strategy and organization</p> <hr/> <p>Compliance</p> <hr/> <p>Climate impact of aircraft engines</p> <hr/> <p>Environmental management</p> <hr/> <p>Diversity and inclusion</p>
102-13		Memberships	<p>Selection:</p> <ul style="list-style-type: none"> • Aviation Initiative for Renewable Energy in Germany e.V. (aireg) • Bauhaus Luftfahrt e.V. • Bavarian Employers' Associations for the Metalworking and Electrical Industries (bayme) • bavAIRia e.V.

- Bund der Freunde TU München
 - German Aerospace Industries Association (BDLI)
 - co2ncept plus, Association of the Economy for Emissions Trading and Climate Protection e.V.
 - Federation of German Security and Defence Industries (BDSV)
 - Deutsche Gesellschaft für Luft- und Raumfahrt – Lilienthal-Oberth e.V. (DGLR)
 - Friends and Sponsors of the Deutsches Museum
 - Deutsches Verkehrsforum e.V. (DLR)
 - German Aerospace Center (DLR)
 - Enterprise for Health
 - European Aerospace Quality Group
 - Forum Luft- und Raumfahrt e.V.
 - Gesellschaft für Datenschutz und Datensicherheit e.V.
 - Hydrogen Europe
 - IATA Strategic Partnerships
 - Chamber of Commerce and Industry for Munich and Upper Bavaria (IHK)
 - MINT-Campus Dachau
 - Münchener Bildungsforum gem. n.e.V. (Munich-based network for employee training and HR development)
 - Stifterverband für die Deutsche Wissenschaft (sponsors' association for German science)
 - Trace International, Inc.
 - Bavarian Industry Association
 - Bavarian Employers' Associations for the Metalworking and Electrical Industries (vbm)
 - UN Global Compact (signatory)
 - Unternehmer TUM MakerSpace GmbH
 - Unternehmer TUM Solutions GmbH
 - Association of German Engineers (VDI)
-

 Strategy (102-14)

GRI standard	UNGC principle		Reference/Comment
102-14	1-10	Statement from the Executive Board	Foreword by the Chief Executive Officer

 Ethics and integrity (102-16)

GRI standard	UNGC principle		Reference/Comment
102-16	10	Values, principles and codes of conduct	Compliance Collaboration and leadership

 Corporate governance (102-18)

GRI standard	UNGC principle		Reference/Comment
102-18		Governance structure	2022 Annual Report, p. 8-9, 16-17

Stakeholder engagement (102-40 – 102-44)

GRI standard	UNGC principle		Reference/Comment
102-40		Stakeholder groups	Stakeholder dialogue
102-41	3	Collective bargaining agreements	Collaboration and leadership
102-42		Identifying and selecting stakeholders	Stakeholder dialogue
102-43		Approach to stakeholder engagement	Stakeholder dialogue Product quality and flight safety Research and development Environmental management Collaboration and leadership
102-44		Key topics and concerns of stakeholders	Stakeholder dialogue

Reporting practice (102-45 – 102-56)

GRI standard	UNGC principle		Reference/Comment
102-45		Consolidated Group entities	About this report
102-46		Material aspects identified	Sustainability strategy and organization
102-47		List of material topics	Sustainability strategy and organization
102-48		Restatements of information	<i>If climate figures from previous years have been recalculated, this is indicated alongside the data in question in the report.</i>
102-49		Changes in reporting	About this report
102-50		Reporting period	About this report
102-51		Date of most recent report	About this report
102-52		Reporting cycle	About this report
102-53		Contact point for questions regarding the report	About this report
102-54		Option to apply GRI standards	About this report
102-56		External assurance	About this report

Management approach

Management approach (103-1 – 103-3)

GRI standard	UNGC principle		Reference/Comment
103-1		Boundaries to material topics	Sustainability strategy and organization <i>Management approaches to the relevant topics</i>
103-2	1-10	Management approach and its components	<i>The management approaches are presented for each material topic, for ecological topics in the field of action Production & Maintenance the overarching approach is presented under Environmental Management.</i>
103-3	1-10	Evaluation of the management approach	Sustainability strategy and organization Stakeholder dialogue <i>Management approaches to the material topics</i>

Topic-specific standards

Economic standards (201-1 – 207-2)

GRI standard	UNGC principle		Reference/Comment
		Economic performance	
103-2, 103-3	7	Management approach	Sustainability strategy and organization Corporate social responsibility Climate impact of aircraft engines
201-1		Value generated and distributed	The enterprise MTU Corporate social responsibility <i>Key figures are not broken down by market or region</i>
201-2	7	Financial implications and risks due to climate change	Climate impact of aircraft engines
201-3		Defined benefit plan and retirement plans	Collaboration and leadership
		Procurement practices	
103-2, 103-3		Management approach	Supplier management
204-1		Proportion of spending on local suppliers	Supplier management
		Anti-corruption	
103-2, 103-3	10	Management approach	Compliance
205-1	10	Operations assessed for risks related to corruption	Compliance

205-2	10	Information and training about anti-corruption	Compliance
205-3	10	Confirmed incidents of corruption and actions taken	Compliance
		Anti-competitive behavior	
103-2, 103-3		Management approach	Compliance
206-1		Legal actions for anti-competitive behavior, anti-trust and monopoly practices	Compliance
		Taxes (GRI 2019)	
103-2, 103-3		Management approach	The enterprise MTU
207-1		Approach to tax	The enterprise MTU
207-2		Tax governance, control and risk management	The enterprise MTU

GRI Standards 2016, unless otherwise stated

Environmental standards (301-1 –308-2)

GRI standard	UNGC principle		Reference/Comment
		Materials	
103-2, 103-3	7, 8	Management approach	Environmental management Conservation of resources
301-1	7, 8	Materials used by weight or volume	Conservation of resources
301-2	7, 8	Recycled input materials used	Conservation of resources

301-3	8	Recycled products and their packaging materials	Conservation of resources
<hr/>			
Energy			
<hr/>			
103-2, 103-3	7, 8	Management approach	Climate action at production sites
<hr/>			
302-1	7, 8	Energy consumption within the organization	Climate action at production sites
<hr/>			
302-4	7, 8	Reduction of energy consumption	Climate action at production sites
<hr/>			
302-5	8, 9	Reductions in energy requirements of products and services	Climate impact of aircraft engines
<hr/>			
			Spotlight Climate
<hr/>			
Water and effluents (GRI 2018)			
<hr/>			
103-2, 103-3	7, 8	Management approach	Environmental management
<hr/>			
			Conservation of resources
<hr/>			
303-1	7, 8	Interactions with water as a shared resource	Conservation of resources
<hr/>			
303-3	7, 8	Water withdrawal	Conservation of resources
<hr/>			
303-4	7, 8	Water discharge	Conservation of resources
<hr/>			
303-5	7,8	Water consumption	Conservation of resources
<hr/>			
Emissions			
<hr/>			
103-2, 103-3	7-9	Management approach	Environmental management
<hr/>			
			Climate action at production sites
<hr/>			
305-1	7, 8	Direct (Scope 1) greenhouse gas emissions	Climate action at production sites
<hr/>			

305-2	7, 8	Energy indirect (Scope 2) greenhouse gas emissions	Climate action at production sites
305-3	7-9	Other indirect (Scope 3) greenhouse gas emissions	<p>Nonfinancial KPIs</p> <p><i>CO2 emissions that do not result from the use of energy by MTU in its on-site operations fall under Scope 3. These include upstream value creation at suppliers, downstream product use, and employee travel to and from MTU. We are not yet able to present Scope 3 in full. We have included a Scope 3 accounting project in our sustainability strategy. The aim is to record and evaluate significant upstream and downstream activities and to establish a corresponding management system at the fully consolidated locations.</i></p>
			Climate impact of aircraft engines
305-4	7, 8	Intensity of greenhouse gas emissions	Climate action at production sites
305-5	8, 9	Reduction of greenhouse gas emissions	Climate action at production sites
305-7	7, 8	Significant airborne emissions	<p>Nonfinancial KPIs</p> <p><i>To evaluate emissions, we use the emission factors from the German Environment Agency's ProBas database. Where we deviate from this: for sulfur dioxide we use emission factors from our own measurements for kerosene; for nitrogen oxide and carbon monoxide from the operation of engines we use MTU-specific factors (average values from NOx and CO emissions according to the ICAO database for all engines tested by us for the climb out operating point). For indirect emissions we use specific, locally adjusted emission factors based on ProBas.</i></p>

Waste (GRI 2020)

103-2, 103-3, 306-1, 306-2	7, 8	Management approach	Environmental management
			Conservation of resources
306-3	7	Waste generated	Conservation of resources
306-4	7	Waste for recycling	
306-5	7	Waste for disposal	Conservation of resources
		Environmental compliance	
103-2, 103-3	7	Management approach	Environmental management
307-1	7	Non-compliance with environmental laws and regulations	Environmental management
		Supplier environmental assessment	
103-2, 103-3	8	Management approach	Supplier management
308-1	7	New suppliers that were screened using environmental criteria	Supplier management
308-2	8	Negative environmental impacts in the supply chain	Supplier management

GRI Standards 2016, unless otherwise stated

Social standards (401-1 – 419-1)

GRI standard	UNGC principle		Reference/Comment
		Employment	
103-2, 103-3	6	Management approach	Collaboration and leadership
401-1	6	Employee turnover	Collaboration and leadership

Nonfinancial KPIs

Diversity and inclusion

Collaboration and leadership

Collaboration and leadership

Nonfinancial KPIs

Labor/management relations

Collaboration and leadership

401-2		Benefits provided to full-time employees	
401-3	6	Parental leave	
103-2, 103-3		Management approach	
402-1	3	Minimum notice periods regarding operational changes	<p><i>Germany: Agreements between the employer and the works council that are governed by collective agreements can be terminated with three months' notice under Section 77 of the German Works Council Constitution Act (Betriebsverfassungsgesetz). As a rule, this is also laid down in the collective agreements. In cases in which the arbitration body's decision can overrule an agreement between the works council and employer, the regulations governing the notice period remain valid until replaced. Also laid down in the collective agreements are the notice periods for the assertion of claims for employers as well as employees. Poland: In accordance with Polish law Indefinite and fix-term employment contract - 2 weeks up to 6 months; 1 month up to 3 years of employment; 3 months after 3 years of employment. Serbia: 4 weeks. Netherlands: 1 month. Canada: The standard notice period is two weeks. If the numbers of employees is greater than 10, consideration must be given and determination if 60 days notice to be given. USA: 60 days for reduction of 50% or more of the workforce under federal WARN Act.</i></p>

		Occupational health and safety (GRI 2018)	
103-2, 103-3		Management approach	Occupational health and safety
403-1		Occupational health and safety management system	Occupational health and safety
403-2		Hazard identification, risk assessment and investigation of incidents	Occupational health and safety
403-3		Occupational health services	Occupational health and safety
403-4		Worker participation, consultation, and communication	Occupational health and safety <i>The entire workforce of all our production sites is fully represented in the locally organized occupational safety committees, the composition of which reflects the legal requirements for employer and employee representation in the respective countries .</i>
403-5		Worker training	Occupational health and safety
403-6		Promotion of worker health	Occupational health and safety
403-8		Workers covered by occupational health and safety management system	Occupational health and safety
403-9		Work-related ill health	Occupational health and safety
		Training and education	
103-2, 103-3	6	Management approach	Employee development
404-1	6	Average hours of training per year per employee	Employee development
404-2		Lifelong learning	Employee development
404-3	6	Percentage of employees receiving regular performance reviews	Collaboration and leadership

Diversity and equality of opportunity			
103-2, 103-3	6	Management approach	Diversity and inclusion
405-1	6	Diversity of governance bodies and employees	Diversity and inclusion <i>Active workforce: employees with permanent or fixed-term contracts, temporary part-time employees on parental leave, excluding students, interns, trainees/apprentices, short-term holiday workers, temporary workers and employees from external companies. Nationalities: We don't track Nationalities on the US, but rather state-mandated diversity metrics based on ethnicity. Number of nationalities for the MTU Group therefore excludes MTU Aero Engines North America.</i>
405-2	6	Ratio of basic salary and remuneration of women to men	Collaboration and leadership
Non-discrimination			
103-2, 103-3	6	Management approach	Human rights
406-1	6	Cases of discrimination and corrective actions taken	Human rights
Freedom of association and collective bargaining			
103-2, 103-3	2, 3	Management approach	Human rights
407-1	2, 3	Operations and suppliers for which the right to freedom of association and collective bargaining may be at risk	Human rights Human rights in the supply chain
Child labor			
103-2, 103-3	2, 5	Management approach	Human rights
408-1	2, 5	Operations and suppliers at significant risk for incidents of child labor	Human rights Human rights in the supply chain

Forced or compulsory labor			
103-2, 103-3	2, 4	Management approach	Human rights Human rights in the supply chain
409-1	2, 4	Operations and suppliers with significant risk for incidents of forced and compulsory labor	Human rights Human rights in the supply chain
Human rights assessment			
103-2, 103-3	1, 2	Management approach	Human rights Human rights in the supply chain
412-1	2	Operations that have been subject to human rights reviews	Human rights
412-2	1	Employee training on human rights policies or procedures	Compliance
412-3	2	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	Human rights Human rights in the supply chain
Supplier social assessment			
103-2, 103-3	2	Management approach	Supplier management
414-1	2-5	New suppliers that were screened using social criteria	Human rights in the supply chain Supplier management
414-2	2-5	Negative social impacts in the supply chain and actions taken	Human rights in the supply chain Supplier management
Public policy			
103-2, 103-3	10	Management approach	Stakeholder dialogue

415-1	10	Political contributions	Stakeholder dialogue
Customer health and safety			
103-2, 103-3		Management approach	Product quality and flight safety
416-1		Products and services for which health and safety impacts were assessed	Product quality and flight safety
416-2		Incidents of non-compliance concerning the health and safety impacts of products and services	Product quality and flight safety
Marketing and labeling			
103-2, 103-3		Management approach	Product quality and flight safety
417-1		Requirements for product labelling and information	Product quality and flight safety
417-2		Incidents of non-compliance concerning product labeling and information	Product quality and flight safety
417-3		Incidents of non-compliance concerning marketing communications	In the reporting period, there were no incidents of non-compliance with the regulations.
Customer privacy			
103-2, 103-3		Management approach	Compliance
418-1		Substantiated complaints concerning breaches of data protection	Compliance
Socioeconomic compliance			
103-2, 103-3		Management approach	Compliance
419-1		Non-compliance with laws and regulations in the social and economic area	Compliance

GRI Standards 2016, unless otherwise stated

More information about:

[The GRI standards for sustainability reporting](#)

[The ten principles of the UN Global Compact](#)

Services & tools

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ONLINE SURVEY ABOUT SUSTAINABILITY@MTU

GRI: 102-55

OUR REPORTING CONCEPT

About this report

Each year, MTU Aero Engines AG compiles a sustainability report to comprehensively inform its stakeholders about corporate responsibility (CR) of an economic, environmental or social nature within the company. The report provides information about the company's CR strategy, objectives and performance and also describes the priorities and progress made in 2022, building on the previous report. It supplements the non-financial statement in our Annual Report.

Reporting period and cycle

The reporting period covers financial year 2022 (January 1 to December 31). To better organize how information is presented and provide explanatory context for readers, activities from outside the reporting period are also cited in some cases. The report is published annually in German and English and will be available as an online report at [→ sustainability.mtu.de](https://sustainability.mtu.de) in May 2023. It is possible to obtain a [→ PDF download](#) of the report. The non-financial statement is included in the Group management report of the [Annual Report](#).

Scope of validity

The report covers all of the MTU Group sites that are treated as fully consolidated in the company's financial reporting. The information and key performance indicators refer to the specified Group reporting entity, unless otherwise indicated. This includes the following locations:

- MTU Aero Engines, Munich, Germany (headquarters)
- MTU Maintenance Hannover, Hannover, Germany
- MTU Maintenance Berlin-Brandenburg, Ludwigsfelde, Germany
- MTU Aero Engines Polska, Rzeszów, Poland
- MTU Maintenance Serbia
- MTU Maintenance Lease Services B.V., Amsterdam, Netherlands
- MTU Maintenance Canada, Vancouver, Canada
- MTU Aero Engines North America, Rocky Hill, United States

Reporting standards and topics

Global Reporting Initiative (GRI)

The 2022 Sustainability Report was drawn up in compliance with the [Global Reporting Initiative \(GRI\) and meets the GRI standards](#) ("Core" option). In accordance with these globally recognized sustainability reporting guidelines, we report on all required standard disclosures as well as on our management approaches for key topics and on selected indicators for each topic. We provide a [GRI index](#) for cross-referencing the report's contents with the GRI standards. Tables and graphics with statements relevant to GRI have been appropriately marked. The relevant GRI standards are listed at the end of each page.

A materiality matrix presents the sustainability topics that are significant for the MTU Group and shows how they are weighted from an internal (X-axis) and external (Y-axis) perspective. It is checked and updated every year as part of a materiality analysis, and serves as the basis for selecting the key topics and performance indicators for this report.

[→ Sustainability strategy and organization](#)

UN Global Compact and Sustainable Development Goals

MTU is a signatory to the [UN Global Compact](#). The 2022 Sustainability Report documents our commitment to its ten principles and our annual progress. The reporting pages and the [GRI index](#) include the assignment of content to the ten principles of the UN Global Compact. The relevant principles are also listed at the end of each page. As a signatory of the UN Global Compact, we support the [Sustainable Development Goals](#) and aim to contribute to them. We present our contribution to the SDGs under the relevant topics at the top of the page. Which SDGs we can support → [Sustainability strategy and organization](#)

Key figures and collection methods

All data and information for the reporting period was collected by the relevant departments using representative methods. Environmental KPIs are collected via the environmental management systems at the individual sites and then consolidated centrally in the CR database according to agreed criteria. The HR KPIs are collected and evaluated centrally at the headquarters in Munich for Germany, and locally for all non-German sites. Once the data is evaluated, it is sent to the CR database. All other data is requested from the CR coordinators in the relevant departments and compiled centrally in the CR database. Financial KPIs are collected and published in accordance with the International Financial Reporting Standards (IFRS).

Supplementary information and previous reports

MTU regularly informs its stakeholders about sustainability issues. You can find supplementary information, more detailed analyses and older publications online:

- [Corporate responsibility at MTU](#)
- [Compliance at MTU](#)
- [MTU Annual Reports](#)

In addition, we regularly report on important and/or current sustainability topics in central MTU publications and through various communication channels, including our social media platforms.

- [News and Media](#)

External validation of the report

The CR reporting for this sustainability report was not subject to external auditing or validation. The majority of corporate processes that underlie data collection for CR reporting are certified. We have already reported selected key figures for topics of very high importance in our non-financial statement. These have been verified by auditors as part of a limited or partly also reasonable assurance engagement.

Contacts

Please address questions about the report to corporateresponsibility@mtu.de

Forward-looking statements

This report contains forward-looking statements. These statements reflect the current understanding, expectations and assumptions of MTU Aero Engines and are based on the information available to management at the present time. Forward-looking statements provide no guarantee that certain results and developments will actually occur in the future, and they entail risk and uncertainty. Consequently, for a variety of reasons, the actual future results of MTU Aero Engines may deviate substantially from the expectations and assumptions expressed here. MTU Aero Engines assumes no obligation to update the statements contained in this communication.

Wording

We have opted for gender-neutral language in MTU's communications, so this Sustainability Report is written in an inclusive way. To ensure readability and consistency, we follow rules that we have established in German for inclusive language@MTU.

Services & tools

[DOWNLOAD CENTER AND REPORT ARCHIVE](#)

[ONLINE SURVEY ON SUSTAINABILITY@MTU](#)

GRI: [102-45](#), [102-49](#), [102-50](#), [102-51](#), [102-52](#), [102-53](#), [102-54](#), [102-56](#)

MTU's nonfinancial KPIs

Field of action Manufacturing & Maintenance

Energy consumption Scope 1 and 2 (in GWh) GRI 302-1

	2022	2021	2020
Total	306.7	331.3	307.5
Direct energy consumption, natural gas, kerosene, mobility = Scope 1	170.7	201.2	191.5
Indirect energy consumption, electricity, district heating = Scope 2	136.0	130.1	116.0

Scope 1 energy consumption results from the direct consumption of kerosene, natural gas and fuels for mobility (excluding Canada). Scope 2 energy consumption is attributable to the consumption of purchased energy (electricity and district heating). Other energy consumption (e.g. other fuels) is not reported because its contribution to total consumption by the MTU Group is not material. Data for energy consumption in external testing of engines and industrial gas turbines is not included in the data in the table. We have corrected the calorific value for natural gas, resulting in an adjusted presentation of emissions data for previous years compared to previously reported values.

CO₂ emissions (in t CO₂e equivalents) Scope 1 and 2 GRI 305-1, 305-2

	2022	2021	2020
Total	47,600	54,800	83,200
Scope 1	38,000	44,400	42,200
Scope 2	9,600	10,400	41,000

MTU's Scope 1 CO₂e emissions result from consumption of the direct energy sources kerosene, natural gas and fuels for mobility. Meanwhile, MTU's Scope 2 CO₂e emissions result from the consumption of bought-in energy (electricity and district heating). The calculation of Scope 2 emissions uses emission factors from energy suppliers (market-based method). Other sources of CO₂e such as refrigerants or other fuels are not reported as their contribution to Group emissions is immaterial.

Consumption in Canada is included, but without mobility data. CO₂e resulting from externally outsourced engine and industrial gas turbine test runs and the combustion of sustainable aviation fuels during engine test runs in Hannover is not included in the balance sheet. We have corrected the calorific value for natural gas and the emissions factor for electricity at Rzeszów site (conversion to market-based), resulting in an adjusted presentation of emissions data for previous years compared to previously reported values.

CO₂ emissions (in t CO₂ equivalents)**Scope 3**

GRI 305-3

	2022	2021	2020
Business Travel	4,300	1,130	1,970

For Scope 3, we have so far only collected CO₂e emissions from business trips (travel by aircraft, train or rental car), data collected for the MTU sites in Germany and Canada (2022), Germany and Serbia (2021), Germany and Amsterdam (2020), emission factors according to GHG Protocol

Airborne emissions (in metric tons)**Scope 1 and 2**

GRI 305-7

	2022	2021	2020
Total	175	187	243
Carbon monoxide (CO)	18	20	41
Nitrogen oxide (NO _x listed as NO ₂)	139	148	166
Sulfur dioxide (SO _x listed as SO ₂)	16	17	32
Particulates (dust)	2	2	4

Improvements in the balance sheet due to the use of sustainable aviation fuels are not taken into account, as in the case of CO₂ balancing.

Water balance (in m³)
 GRI 303-3, 303-4, 303-5

		2022	2021	2020
	Total	8,538,500	8,079,600	8,327,300
Withdrawal	Municipal water	183,400	159,900	175,000
	Groundwater	8,355,100	7,919,700	8,152,300
	Total	8,795,100	8,592,200	9,044,400
Discharge	Sewer system	141,300	121,100	110,200
	Surface water	386,100	719,800	1,458,600
	Groundwater	8,267,700	7,751,300	7,475,600
Consumption	Municipal water	42,100	38,800	64,800
	Groundwater	- 298,800	- 551,400	- 781,900

No water withdrawal or discharge in water-stressed regions; data presented in line with official wastewater and well reports and may deviate from previous publications.

At the Munich site, a proportion of the well water and some of the rainwater collected from the roofs is discharged as surface water via the Schwabenbächl stream. Rainwater is discharged into the municipal sewer system only in the event of heavy rainfall. As a result, the sum of the volume discharged into groundwater and surface water may not correspond to the volume withdrawn. The consumption is the difference between the water withdrawal and discharge. For the above reasons, the recirculation for groundwater is higher and is therefore shown negatively.

Material consumption (in metric tons)

GRI 301-1

	2022	2021	2020
Total	8,740	8,230	7,380
Production material	3,690	2,840	3,350
Consumables and supplies	4,200	3,770	3,510
Other materials	850	1,620	520

Externally sourced material for production sites; production material comprises titanium and nickel alloys and spray powder; consumables and supplies include oils, cooling lubricants, chemicals, lubricants, gases and kerosene and diesel used as fuel; the other material comprises paper, cardboard packaging and wooden pallets and boxes. For engine parts, MTU uses returnable packaging that can be reused several times.

Waste footprint (in metric tons)

GRI 306-3, 306-4, 306-5

	2022	2021	2020
Total waste	7,950	6,800	7,040
Recycled	5,680	5,310	5,440
Disposed of	2,270	1,490	1,600
Share of hazardous waste	3,420	2,760	2,790
Recycled	1,300	1,380	1,370
Disposed of	2,120	1,380	1,420

Excluding construction waste

Field of action Employees

Workforce figures

GRI 102-8

	2022	2021	2020
Total workforce	11,273	10,508	10,313
Active workforce	10,434	9,761	9,760
White collar workers	53.2%	52.7%	51.5%
Blue collar workers	46.8%	47.3%	48.5%
Temporary agency staff	309	286	180

In each case at the end of the year, composition of total workforce and reference figure for fixed-term employment contracts as well as scope of consolidation in the [GRI index](#).

Staff turnover by region

GRI 401-1

	2022	2021	2020
No. of employees that left the company	540	609	385
Germany	370	460	204
Rest of Europe	102	77	104
North America	68	72	77
Turnover rate (%)	5.8	6.8	4.2
Germany	4.9	6.2	2.7
Rest of Europe	9.9	8.6	12.1
North America	9.7	11.3	11.2

Staff turnover measured against core workforce, annual average, figures include retirements

Proportion of women

GRI 102-8, 405-1

	2022	2021	2020
Workforce	16.4%	15.6%	15.1%
Managers	12.9%	11.8%	11.3%
Apprentices	15.8%	14.9%	16.7%
New hires	21.7%	20.5%	21.5%

Share of women in the workforce and in management positions as a proportion of the active workforce for trainees/apprentices, relating to total workforce; recorded at the end of each year; we do not have figures on the proportion of women by employee group.

New hires

GRI 401-1

	2022	2021	2020
New hires, Group-wide	1,191	752	460
New hires, Germany	675	380	345
New hires, Rest of Europe	368	239	69
New hires, North America	148	133	46
Group-wide	21.7%	20.5%	21.5%
Germany	21.0%	22.9%	20.3%
Rest of Europe	23.4%	22.2%	29.0%
North America	20.3%	10.5%	19.6%

New hires measured against active workforce

Age groups

GRI 405-1

	2022	2021	2020
< 30 years	17.3%	16.2%	16.4%
30 - 50 years	55.8%	55.1%	53.7%
> 50 years	26.9%	28.6%	29.9%

Measured in terms of active workforce, at year-end in each case; for composition of workforce sizes, see the [GRI Index](#)

Employees on temporary contracts

GRI 102-8

	2022	2021	2020
Employees on temporary contracts	734	664	634
Germany	505	518	541
Rest of Europe	222	140	88
North America	7	6	5
Female employees on temporary contracts	143	112	

Data acquisition for employees on temporary contracts by gender started in 2021

Alternative working arrangements (Germany)

GRI 102-8, 401-3

	2022	2021	2020
Part-time employees total	680	596	623
Part-time employees, male	323	274	
Part-time employees, female	357	322	
Employees on parental leave, female	188	190	156
Employees on parental leave, male	349	288	258

Data acquisition for part-time employees by gender started in 2021

Workplace accidents and days lost

GRI 403-9

	2022	2021	2020	2019
Workplace accidents with absence (categories 3 and 4)	63	67	50	83
Fatal workplace accidents (category 5)	0	0	0	0
Accident rate per 1,000 employees (categories 3 and 4)	5.4	6.2	4.8	7.5
Days lost (after accidents categories 3 and 4)	470	820	679	1,226

The accident statistics relate to the total workforce, including temporary agency workers. Exception: The recording of category 3 accidents for temporary agency workers began in 2021. Accidents while commuting are not included and the day of the accident does not count as a day lost. For composition of workforce sizes, see the [GRI Index](#). Contractor accidents are excluded. No accidents in case of mobile working are included. Workplace accidents were corrected for 2021 at the Vancouver site. In contrast to previous years, the accident rate is reported for all reportable accidents (category 3 and 4) as a percentage of the total workforce and temporary workers.

Health rate

	2022	2021	2020
Germany	93.5%	94.9%	94.8%

Employee training

GRI 404-1

	2022	2021	2020
Training days (total)	29,613	21,141	17,717
Training days per employee (Group-wide)	2.6	2.0	1.6
Training days according to employee category per manager	2.9	2.4	2.1
Training days per employee category per employee	2.6	2.0	1.6
Proportion of women in training courses	18.2%	16.0%	16.3%

Data on training days for 2022 exclude the Rzeszów site in Poland due to a lack of data availability in the IT system; the site will be included in the report again starting in 2023.

GRI: 102-8, 301-1, 302-1, 303-3, 303-4, 303-5, 305-1, 305-2, 305-3, 305-7, 306-3, 306-4, 306-5, 401-1, 401-3, 403-9, 405-1

Masthead

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