



TRANSFORMING AVIATION



Sustainability Report

MTU AERO ENGINES AG
BUSINESS YEAR 2022

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 61
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>
			Nonfinancial KPI
			Diversity and inclusion
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	Sustainability strategy and organization
			Compliance
			Climate impact of aircraft engines
			Environmental management
			Diversity and inclusion
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)
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 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			
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103-2, 103-3	7, 8	Management approach	Climate action at production sites
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302-1	7, 8	Energy consumption within the organization	Climate action at production sites
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302-4	7, 8	Reduction of energy consumption	Climate action at production sites
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302-5	8, 9	Reductions in energy requirements of products and services	Climate impact of aircraft engines
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			Spotlight Climate
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Water and effluents (GRI 2018)			
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103-2, 103-3	7, 8	Management approach	Environmental management
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			Conservation of resources
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303-1	7, 8	Interactions with water as a shared resource	Conservation of resources
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303-3	7, 8	Water withdrawal	Conservation of resources
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303-4	7, 8	Water discharge	Conservation of resources
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303-5	7,8	Water consumption	Conservation of resources
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Emissions			
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103-2, 103-3	7-9	Management approach	Environmental management
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			Climate action at production sites
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305-1	7, 8	Direct (Scope 1) greenhouse gas emissions	Climate action at production sites
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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

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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