Sustainability Report 2012
MTU Aero Engines

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www.mtu.de/de/company/sustainability

Glossary
www.mtu.de/de/globals/glossary

UN Global Compact - Communication on Progress MTU Aero Engines
www.unglobalcompact.org/COPs/detail/17657

Global Reporting Initiative (GRI)
www.globalreporting.org/languages/german/Pages/default.aspx

Strategic Research and Innovation Agenda (SRIA)
www.acare4europe.org/SRIA

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Foreword

Egon Behle

Dear readers,

MTU Aero Engines makes a substantial contribution toward sustainable aviation. Our products are changing the way we fly by making aircraft quieter, cleaner and more resource efficient. Having committed to sustainable product development as part of our long-term Clean Air Engine technology program, we have also set specific sustainability targets through 2035. Our aim is to achieve a 30 percent reduction in CO_2 emissions from aircraft engines by that date. Aircraft engines have product life spans of several decades, so sustainability is an issue that we cannot afford to overlook in our line of business. As such, it is one of the core principles underpinning the MTU business model.

As a responsible engine manufacturer, we take it upon ourselves to tackle future economic, ecological and social challenges in good time. The most important trends we face are the increasing volume of air traffic, currently rising at a rate of some five percent a year, and the growing scarcity of resources. Issues such as these are placing greater ecological demands on the aviation industry. The European aviation industry and research community have already pledged to make air traffic more environmentally friendly by committing to a strategic roadmap that sets out targets from now until the year 2050. Our focus on sustainable product development supports these targets.

We make eco-efficient engine products

We have made considerable progress toward our long-term goal. In the year under review, we and our partners have worked together to drive forward development of the Geared Turbofan™, an entirely new aircraft engine. It is now decidedly closer to being a marketable product, as our preparation for certification have been successfully concluded. The Geared Turbofan is due to enter regular service with commercial airlines from 2015 onwards. It is impressively eco-efficient, with 15 percent less CO_2 emissions and half the subjectively perceived noise level of traditional engines. This is in no small part thanks to one of our own innovations, the high-speed low-pressure turbine, for which we have already won two innovation prizes. A landmark product, our contribution to the Geared Turbofan™ represents years of research and preliminary studies by MTU engineers, and considerable financial investment on the part of the company. We are already looking ahead to product targets we aim to achieve by 2035 through new technologies that go beyond current developments.

We protect resources through sustainable value creation

Although our own contribution to sustainability primarily deals with our responsibility for the products we sell, it encompasses far more. The word sustainability itself originates from forestry, where it describes the principle of only felling as many trees as can grow back. For us as a company, sustainability means securing the foundations of our business by thinking ahead and taking action based on the long term, in order to ensure our continuing economic success that goes hand in hand with the prudent use of available resources. This is why sustainability is a company-wide issue that affects all areas of our business. We have also set and committed ourselves to meeting ecological goals for our production as part of the MTU CLAIR-IS program. The aim is to reduce CO_2 emissions at our headquarters in Munich–representing the majority of our production–by 25 percent by the year 2020. We have already managed to save 240,000 tons of CO_2, putting us well on track to meet this target.

We take responsibility for our employees

We want to maintain our position as a technological leader, keenly aware that this means being able to adapt to the needs of those who will be working with us tomorrow. A motivated, qualified, healthy and diverse workforce is the key to success. With this in mind, we place a great deal of importance on occupational health and safety, staff training and development, diversity and equal opportunities within the company. Our long-term human resources policy aims to fulfill these requirements, and is also oriented toward meeting the challenges of demographic change head on; challenges that will make it difficult for us to secure qualified workers in the medium to long term. This preemptive approach has already resulted in tangible successes in 2012: despite an aging workforce, we managed to maintain employee health at a constant level and to persuade more women to join the company. We want to achieve a significant increase in the number of female employees working for the company by 2015.

Reiner Winkler

We seek and encourage dialog

This, our second sustainability report, seeks to further extend the reach of ideas we share with our stakeholders. Dialog only really exists if it is open. We would like this report to make our aims and achievements in sustainability more transparent and more measurable. We will also be gradually integrating our locations outside Germany into future reports. Preparations for a Europe-wide report are already underway. As for the report at hand, we once again decided to focus on our German locations, while covering relevant issues in greater depth. This coverage nevertheless encompasses almost 90 percent of the workforce and the lion's share of value we create.

Sustainability is an open-end process. MTU's management thus pledges to pursue its sustainability targets consistently, and to lead the company with an acute awareness of this responsibility.

We hope you find this report interesting and informative, and that it provides you with many exciting insights into what sustainability means to us, and how we are going about putting it into practice.

Yours

Egon Behle

CEO until December 12, 2013
MTU Aero Engines AG

Yours

Reiner Winkler

Member of the Board of Management,
Chief Financial Officer, HR and IT
CEO from January 1, 2014
MTU Aero Engines AG

Reporting principles

MTU Maintenance Hannover
MTU Maintenance Berlin-Brandenburg

MTU Aero Engines Sustainability Report 2012

This is our second sustainability report, in which we provide information about corporate responsibility (CR) within MTU Aero Engines. The report discusses our CR strategy and goals and the priorities we have set for our sustainability activities. It follows on from our first sustainability report for the year 2011 and supplements information provided through the company's existing reports, such as the annual report, human resources report and the statements we present for individual locations pertaining to environmental issues. Together with the Communication on Progress for the UN Global Compact, which we have published annually since 2012, it supplies important information about corporate responsibility at MTU. We intend to publish a sustainability report regularly and to ensure it includes greater cross-referencing with GRI indicators and UN Global Compact principles in future, making it easier for stakeholders to access CR-relevant information.

Reporting in accordance with GRI

The 2012 Sustainability Report was drawn up in compliance with the Global Reporting Initiative guidelines, GRI G3.1. In our estimation, the report satisfies the requirements for Application Level B. We report on selected indicators from all categories of the guidelines (the charts are marked with the relevant indicators for better attribution) and explain our management approach for the six principle spheres of activity under GRI. For the first time, we have compiled a materiality matrix as a basis for our 2012 CR strategy. The matrix presents the topics relevant to sustainability for MTU and how these are weighted. It serves as the basis for selecting the performance indicators and topics for this report. In addition, we have significantly expanded the scope of the indicators and achieved greater coverage of the respective guidelines. This improves the comparability and transparency of our CR commitments, as does our evaluation of the degree to which indicators have been fulfilled, which we have incorporated in the GRI index for the first time.

MTU Aero Engines headquarters in Munich.

Scope of validity

The reporting period is the 2012 calendar year (January 1 to December 31), which also corresponds to the 2012 financial year for MTU Aero Engines. In order to better organize how information is presented and to provide explanatory context for readers, activities from the previous year are also cited in some cases. The report covers MTU's German locations, which make up the majority of the MTU group. In terms of proportion of the workforce, the report applies to almost 90 percent of the entire workforce.

The three German locations are MTU Aero Engines headquarters in Munich, MTU Maintenance in Hannover and MTU Maintenance Berlin-Brandenburg in Ludwigsfelde near Berlin. MTU maintains two joint ventures in Germany: Pratt & Whitney Customer Service Centre and Aerospace Embedded Solutions. The latter was founded together with Safran in 2012. Neither of the two joint ventures is included in the report, because they do not have any effect on MTU's sustainability performance. Other subsidiaries and joint ventures are located abroad and lie outside the scope of the report for that reason, even though statements concerning German locations can also apply to other subsidiaries.

We want to incrementally broaden out the scope of reporting and achieve Europe-wide coverage with the next sustainability report. It is our objective to expand the scope over the next few years until it encompasses all locations.

Data collection and calculation methods

All data and information was collected by the responsible departments for the reporting period using representative methods. Environmental key figures were collected on a decentralized basis via the environmental management systems at the individual locations and then consolidated centrally in the CR database according to agreed criteria. The HR key figures were collected and evaluated centrally at the headquarters in Munich using an electronic HR management system and then sent to the CR database. All other data was requested from the CR center coordinators in the relevant departments and compiled centrally in the CR database.

External validation of report

As was the case with the first sustainability report, the CR reporting here is not subject to external auditing or validation. The majority of corporate processes that underlie data collection for CR reporting are certified.

www.mtu.de > the company > quality

Further information

The report supplies information about the activities at our German locations and selected GRI indicators and so it is unable to cover the full range of our sustainability work. You can find supplementary information and more detailed analyses online:

www.mtu.de > the company > sustainability
www.mtu.de > the company > quality
www.mtu.de > technology > technologies for the future
www.mtu.de > career
www.mtu.de > Glossary

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 future, and they are associated with risk and uncertainty.

Consequently, the actual future results of MTU Aero Engines may deviate substantially from the expectations and assumptions expressed here for a variety of reasons. MTU Aero Engines assumes no obligation to update the statements contained in this communication.

MTU's next sustainability report is expected to be published in late summer 2015.

Company profile

Airbus A380

Boeing 747-8

Boeing 787

A320neo

MTU Aero Engines

MTU Aero Engines is Germany's leading aero engine manufacturer and, in terms of revenue, one of the main global players in the industry. The company develops, manufactures and sells commercial and military engine modules and components, which are used in airplanes, helicopters and stationary industrial gas turbines. The second major area of business for MTU is the maintenance of commercial engines, where the company is the largest independent service provider in the world in terms of revenue.

All thrust and power classes are represented in MTU's commercial aviation products. Its commercial product range stretches all the way from widebody aircraft like the Airbus A380 or the Boeing 747 to large passenger aircraft like the Airbus A320 family to short-haul aircraft and business jets. In the military sector, MTU is a key player on the national stage as lead industrial partner to the German armed forces for almost all aero engines. In addition, the company contributes important components and systems to all major European military programs, including the engines for the Tornado, the Eurofighter/Typhoon and the A400M military transport aircraft. The company has also stakes in military engines built by GE like the GE38.

Germany's leading engine manufacturer, in close partnership with major players in the business, is developing novel propulsion systems and technologies in all thrust and power categories. MTU is involved in significant research activities at national as well as international levels. All these activities endeavor to make engines quieter, fuel-thriftier and cleaner. Airbus is offering the new geared turbofan engine for its re-engined A320neo; Bombardier has selected it as the exclusive engine to power its new CSeries; Mitsubishi will equip its MRJ with this new type of propulsion system, Irkut has chosen it for its MS-21 and Embraer decided to apply the geared turbofan™ propulsion for its E-Jet family.

Together with its subsidiaries, MTU Aero Engines is represented in all major markets and regions across the globe. The company's headquarters and largest location is Munich. The largest plant for maintenance is MTU Maintenance Hannover, which looks after mid-sized and large commercial engines as well as providing services such as customer training and a 24-hour service. The company is one of the few maintenance providers worldwide licensed for full repair capability of the largest engine in the world, the GE90. MTU Mainte-

Facts and key figures at a glance (Valid as of December 31, 2012)

Legal form and ownership structure	MTU Aero Engines Holding AG Stock corporation (Aktiengesellschaft, AG) organized under German law. The company is listed in the MDAX stock index. As of December 31, 2012, MTU held 2.4 percent treasury stock. Consequently, the free float (as defined by the German Stock Exchange) accounted for 97.6 % of MTU shareholdings. Institutional investors held about 91 % of the shares, while some 7 % were held by retail investors. All voting right notifications as required under §25 Para. 1 German Securities Trading Act (WpHG) are available at: www.mtu.de/de/investorrelations/mtu_share/shareholder_structure
Headquarters	Munich/Germany
Board of Management	Egon W. Behle (Chief Executive Officer) Reiner Winkler (Chief Financial Officer and Director of Labor Relations) Dr. Rainer Martens (Chief Operating Officer) Dr. Stefan Weingartner (President Commercial Maintenance)
Supervisory Board	The Supervisory Board consists of six shareholder representatives and six employee representatives presided over by Klaus Eberhardt. The Supervisory Board oversees the work of the Board of Management and provides advisory support.
Employees	8,541
Revenue	EUR 3,378.6 million
Total assets	EUR 4,261.9 million
Equity	EUR 1,089.3 million

nance Berlin-Brandenburg, on the other hand, is specialized in small engines and industrial gas turbines.

In the fast-growing Asian market, MTU has teamed up with joint venture partners in two different countries: MTU Maintenance Zhuhai is a joint venture with China Southern Airlines, the country's largest airline. Airfoil Services in Malaysia is a joint venture with Lufthansa Technik and repairs low-pressure turbine blades and high-pressure compressor blades.

MTU has three affiliates in North America, the world's biggest engine market: MTU Aero Engines North America in Rocky Hill, Connecticut develops components, modules, and maintenance techniques. MTU Maintenance Canada operates from the west coast of Canada. And MTU's third American subsidiary, Vericor Power Systems, markets, sells and maintains marine and industrial gas turbines from its base in Atlanta, Georgia.

MTU Aero Engines Polska located in Rzeszów in the southeast of Poland focuses on the development and production of rotor and stator airfoils for low-pressure turbines, assembly work on low-pressure turbines, and parts repair.

www.mtu.de

Eurofighter/Typhoon

Airbus A400M

Eurocopter Tiger

Sikorsky CH53K

"We create values–and are clear in our minds as to how to go about it. We want to grow in a way that is both profitable and sustainable, and will commit our funds and our resources responsibly to achieve this goal."

Claudia Heinle

Corporate Responsibility Coordinator from the Investor Relations Team, Munich

1 Sustainable management

1.1 Management approach

Aircraft engines have a lifespan of several decades. By the time they are approved by the aviation authorities, extensive engineering and testing work will have gone into their development, guided by a business model that must take a long-term view of the large up-front investments involved. MTU currently has a major stake in eight new engine programs. The preparations now underway for the ramp-up of series production for these eight programs are in principle based on our manufacturing and product strategy. As an engine manufacturer, we have to think and decide on what we are going to do well in advance: sustainable management is essential.

Sustainability secures our business success and future viability. Not only does sustainable management help us to remain competitive in a market driven by long-term strategies and decision-making, it also allows us to exploit new business opportunities, minimize risks and develop an early response to economic, environmental and social challenges. Whether we are dealing with scarcity of resources or demographic change, as a technology company with global operations, we are conscious of our responsibility to balance a variety of economic, environmental and social imperatives.

Sustainability as a guiding principle
To secure our future, we have drawn up the MTU Principles as a universal standard and implemented them throughout the company. In the Principles, we explicitly state our intention to shape the future of aviation and we have set out what is important to us in achieving this goal. The Principles are an essential part of MTU's corporate culture and play an important role in guiding our everyday interactions. The MTU Principles are based on five pillars:

- Products, Technology and Growth
- Cooperation and Conduct
- Staff and Management
- Partners, Customers and Shareholders
- Environment and Society

Each of the five pillars is assigned principles in turn, which are binding for all employees at MTU locations worldwide. Values such as responsibility, a spirit of open and trustful cooperation, diversity and mutual respect and appreciation are elaborated in these principles.

Sustainable and responsible behavior must be guided by ethical principles we feel bound to adhere to and have embedded in our organization to ensure they are observed. Of fundamental importance to us is the need to safeguard human rights, observe labor laws, maintain fair working conditions and high health and safety standards at work, prevent corruption and ensure employees have suitable qualifications. Enforcing these principles is a binding Code of Conduct for all employees, managers and board members throughout the company. Anyone who suspects that improper conduct is taking place can pass on their concerns in confidence to an ombudsman. MTU pursues and takes appropriate action against infringements of the Code of Conduct or applicable laws and regulations.

You can find the Code of Conduct here:
www.mtu.de > the company > sustainability

MTU respects the human rights proclaimed in the United Nations' Universal Declaration and ensures that they are safeguarded within the company. MTU is committed to respecting the individuality and dignity of all, maintaining equality of opportunity in recruitment and preventing discrimination. We support the equal treatment of men and women. As the employer of around 8,500 people worldwide, we seek to have the highest possible occupational health and safety standards in our workplaces. Our health and safety programs are certified to OHSAS 18001 at all our German locations.

We are a participant in the UN Global Compact
This longstanding commitment accords with the UN Global Compact's ten principles promoting human rights, the environment and fair working conditions and combating corruption. MTU joined this global U.N. sustainability initiative in 2011, whereby we undertook to observe and implement these internationally proclaimed standards and report annually about the progress we have made.

Communication on Progress
www.mtu.de > The company > sustainability

MTU considers the risk of human rights violations occurring in the company's business operations at its German locations to be low, because they are governed by the provisions of German law, which vouchsafe human rights.

Success

2012 was the most successful business year in MTU's history.

In the reporting year, there were no complaints relating to a human rights infringement. Our Code of Conduct requires us to comply with the applicable laws and regulations at all MTU locations, and that includes safeguarding human rights.

Above all else, responsible corporate governance means observing applicable laws and regulations and steadfastly rejecting corruption and other illegal activities. A proactive Compliance Board seeks to prevent such behavior before it occurs. It also looks into potentially suspicious cases and conducts a fuller investigation to clear them up where necessary.
> For more on corporate governance and compliance, see p. 17.

We expect our suppliers to observe comparable guidelines as the basis for a lasting business relationship with them.

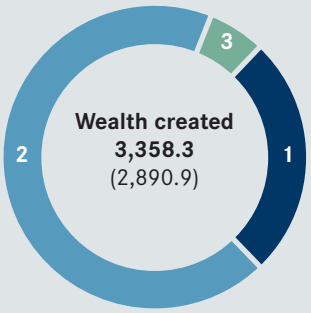
Sustainable value creation
We believe in sustainable value creation. The MTU Principles contain the following statement: "We create sustainable value for our customers, partners and shareholders." We translate this aspiration into concrete targets by means of the corporate objectives we set ourselves for each new business year. We are guided here by our overarching growth strategy, which we have been pursuing for some years now. It explicitly defines our goal to generate a substantial increase in sales by 2020.

We have aligned all areas of our business toward achieving this economic goal. MTU's foundations for growth include:
- Partnerships with big global engine manufacturers
- Investment in future technologies in conjunction with long-term emissions and noise reduction targets
- Participation in attractive forward-looking engine programs
- Balanced product portfolio
- Stable and long-term customer relationships
- Motivated and healthy employees
- Solid positioning in global growth markets

This growth course was clearly confirmed by the company's performance in the reporting year 2012: the business year was the most successful in MTU's history. We continue to exploit market opportunities and build on our good market position. According to our current forecast (as of July 2013), we are set to achieve a growth in sales of ten percent in 2013.

Value added in 2012 (in million euros)
(figures for previous year in brackets)
EC1

1 Net value added	862.8	(792.8)
2 Material costs/ Other expenditure	2,291.7	(1,962.7)
3 Depreciation	203.8	(135.4)



Breakdown of where value added went
(figures for previous year in brackets)

67.8 %	**Employees** (68.8 %)
0.7 %	**Creditors** (2.1 %)
11.4 %	**Exchequer** (9.1 %)
7.9 %	**Shareholders** (7.7 %)
12.2 %	**MTU Group** (12.3 %)

MTU Aero Engines' net value added rose to 862.8 million euros in 2012. The lion's share of 67.8 percent goes to employees.

Geared Turbofan in new Bombardier CSeries at its successful maiden flight.

Exploiting opportunities, minimizing risks
Opportunity and risk management procedures are anchored in the company across all organizational structures in accordance with the leading international COSO II ERM Framework. We see this as a key basis for our continued success and for ensuring values-based management and oversight of the organization.
> For more on risk management, see p. 16.

Innovation gives us the edge
Innovation is one of MTU's strategic pillars and eco-efficiency is a primary focus when we develop new products and technologies. Our policy for technology development dictates that each new engine we help to develop is more efficient–and therefore has lower emissions–and quieter than its predecessor model. Here we are pursuing concrete, long-term goals, which we have summarized in an overarching technology program: Clean Air Engine (or Claire for short) is based on the specifications of the Strategic Research and Innovation Agenda (SRIA) of the European aviation industry and research community.

Innovative products in our core competencies –high-pressure compressors, low-pressure turbines and repair and manufacturing techniques–are an important means of achieving MTU's ambitious growth objective for 2020. As a technology leader in the industry, MTU holds an unassailable reputation for high-tech in aviation. With great determination and persistence, we developed our high-speed low-pressure turbine to operational maturity. The turbine is the key component in the new Geared Turbofan™ and a unique selling point for MTU: no other company in the world has mastered this technology. The Geared Turbofan, which we make together with our partner Pratt & Whitney, is currently the most important product in our portfolio. It has been selected for six aircraft platforms and makes flying significantly more fuel-efficient, lower in emissions and quieter. We are already working on developing the technology further, as the overwhelming market success of this green engine has confirmed that we are on the right track with our innovation strategy. It, too, demonstrates that sustainable management is a core component of commercial success.
> To find out more about the Geared Turbofan see p. 26.

An overview of our responsibilities and management systems:

- MTU Principles
- Ten principles of the UN Global Compact
- Company-wide Code of Conduct
- Occupational health and safety standards in accordance with OHSAS 18001
- Risk and opportunity management in accordance with COSO II ERM Framework
- German Corporate Governance Code

Sustainability management

Our CR management ensures a uniform approach and implementation throughout MTU.

1.2 Sustainability strategy

Sustainability is becoming increasingly important for companies not only as a means to ensure commercial success, but also in terms of public perception. In light of this fact, a growing amount of information is made available to underscore our responsible and sustainable conduct of business, and we have introduced a corporate responsibility (CR) management policy that is now incorporated into our organizational systems.

A CR Steering Committee is responsible for implementing the sustainability strategy and objectives. It reports directly to the Board of Management, which determines the sustainability strategy. The CR Steering Committee is made up of our Senior Vice President Corporate Communications and Public Affairs and our Senior Vice President Corporate Quality. Implementation of the sustainability strategy is overseen by the CR Coordination office, which is assigned to Corporate Communications and is also responsible for producing sustainability publications. The CR Divisional Coordinators play an important role in implementing CR measures in their divisions and make a significant contribution to designing and further developing MTU's CR strategy. They also monitor the success of the objectives that have been set. This ensures a uniform approach and implementation throughout MTU.

MTU's CR management system

Steering Committee's role

All relevant CR data and information is compiled by the CR Divisional Coordinators and sent to CR Coordination. Construction of an integrated database for collecting, verifying and evaluating CR indicators and information was successfully completed in 2012. The database is an important tool which has professionalized our CR work and facilitated stronger monitoring of our sustainability performance. In addition, the CR coordinators act as ambassadors within the company. MTU reports internally and externally on the progress of sustainability activities on a regular basis in order to create greater transparency and to boost awareness of corporate responsibility issues among employees, customers, partners, suppliers and shareholders.

Eco-efficient engine: Geared Turbofan in new Bombardier CSeries before its maiden flight.

1.3 Materiality matrix

Which sustainability issues are important for us? What is their relevance for stakeholders? As part of a materiality analysis, the CR Steering Committee worked with the strategy department and CR coordinators to compile our first materiality matrix, which shows the weighting given to the individual CR spheres of activity. This ultimately resulted in 19 relevant sustainability topics. The majority of topics shows the same relevance for both sides. Both consider product safety, eco-efficient engines, innovation and long-term economic success to be of high priority. By contrast, the social topics of charitable donations/sponsoring and demographic change are deemed to have medium relevance. The weighting values given in the matrix are reflected in our selection of topics and indicators for this report. From now on, the materiality matrix will be regularly reviewed and will become a permanent feature of CR management.

> For more information on the relevant stakeholder groups and the active communication platforms, see p. 18.

Materiality matrix: identifying important sustainability topics

Opportunities

For MTU, climate protection is an important driver of innovation in the market. Our products reduce emissions and flight noise.

Our sustainable business relationships are based on compliance with laws and regulations.

1.4 Risk management

MTU regularly analyzes and evaluates the risks and opportunities arising from its business activities. This work is based on an integrated opportunity and risk management system that is established throughout MTU and forms part of our value creation strategy. It ensures compliance with legal requirements and is designed around the leading international COSO II ERM Framework. MTU's system was rated highly in a benchmark comparison.

MTU's systematic analysis of the principle risk factors means that we identify potential risks early, are aware of their effects and are able to respond to them with suitable management tools. We know our strengths and weaknesses and the opportunities they present.

We consider the following to be crucial factors for successful risk management

- Management style and philosophy
- Integrity and ethical values
- Employee qualification

Under the "Staff and Management" heading, the MTU Principles formulates the following principle for a no-blame culture within the company: "We capitalize on opportunities, assess risks and deal constructively with mistakes made." In 2011, we intensified our efforts to create a no-blame culture by making it our priority for that year and launching a comprehensive rollout. As of the end of the 2012 reporting year, over 5,000 members of staff and management at MTU's German locations have taken part in corresponding training courses.

These efforts are designed to promote an open attitude to weaknesses and enshrine a no-blame culture as the basis for successful risk management. The company's constant striving for improvement is reinforced by our CIP (Continuous Improvement Program) structures.

Risk and opportunity management incorporates sustainability aspects, because CR issues such as product responsibility, the environment and compliance play a role when analyzing potential risks and opportunities.
> For an assessment of MTU's risk situation and an identification of risk factors, see 2012 Annual Report, p. 98ff.

Risks in CR spheres of activity
MTU mitigates the risks of the aviation sector with a long-term business model, a balanced product mix with stakes in various market segments and thrust classes, and a technological edge. Moreover, we regularly analyze the opportunities and risks of climate change. In 2011, for example, the company participated in a workshop on "Long-Term Perspectives for the German Aerospace Industry" organized by the German Aerospace Industries Association (BDLI). In addition, Bauhaus Luftfahrt, a research institution funded by MTU and other partners, has been given the task of carrying out studies into the long-term future of aviation. In 2012, MTU contributed to defining the mobility and fuel strategy of the German Federal Ministry of Transport, Building and Urban Development.

The greatest risks for MTU reside in air transport restrictions because of environmental pollution. Stricter environmental regulations for aviation, on the other hand, present opportunities for MTU, whose products decisively reduce the emissions, fuel consumption and noise of aircraft engines. For us, climate protection is an important driver of innovation in the market. In accordance with the motto of the MTU Principles—"We shape the future of aviation"—our technological developments contribute toward an environmentally sustainable and resource-efficient aviation of the future. These advances are founded on our large investment in research and development, which averaged at around eight percent of sales over the last five years, and selected collaborations with leading scientific institutions.

On top of this, MTU is subject to a large number of environmental laws and regulations. Our use of chemical substances in manufacturing and the emissions from our test benches could see us faced with additional investment costs if the corresponding environmental restrictions are tightened. MTU requires special authorizations for certain production equipment and the associated restrictions and documentation requirements have to be strictly observed. Our environmental management system, which is certified to DIN EN ISO 14001, minimizes these risks.
> For more information on our environmental management system, see p. 35.

Compliance risks exist in all areas of the company. We can define them as the danger of managers or employees failing to observe laws or regulations or violating internal company guidelines. MTU has set up a Compliance Board to minimize these risks. Additional measures include a company-wide Code of Conduct and special training courses teaching employees how to avoid compliance breaches.

1.5 Compliance and corporate governance

We view the observance of applicable laws and regulations as our corporate responsibility toward the public good. We denounce corruption, including bribery and extortion, and all other forms of white-collar crime. MTU acts as a fair business partner and client and advocates transparent competition where all parties are on an equal footing. Integrity and responsible behavior are important values in our corporate culture and are binding for employees, managers and board members by means of corresponding rules in our Code of Conduct.

> For more more on MTU's Code of Conduct, see p. 11.

Prevention is our watchword: once again in 2012, there were no indications of possible corruption at MTU.

Corporate governance

Corporate governance is based on responsible behavior and long-term value creation which is determined by how companies are managed and controlled. Good corporate governance is an integral part of MTU's identity and encompasses all areas of the company. Fundamental aspects of good corporate governance include efficient and trustful cooperation between the Board of Management and Supervisory Board, respecting the interests of shareholders and open and transparent communication with all stakeholders. As a company with global operations, MTU observes national and international standards. In Germany, where MTU has its headquarters, the bulk of these rules are laid down in the Stock Corporation Act, the Co-Determination Act and the German Corporate Governance Code. In MTU's Corporate Governance Report for 2012, the Board of Management and Supervisory Board declared that MTU complied with all recommendations of the German Federal Ministry of Justice's Corporate Governance Code in its current version of May 15, 2012.

> For the full Corporate Governance Report, see the 2012 Annual Report, p. 22ff.

Compliance

Back in 2007, MTU set up a Compliance Board, made up of the heads of the legal department, Corporate Audit and Corporate Security, which is committed to fully clearing up reported suspicions and incidents of irregular behavior. We also regularly inspect all divisions for signs of possible corruption.

In addition, the Compliance Board inspects all consultancy contracts—both new ones and those to be renewed—for potential corruption risks, while the independent organization TRACE also performs a check on consultants. Only once the Compliance Board has delivered a positive recommendation does the CEO give approval to concluding the contract.

Important aspects of the Compliance Board's work are preventing corruption and increasing employees' awareness of possible misconduct. Compliance training courses for all employees are a key tool in this regard, with special courses provided for employees and managers in positions of trust. These training courses are repeated at regular intervals.

Working alongside the central Compliance Board are MTU-wide group officers for individual issues such as data protection. They are responsible for ensuring that special rules and regulations are observed and that there are company-wide standards in place that comply with the applicable statutory regulations.

In addition, internal auditors regularly carry out compliance audits, where they check business processes and procedures for compliance with the law and observation of internal guidelines.

An ombudsman acts as a confidential contact person for reporting suspicions of corruption. Moreover, corruption-related risks in organizational units and risk minimization measures are regularly identified and evaluated through MTU's risk management system.

We play by the rules

Our company-wide initiatives to promote the observance of ethical principles are bearing fruit. In the reporting period, there were no indications of possible corruption at MTU. Furthermore, no significant fines were imposed on MTU, nor are any penalty proceedings pending.

The success of our efforts was validated by the independent organization Transparency International, who assessed MTU in 2012 and rated us as "good".

Since 2011, MTU has further underscored its commitment to management probity through its membership of the AeroSpace and Defence Industries Association of Europe and recognition of the association's standards in relation to corruption, bribery and unfair competition.

Management responsibility

We regularly inspect all company divisions for possible cases of corruption.

Follow MTU

Since 2012, we have been on Facebook, Xing and YouTube.

We are engaged in continuous dialog with our stakeholders across a variety of platforms.

1.6 Stakeholder dialog

MTU maintains open and trustful dialog with its stakeholders. We are in regular contact with the following stakeholders groups: shareholders, investors, financial analysts, employees, our potential future workforce, works councils, union representatives, customers, suppliers, local residents, environmental organizations, scientists, representatives of official agencies, politicians and journalists. Our continuous interaction with these groups allows us to identify the expectations and requirements they have of the company and develop suitable responses. In our dialog with stakeholders, we inform them about sustainability topics and our achievements and goals in this area while also taking up their suggestions and questions. We make a lot of information available on our website

www.mtu.de > the company > sustainability

Since 2012, we have offered stakeholders the option of contacting the employees responsible for CR directly by e-mail corporateresponsibility@mtu.de

We use other platforms as well as the internet, including our intranet site, brochures, flyers, employee and customer magazines, and events such as trade fairs, exhibitions, open days and discussion forums. Our Corporate Communications and Public Affairs department and our Investor Relations department are both in constant dialog with media representatives, politicians and capital market participants. Issues can be raised with and questions put to MTU at the annual general meeting, at Investor and Analyst Days and at various road shows.

MTU carries out regular employee surveys at our three German locations to obtain a snapshot of current opinions on the topics of motivation, management, information, communication, efficiency and continuous improvement. The survey took place again during the reporting period. 76 percent of employees took the opportunity to give their feedback to company management.

> For more on the 2012 employee survey and to see the results, see p. 47.

There is employee representation in place at all German locations, ensuring worker participation. Company management is in regular and open dialog with Works Council representatives.

MTU appears at major industry events such as the Paris Air Show.

Social media

MTU has also been represented on social media platforms since the summer of 2012. The company's strong position on the labor market is based in no small part on its ability to respond flexibly to changes, whether in the expectations of applicants or in the media they use. With its presence on YouTube, Facebook and the recruitment platform Xing, MTU is creating a closer relationship to its target groups and showing its openness to receiving questions and new ideas. In presenting careers information on these platforms, MTU is pursuing several objectives at the same time: as well as familiarizing more people with the company and the activities of its various locations, it is also reinforcing employer branding and enabling job applicants to swiftly establish direct contact with the relevant human resources officers. Typical content includes interviews with current employees, journalistic reports, information on job vacancies and corporate events, and video clips illustrating the advantages of working for MTU. We also use social media platforms to make sustainability topics accessible to a wider audience. MTU has around 3,000 followers on social networks (as of summer 2013). There are plans to establish a presence on LinkedIn as a further powerful international platform.

Political dialog
The German aviation industry is greatly affected by political decisions at national, European and international levels. This makes it important for companies in our sector to appropriately pursue their interests in the political-administrative sphere. Relevant stakeholder groups for MTU include national and international political representatives; diplomatic missions; ministries at state, federal and EU levels; government agencies; national and international customers; future customers; business, science and research representatives; and the press. MTU keeps an office in Berlin for the purposes of advocacy and maintaining continuous dialog with politics and administrative bodies.

Our activities in this area are carried out in accordance with applicable laws and guidelines and the MTU Code of Conduct and are fundamentally non-party-political in nature. We do not support any political party through financial donations. Our work to inform political opinion is carried out via membership of associations, which we use to establish sustainable trends in aviation. MTU is deeply engaged in developing the environmentally friendly technologies of the future. One example of this is the Bauhaus Luftfahrt institution, which MTU founded together with the Free State of Bavaria, EADS and Liebherr Aerospace to research the aviation of the future.

1.7 Memberships

A selection:
- Algae Biomass Organization (ABO)
- Association of German Engineers (VDI)
- Aviation Initiative for Renewable Energy in Germany e.V. (aireg)
- Bauhaus Luftfahrt e.V.
- Bayerischer Unternehmensverband Metall und Elektro e.V. (bayme vbm) (employers' association for the metal and electrical industries in Bavaria—not subject to collective agreement)
- Chamber of Commerce and Industry for Munich and Upper Bavaria
- Deutsches Verkehrsforum e.V. (industry association for all modes of transport)
- European Aerospace Quality Group
- Federation of German Security and Defence Industries (BDSV)
- Forum Luft- und Raumfahrt e.V. (forum for the aerospace industry)
- Friends and Sponsors of the Deutsches Museum
- German Aerospace Center (DLR)
- German Aerospace Industries Association (BDLI)
- German Association of Environmental Management
- German Society for Aeronautics and Astronautics (DGLR)
- IATA Strategic Partnerships
- Münchner Bildungsforum e.V. (Munich-based network for employee training and HR development)
- UN Global Compact
- Vereinigung der Bayerischen Wirtschaft e.V. (Bavarian business association)
- Verband der Bayerischen Metall- und Elektroindustrie e.V. (employers' association for the metal and electrical industries in Bavaria—subject to collective agreement)

Key stakeholders

“We have big plans because we want our products to make flying more eco-friendly: quieter, cleaner and more fuel-efficient. The Geared Turbofan has been a resounding success in this regard but we know there’s more we can do. We’re already researching into new technologies and propulsion alternatives for tomorrow’s air transportation.”

Dr. Jörg Sieber

Specialist Coordinator for Corporate Responsibility and in charge of Innovation Management at MTU

2 Product responsibility

2.1 Management approach

MTU's guiding vision is to shape the future of aviation in a sustainable way. As Germany's leading engine manufacturer, we are keenly aware of the extent of our product responsibility. Our core competencies lie in low-pressure turbines and high-pressure compressors—both key components of aero engines. Developing, manufacturing and maintaining these parts is the core of our business. For MTU, product responsibility is first and foremost about developing new engine concepts and technologies that not only meet the most rigorous demands of quality and safety, but also prove themselves equal to increasingly demanding environmental requirements. Our products work efficiently and to the most stringent safety standards; they are manufactured using safe processes that protect the environment to the greatest possible extent. The same applies to our maintenance services. MTU's agenda of key relevant sustainability topics bears testimony to the prominent role the company and its stakeholders assign to eco-efficient engines and product safety.

We are a driver of innovation in the industry
Global air traffic is increasing year upon year. The consensus among forecasters is that the number of passengers will rise by an average of five percent a year until the end of the decade. Increased mobility across the world coupled with dwindling resources presents the aerospace industry with tough challenges. Sustainable solutions for the future are needed to minimize the impact of this growth on our environment. By developing cleaner, quieter and more efficient engines, MTU can make a crucial contribution to solving the problem. The timespan through which aircraft and engines are produced and in service—more than 25 years in both instances—oblige us to take a long-term view of our products. Eco-efficiency is one of the main pillars of our corporate strategy.

Here, the European aviation sector and research community have agreed fixed climate and environmental protection targets. MTU views the targets set out in this Strategic Research and Innovation Agenda (SRIA) for the years up to 2050 as binding, and the company is doing all it can to support the agenda's objectives in its product development. We have correspondingly put in place a long-term technology program that pulls together all our research and development work on sustainable engine concepts. In the Clean Air Engine (Claire) program, we are working to achieve a 30 percent reduction in CO_2 emissions in commercial aircraft by 2035. A first step in that direction will soon become a reality when the Geared Turbofan enters the market—a completely new product, and a program in which MTU makes a substantial contribution. This pioneering technology is now set to significantly reduce the impact flying has on our environment. We are putting considerable resources and money into developing the Geared Turbofan and reducing its environmental impact still further.
> For more on MTU's Claire program, see p. 28.
> For more on the Geared Turbofan, see p. 26.

MTU has always viewed improving efficiency and reducing noise as important guidelines in its research work. As a result, it is not just the products now under development that display eco credentials. All of our components are characterized by an extremely high level of efficiency—and these are the products that enable new, more efficient engine concepts such as the Geared Turbofan in the first place. Ultimately, the more efficiently an aero engine operates, the lower its level of harmful emissions. Our engineers actively pursue noise reduction as a further important objective in their development activities.

Our products enjoy a worldwide reputation
MTU demands the best quality from its products, services and suppliers. MTU's low-pressure turbines are among the finest in the world. High-pressure compressors are another area of expertise, and offer unmatched technology. This highly prized product quality has made us the partner of choice amongst original equipment manufacturers (OEM) in the aero-engine industry throughout the world. We consider the safety and quality of our products to be critically important. Engines have very long service lives, and more than 50 years can pass from the moment an engine concept is born to the time it completes its final flight and is phased out. MTU guarantees consistent quality and safe operation over our products' entire lifecycles. It has all the approvals and certifications required to develop, produce and maintain flight-ready engine parts and modules.

www.mtu.de > the company > quality

We respect our customers' individual requirements, legal and regulatory stipulations and internal demands along the entire value creation chain. We also work constantly to improve and develop our products, processes and services–and this is what guarantees our competitive advantage.

At all of MTU's sites and at each stage of production, close monitoring guarantees rigorous quality standards. Our integrated management system (IMS) makes sure that legal and regulatory stipulations are respected and that responsibilities are clearly assigned within the company. This allows us to guarantee our customers the same level of quality at each MTU site across the world. Official monitoring and internal and external audits make sure that these quality standards are being upheld.
> For more on product safety and quality, see p. 30.

2.2 Efficient engine technologies

Our product portfolio is second to none. We have engine programs in each thrust and performance class, and contribute efficient engine modules to each. Over the past decades aero engines' efficiency has increased by more than 40 percent, and our products have played a significant role in that development. As far as specific fuel consumption is concerned, engines with MTU involvement have always led the way in their respective thrust class. Our components' high level of efficiency has its part to play in this success. Nor does increasing efficiency work solely to the benefit of aircraft operators; it helps our environment, too, since fuel consumption and CO_2 emissions are directly linked.

Efficiency

Aircraft engine efficiency has increased by 40 percent. MTU products have played a decisive role in driving this progress over the past decades

This economical giant whispers rather than roars: the A380 consumes less than three liters of fuel per passenger kilometer and fulfills the most stringent noise standards currently in force with its four GP7000 engines.

Background: the impact of air traffic on the environment

The impact of air traffic on the environment has been well documented, for instance by the Intergovernmental Panel on Climate Change (IPCC). According to the IPCC, air travel contributes to climate change through emissions of CO_2 and NO_x as well as the formation of cirrus clouds. CO_2 emissions have the greatest role to play here, though emissions have been significantly reduced over the past years thanks to modern turbofan engines with increased bypass ratios. Burning kerosene in a combustion chamber releases pollutants such as NOx, CO, unburned hydrocarbons and soot. New combustion chamber and engine concepts can cut down on these harmful substances. Combustion chambers are not one of MTU's core components, and it is not responsible for this element in any commercial engine.

However, emissions of these pollutants can be significantly reduced using a heat-exchanger engine–for which we have already developed necessary technologies–because of the low pressure levels within the engine. Our rule is to participate only in engine programs where the engine's emissions lie significantly beneath the thresholds prescribed by the International Civil Aviation Organization ICAO.

Aircraft-induced vapor trails or cirrus clouds also have an impact on our environment, though scientists do not yet fully understand how the process works. Vapor trails and cirrus clouds can be avoided or at least significantly reduced by choosing an appropriate route or flying at lower altitude.

An A320neo powered by PW1000G engines will emit around 3,300 tons less CO_2 every year than a conventional A320.

Boeing's Dreamliner is significantly quieter and produces lower emissions than its predecessor model.

MTU on board

MTU supplies the low-pressure turbine (LPT) for the GP7000, the engine that powers the Airbus A380. This plane has an average fuel consumption of less than three liters per hundred passenger kilometers. At the beginning of the 1990s average consumption was around the six liter mark. With its high level of efficiency, our low-pressure turbine contributes significantly to the A380's fuel efficiency. The program draws on numerous LPT technologies. With its four GP7000 engines, the mammoth A380 also meets the most stringent ICAO Chapter 4 noise standard.

Boeing's new 787 Dreamliner also incorporates an MTU component–the essential turbine center frame for the airplane's GEnx engines. By using the most up-to-date materials and the latest processing techniques we have significantly reduced the weight of this structural component. The new engine burns 15 percent less fuel than the previous version, meaning that CO_2 emissions are 15 percent lower and the aircraft generates significantly less noise.

However, we also offer upgrades that improve the energy footprint of established engines. Both the V2500 SelectOne and V2500 Select Two are upgraded versions of the V2500 engine for short-haul and medium-haul aircraft. SelectOne cuts fuel consumption by one percent and SelectTwo by a further half a percent, while both engine variants boost time on wing by 20 percent. We have a share of 18 percent in the program and are responsible for the low-pressure turbines, which we have technically optimized in terms of improved environmental ratings.

With the new Geared Turbofan, MTU has maneuvered itself into a position of singular technological advantage in the aviation sector. This one engine significantly reduces the environmental impact of flying and, even in this first generation, cuts fuel consumption and thus CO_2 emissions by 15 percent. In terms of noise emissions, it lies significantly below the limits prescribed by the ICAO's Chapter 4 noise standard.

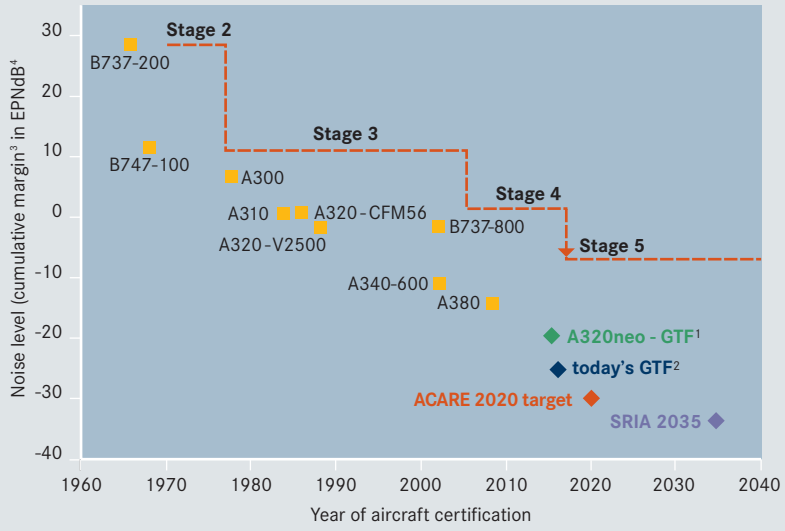
Background: Toward a new generation of “whisper jets”

The noise aircraft produce also contributes to their environmental impact. Engines produce the most noise during takeoff, but the aircraft itself is also a noticeable source of noise because of turbulence generated at the fuselage, wings and landing gear. Most of the noise generated by the engines comes from the fan and airflow. Both the aircraft and its engines must meet noise emissions limits set down by the International Civil Aviation Organization ICAO as part of the certification process. Furthermore, at almost every airport in the world the fees charged for landing and takeoff are dependent on the noise generated by the aircraft. This means it is getting harder and harder to operate noisy planes.

Since the 1960s, aircraft noise has been drastically reduced thanks to engines with higher and higher bypass ratios. Engines in which MTU has an involvement are always among the quietest on the market, coming in significantly below the legally prescribed limits. Both the V2500 for the A320 family and the GP7000 for the A380 represented significant advances when they came onto the market.

The new Geared Turbofan engine concept allows us to go even further. The big, slowly revolving fan cuts down significantly on the noise generated by the engine. MTU’s high-speed low-pressure turbine turns three times faster than a conventional turbine. As a result, it does not generate the low-frequency noise that is so poorly absorbed in the atmosphere. That the Geared Turbofan’s noise carpet is 70 percent smaller is thanks in no small part to MTU’s expertise. And future generations of the Geared Turbofan will be quieter still. Every time MTU redesigns or optimizes an engine, it incorporates measures designed to reduce noise. Our acoustics experts are involved at every stage of product design.

Reduction of aircraft noise (at landing and takeoff)



[1] Existing A320 design with GTF
[2] All-new aircraft design with first generation GTF
[3] The sum of the differences at all three measurement points between the maximum noise level according to the aircraft certificate and the maximum noise level according to the regulations.
[4] Effective Perceived Noise Level in decibels (unit of measurement of aircraft noise used in aircraft certification)

Flight noise

Engines with MTU involvement are well below statutory noise thresholds.

Noise

The Geared Turbofan's noise footprint is 70 percent lower.

Green Engine: The Geared Tubofan.

Our innovations ultimately lead to marketable products

The engine industry is currently setting the pace in the development of eco-friendly technologies for aerospace applications. One need look no further to confirm this than the great market success of the Geared Turbofan, which has established itself with aircraft manufacturers and airlines in an extremely short space of time. The Geared Turbofan sets pioneering standards in the area of eco-friendly technology. A trademark application of Pratt & Whitney, the Geared Turbofan draws on a completely new engine architecture that sets a milestone in engine development. A reduction gear unit decouples the low-pressure turbine from the fan, whereas previously they were both rigidly connected to a single shaft. This enables the big fan to rotate more slowly, yielding a high bypass ratio while retaining a high degree of fan efficiency. The low-pressure turbine, on the other hand, can now rotate at a higher speed at a very high level of efficiency, while the low number of stages reduces weight. As a result, the first generation of the Geared Turbofan–the PW1000G engine family–will be 15 percent more economical. Furthermore, noise emissions come in at 20dB beneath the limit set down in the most stringent Chapter 4 noise standard. This means perceived noise has been roughly halved.

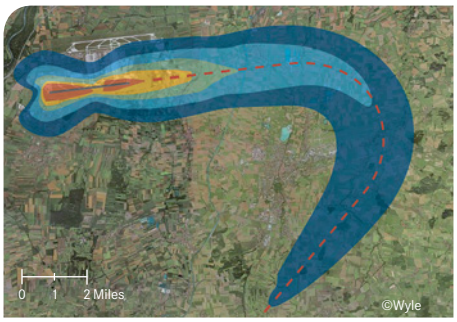
In collaboration with its partners, MTU has taken the Geared Turbofan as the basis of a whole family of engines for use in aircraft of all sizes. MTU is responsible for the key component, the high-speed low-pressure turbine, as well as essential stages of the high-pressure compressor and brush seals.

The Geared Turbofan has also found approval on the market. Five prominent aircraft manufacturers have opted for the PW1000G engine for their short-haul and medium-haul aircraft, with some offering the Geared Turbofan exclusively. Airlines ordering new aircraft are also opting for the Geared Turbofan in large numbers. There are currently already 4,500 Geared Turbofan engines on order. MTU repays this trust with its sustainable attitude toward products and its clear focus on eco-efficient flying–not to mention the significant funding it needs to put up in advance to develop these sorts of products and introduce them onto market.

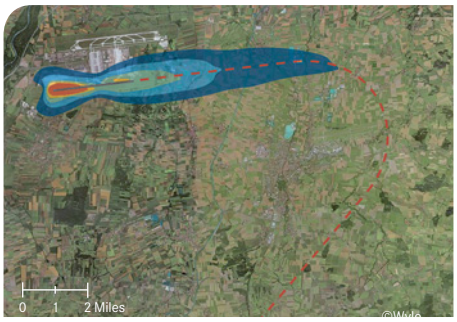
In 2012, the new engine reached some important milestones on its way to entering regular airline operations:

- Maiden flight of the PW1217G for the Mitsubishi regional jet
- Completion of testing for the Bombardier CSeries
- Maiden flight of the PW1133G-JM for the Airbus A320neo

Reduction of 75 dB noise contour due to new geared turbofan technology at Munich airport



Today's aircraft.



Next generation with Geared turbofan engines

SEL Contour (dB)
75 80 85 90 95
Runway
Abatement Flight Track

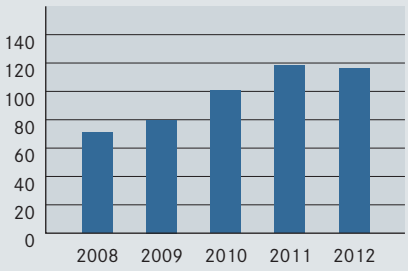
Over 4,000 hours of testing went into the certification of the Geared Turbofan. MTU was heavily involved, using its test rigs to conduct important tests such as endurance, stress, spin and load testing. While this was ongoing, the PW1000G was in flight testing–meeting developers' and engine experts' performance targets with ease in each load test.

2.3 Sustainable product development

As a technology company and a leader in its sector, MTU thrives on innovation. That is why we invest in a broad range of research and development activities. A significant amount of resources here is dedicated to finding new or improved engine technologies. Indeed, over the past five years expenditure on research and development has averaged some 8 percent of turnover. Our mid- and long-term goals for the development of new commercial engines are in line with the Strategic Research and Innovation Agenda (SRIA), a voluntary commitment from the European aviation industry and research community to strive for sustainability in aviation. The commitment to sustainability in product development is also anchored in the MTU Principles: "Our products for the aviation industry burn less fuel and cut down on noise and harmful emissions." This means that each engine with which we are involved is more fuel-efficient than its predecessor, and hence quieter and cleaner, too.

Our system of intellectual property management ensures that we protect our technological expertise. At the end of 2012, the MTU patent portfolio encompassed 3,172 property rights covering various areas of technology, including manufacturing, compressors, turbines, maintenance and engines in general. Each year we lodge some 400 new patent applications.

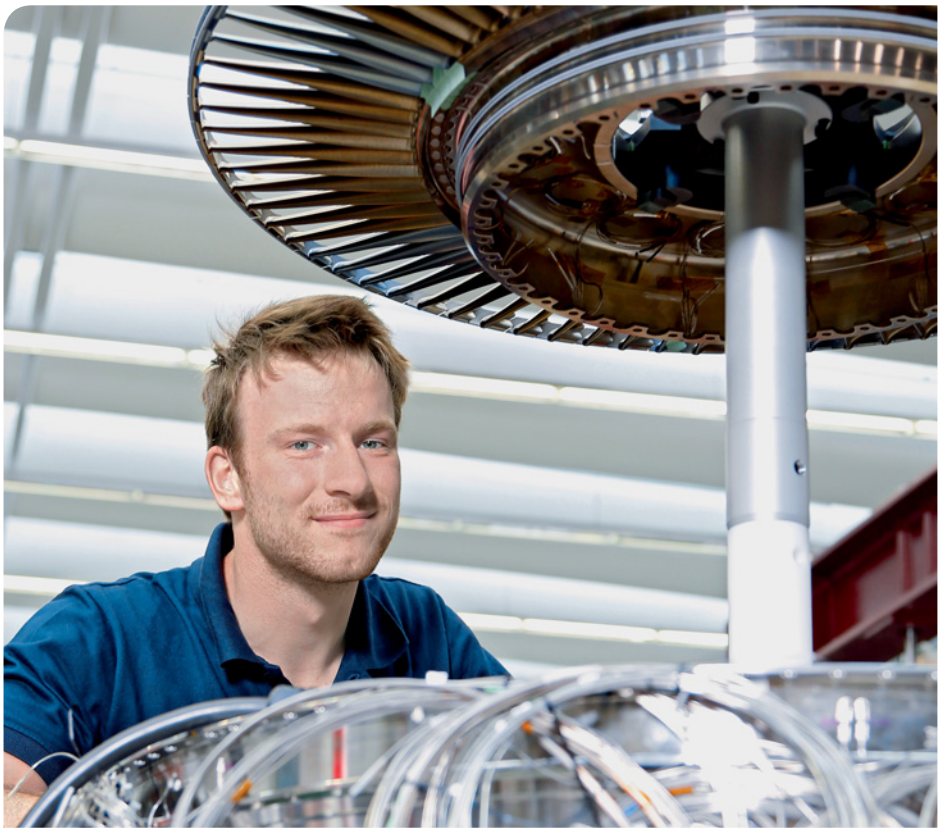
Environment-related expenditure on product and technology development (in millions of euros)
EN 30



New engines must burn less fuel and weigh less, and the majority of expenses incurred in developing new technologies and engine concepts go toward fulfilling these goals. Low fuel consumption coupled with low weight instantly enhances the eco credentials of new MTU products, since both CO_2 emissions and emissions of other harmful pollutants are reduced as a result. Special technology programs and developments focus on reducing noise.

Patents

MTU's intellectual property portfolio comprised 3,172 patents and other industrial property rights at the end of 2012.



For MTU, product responsibility means above all developing new engine concepts. An example of this is the Geared Turbofan, to which we contribute a key component: the high-speed low-pressure turbine.

Carbon dioxide

Our declared goal is for aircraft engines to emit 30 percent less CO_2 by 2035.

We are working on a "Clean Air Engine"
This is the name MTU gives to its long-term technology program for sustainable product development. The European aviation industry and research community have committed themselves to some lofty targets for the future of air traffic and set these down in the new Strategic Research and Innovation Agenda (SRIA). This agenda incorporates the existing ACARE 2020 and Flightpath 2050 objectives and adds in another waypoint for the year 2035.

Here is a breakdown of the SRIA's environmental targets for the aviation sector:

	SRIA 2020	SRIA 2035	SRIA 2050
CO_2	- 43%	- 60%	- 75%
NO_x	- 80%	- 84%	- 90%
Noise		-11 dB = -55%	-15 dB = -65%

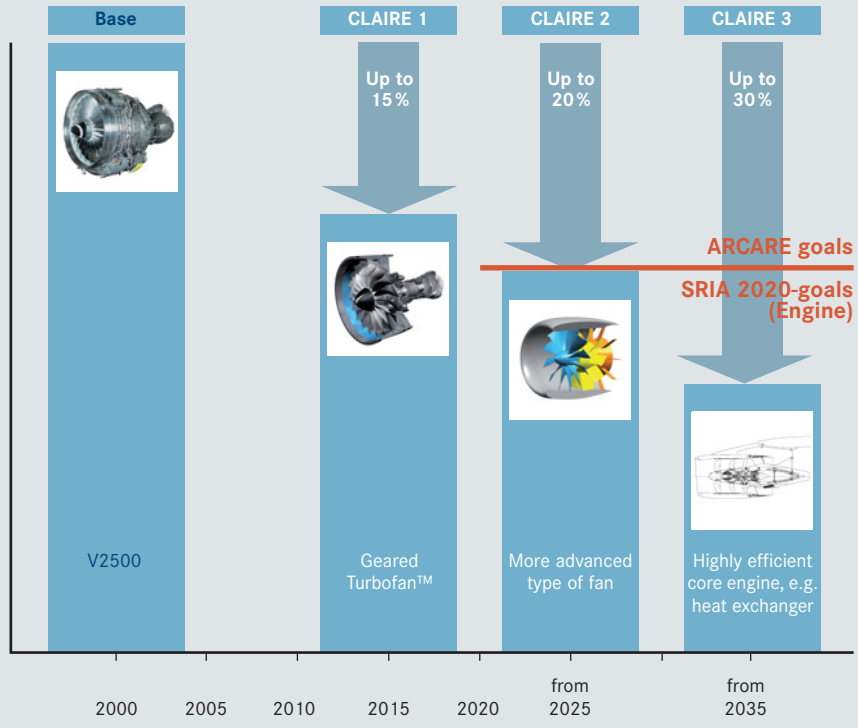
(as against the year 2000 in each case)

No other transportation sector can currently claim to have environmental targets matching the ambition of those set by the aviation sector. If the sector is to make the significant improvements required, it must find innovative ways to develop aircraft, propulsion systems and air traffic control—plus the airlines must also play their part. MTU gauges its performance against the targets set out in the SRIA and has pulled together its research and development activities for sustainable engine concepts under the Clean Air Engine (Claire) program. This defines specific targets for cutting CO_2 emissions and splits them up into three stages leading up to the year 2035: future generations of aircraft engine will have to emit first 15, then 20, and finally 30 percent less CO_2. In developing the Geared Turbofan, which will reach the market from 2015, we have already gone a long way to achieving the engine improvements demanded by the SRIA by 2020:

- CO_2: -20 percent
- NO_x: -80 percent

At the heart of the Claire program is the Geared Turbofan. Its greatly improved energy-efficiency and correspondingly reduced CO_2 emissions have seen us reach our first waypoint on the Claire roadmap. Now MTU is working on ways to develop and improve it. In the second phase of the Claire project, the Geared Turbofan is to receive an improved fan to increase propulsion efficiency. Meanwhile, the third generation of the Geared Turbofan is to be fitted with an improved core engine. Featuring improved thermal efficiency, this will allow the engine to burn even less fuel and will lower its emissions of pollutants still further. Examples of how this will be achieved include a heat exchanger that uses heat energy from the exhaust gas stream to power the turbine.

Planned reduction of CO_2 emissions through MTU's Claire program
EN30



MTU's joint research

Claire is not the only program in which MTU is actively involved. We also play a significant role in national and European research programs. In 2012, we were part of the following large-scale projects that are helping to provide the technologies required for the next generation of engines:

European Union:
- Clean Sky
- Lemcotec
- Dream
- E-Break

The German Federal Ministry of Economics and Technology's national aeronautics research program (LuFo IV):
- Research projects on new compressor and turbine technologies (as such for the turbine "HiSpeeT" and for the compressor "HDV2015")

As part of Clean Sky, Europe's largest aviation technology program, MTU is working on high-pressure compressors and low-pressure turbines for the second generation of the Geared Turbofan. We are also responsible for developing one of five engine demonstrators that are to be built and tested by 2015. Across a range of different power outputs, these five demonstrators will prepare solutions for all sectors of the civil aerospace market. Initial test runs for MTU's GTF-based demonstrator will commence in 2014, and will validate the readiness of the technology behind new, weight-saving designs and materials designed to withstand higher mechanical and thermal loads. Tests will also be carried out on components made of new materials or produced using additive manufacturing methods. Currently, the components are undergoing a comprehensive series of tests in order to prepare them for integration in the demonstrator.

At the end of 2012, the E-break research project was launched. As one of the key partners participating in the project, MTU is helping to address five different issues. The aim is to further develop engine components and systems in order to reduce fuel consumption and CO_2 emissions by some 2 percent and to extend engine service life.

Cooperation arrangements with universities and research institutions form a key component of our research and development activities.

> For more information on our research collaborations, see p. 61.

MTU believes in alternative fuels

Renewable energy sources are necessary in the long run if we want to break free from our dependence on fossil fuels and to continue to limit the impact that air traffic has on the climate. Alternative fuels are not at all widely used in the aviation industry because of the exacting requirements they must meet. Fuels must have a high energy density, a low freezing point and a high flashpoint (for safety reasons). Furthermore, most airports have only a single fuel supply system, so they favor drop-in fuels that have the same properties as conventional kerosene and so can be mixed in with it. Drop-in fuels can be used immediately in existing aircraft, engines and utility infrastructures. Drop-in fuels that are currently approved: synthetic kerosene produced using the Fischer-Tropsch process from coal (CTL), gas (GTL) and biomass (BTL), as well as hydrogenated vegetable oils (HVO). Depending on availability, these could be introduced on a step-by-step basis. While biomass fuels are our only sustainable fuel option for reducing our dependence on fossil sources, we must ensure that producing them in sufficient quantities does not have negative consequences for food production and ecological diversity. A decisive factor will be our ability to select suitable plants and manufacturing processes. A long-term alternative are fuels made by process engineering. MTU is involved in SOLAR-JET, an EU research project that aims to develop the basic principles for producing synthetic kerosene from CO_2 and water using solar energy. Designer fuels that no longer meet today's kerosene specifications, however, require the combustion chamber and the fuel system in the engine to be redesigned.

MTU is committed in a number of different ways to introducing sustainable fuels into the aviation industry, despite the fact that neither sustainable fuel production nor combustion chambers are part of the company's core business. It does so by commissioning studies at Bauhaus Luftfahrt; by being involved in the first practical application of these fuels in regular flights; and by being a member of the Aviation Initiative for Renewable Energy in Germany (aireg). MTU founded aireg in collaboration with airlines, manufacturers and research institutions in order to pool all of Germany's activities and expert knowledge regarding the introduction of alternative fuels. In 2011, MTU helped Lufthansa to use biofuel for their regular scheduled flights for the first time. In 2012, MTU's engine specialists analyzed engines' performance and behavior during test flights and were able to validate the fuel's suitability. There were no operational anomalies compared to using conventional kerosene and, thanks to the higher energy density, consumption (in kilograms per second) even went down.

www.aireg.de
www.bauhaus-luftfahrt.net

MTU is committed to the goal of introducing sustainable fuels in aviation and has supported Lufthansa in carrying out a practical experiment.

2.4. Product quality and safety

Every single MTU product is examined for its impact on health and safety throughout each of its lifecycles, involving development, production and operation. Our aviation products are subject to very strict safety and environmental requirements laid out by the industry's regulatory authorities, conditions that must be met and verified in the early stages of planning new aircraft engines for later use. This includes being able to guarantee safe operation during bird-strike and hail storms, and meeting strict thresholds for pollutant and noise emissions. We have to validate these capabilities using appropriate testing methods. MTU components exceed aviation authority requirements. The manufacture and assembly of engine parts and modules in our production halls fulfills all required standards concerning occupational safety and environmental protection.

Elaborate test procedures ensure the quality of MTU components.

Our products are safe
Comprehensive quality and safety testing is of the utmost importance in manufacturing for the aviation industry. MTU components must meet far-reaching quality specifications before they can be delivered, let alone incorporated into aircraft. Safety critical components are subjected to particularly rigorous testing, for example using costly non-destructive ultrasound and x-ray examination methods. Each component is tested at different testing stations during the course of the production process to check that it is being manufactured in precise accordance with set tolerances. Only once these standards are verified can the component be released for further processing and so accrue more added value. Engine components increase in value throughout the course of their production, which means a lot of capital is tied up in the expensive end product. So manufacturing to the highest quality standards is not merely important for reasons of safety, but also on economic grounds.

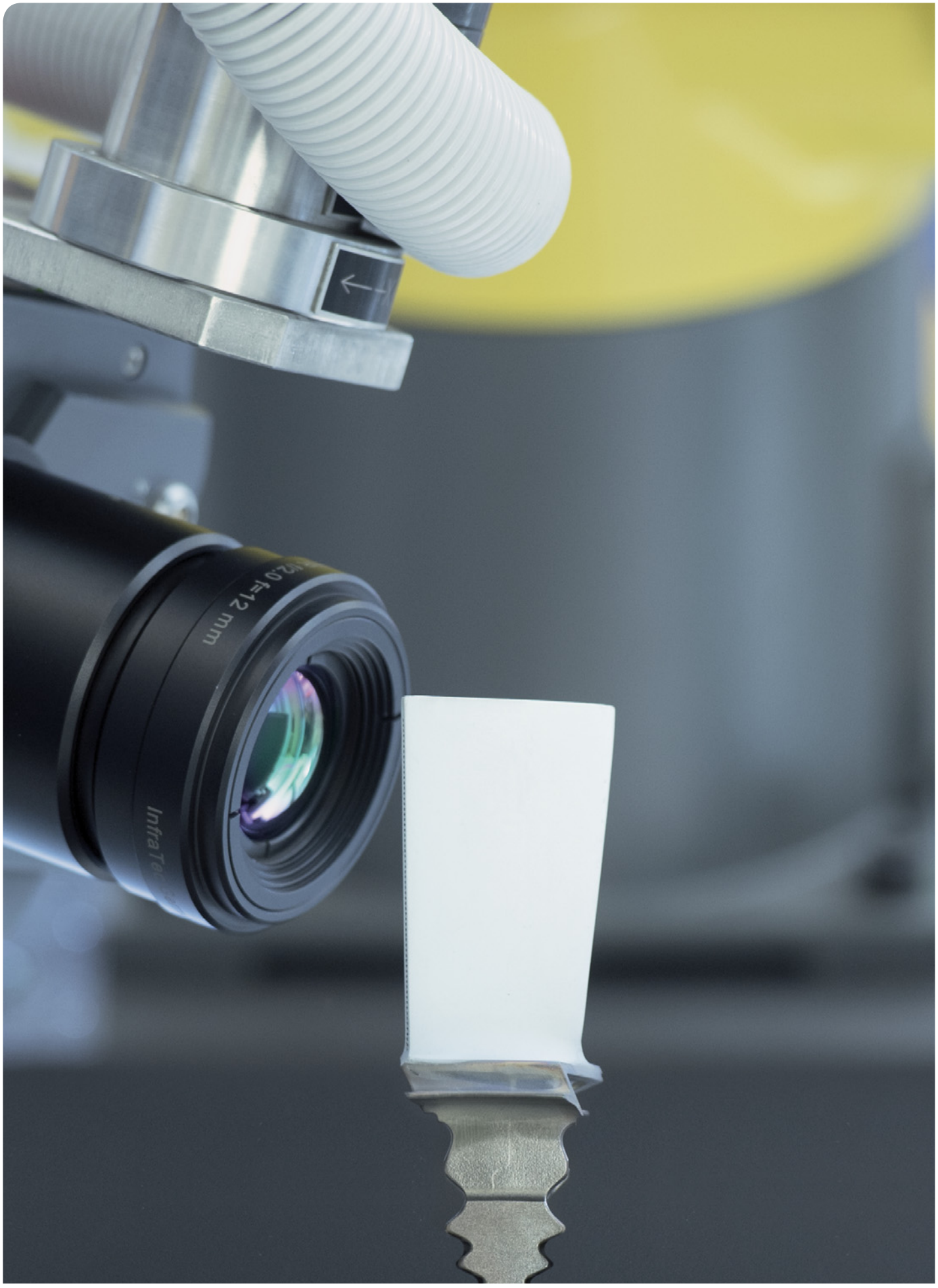
We have equally high quality expectations of our suppliers and their vendor-supplied parts. Each supplier must be approved by MTU, based on an exacting assessment process that we carry out ourselves. We pay site visits to take a close look at the manufacturing process from start to finish, and expect our suppliers to extensively document their activities. We conduct regular audits at our suppliers' locations to check that they are upholding these standards. As soon as any finished and unfinished parts arrive they must pass through our goods inspection department, where we examine them using a variety of different technical methods before releasing them for further processing.

These strict requirements also apply to new materials and technologies, which must also be tested and verified against functionality and safety standards before they can be used in series manufacture. We employ comprehensive testing programs involving test builds and series tests on new engines to verify the safety and airworthiness of our product technologies. All the materials we use must be approved by the appropriate aviation authority.

Fail-safe materials are the basic prerequisite for safe engines and aircraft. MTU joined PICASSO, a European research project successfully completed in 2012, in order to further improve the detection of material tears and material fatigue. The project paves the way for introducing a computer-aided simulation that will enable material to be monitored more quickly and safely.

MTU uses only approved components
Any component used in an engine must receive the appropriate certification. Our principle is that "Safety takes priority in what we do" and that is why we use only properly certified, fault-free and clearly identifiable components. This refers to parts that have been certified by the appropriate aviation authority, are based on approved development documentation and have been produced or overhauled in compliance with the applicable aviation regulatory processes by a company that is authorized to do so and has the supporting documentation to prove it. The aviation sector has strict rules governing documentation requirements in order to verify the airworthiness of components and engines. This documentation must be complete and form an unbroken chain, a principle to which we adhere at each stage of the production process.

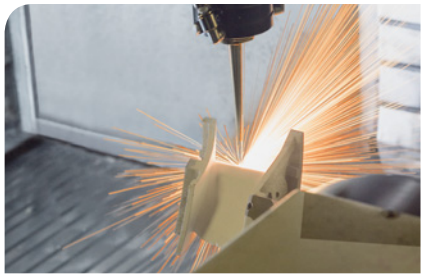
There are also regulations in place governing the handling and storage of documents, data and records. This applies to any documents that contain information on the following: the quality standards met in operations or by products delivered; effective, integrated management systems; the requirements of aviation authorities, partners and customers; and environmental protection and workplace safety. Specific examples of documents that fall under this rule are design reviews, design verifications, supplier assessments, inspection records, records of faulty products and certification documentation for systems or components for which MTU has design responsibility. This allows us to fulfill the requirements of the aviation authorities and of our partners and customers.



MTU has developed a new procedure to inspect tiny holes in blades using a thermographic camera. The advantage of the new method is that water no longer has to be pumped through the system.

Service life

Our technologies extend the service life of life-limited parts by a factor of up to two.



With innovative repair methods, MTU achieves repair depths that are unequalled anywhere in the world.

Our technologies extend service life

Modern engines have a very long service life, equating to some 20,000 cycles (one cycle being one takeoff and one landing). This means that an engine can spend up to 30 years in service. This extremely long service life is one of the design specifications determining engine design, meaning that the service life of each component has to match that of the engine. Components that are subject to extreme heat and high levels of mechanical stress cannot normally be made to last throughout the engine's entire service life, and so these life-limited parts must be replaced in good time. However, by using upgraded materials and design tools as well as improved production and testing techniques, MTU has successfully extended—and in some cases even doubled—the service life of these life-limited parts. Making use of the latest coating techniques to offer protection against erosion, oxidization and sulfidation is also critical to a longer service life. MTU's ERCoateco erosion protection coating for high-pressure compressor blades and vanes extends service life in desert countries such as the Arab states while cutting fuel consumption thanks to wear-resistant blades and vanes. We offer this special coating for the CF6-50, CF6-80 and V2500 engine ranges.

Normally an engine will complete between 20,000 and 30,000 flight hours before it is taken off the wing and has to be given its first overhaul. MTU Maintenance operates a global network that encompasses sites across the world in order to handle these shop visits—engine pit stops, if you will. Each MTU shop is certified according to the ISO 9001 and ISO 14001 standards. MTU Maintenance has developed its own worldwide range of innovative, high-tech repair processes that incomparably deepen the level at which maintenance remains an option. This also helps the environment as it saves on materials and conserves resources. MTU is progressively expanding these repair capabilities, and is investing in research and development work to develop the special processes required.

> Read more about our environmental management in production on p. 35.

As part of its maintenance of aero engines, MTU also offers a special on-wing service known as Engine Trend Monitoring (ETM). This monitors operating parameters to give an idea of how all the components are functioning. The ETM system helps warn of any drop in performance and means that appropriate repair work can be undertaken at an early stage. This makes engines much more efficient in operation and hence better for the environment.

If an engine can no longer be overhauled, it must be disposed of. Nevertheless, the titanium and nickel-based alloys that make up a large part of an aero engine are so valuable that they are almost completely melted down for reuse. For this reason, it would be much more accurate to talk about recycling the engine almost in its entirety, rather than of disposing of it, given that most of the materials are fed back into circulation. Components that have not yet reached the end of their service lives are set aside while the engine is being dismantled and reused as spare parts. Certain materials can also be taken and directly employed in non-aerospace applications.

MTU has developed an anti-erosion coating that extends the service life of compressor blades.

MTU Maintenance's innovative repair methods achieve high levels of material efficiency.

MTU is a reliable supplier and partner
Our definition of product responsibility is not only a question of guaranteeing high quality and safety in our products but about satisfying our customers and partners as well. Customer satisfaction is one of the key yardsticks of a company's success. In 2012, MTU was again awarded the Supplier Gold Award from Pratt & Whitney's parent company United Technologies Corporation (UTC) in recognition of the outstanding quality of its products, its on-time deliveries and a high level of customer satisfaction. Pratt & Whitney is an Original Equipment Manufacturer (OEM) for aero engines and an important partner for MTU, with which it collaborates on many engine programs, including the new Geared Turbofan.

MTU Maintenance is responsible for supplying maintenance services and carrying out maintenance work on aero engines and industrial gas turbines for airlines and energy providers—in other words, its activities involve direct business to end customers. In 2012, the transformation program Response was launched at MTU's biggest maintenance site in Hannover. This program is designed to further improve product quality and customer satisfaction and to embed a sustainable culture of success at the site. To attend to customers' needs even faster and more effectively, the MTU subsidiary has introduced an IT-based customer relationship management system. One important component of the system is the voice of the customer survey, which allows employees to gauge customers' current level of satisfaction with engine maintenance work at MTU Maintenance. The survey is carried out once in a quarter and has been steadily rolled out to include other sites and customer segments. Customers regularly make use of the chance to provide feedback on the quality of our products, services, logistics or commercial aspects. And, in turn, we use the feedback to further improve our performance and to position ourselves even more closely in line with our customers' wishes. Due to the voice of the customer survey we have been able to identify areas in which we can improve and introduce measures to address them. Our goal is to constantly improve levels of customer satisfaction and remain competitive as a result.

In the OEM segment, MTU partners General Electric and Pratt & Whitney/Pratt & Whitney Canada in developing and producing engines for commercial programs. Both of these companies are among the biggest aero engine manufacturers worldwide. In the military segment, MTU develops and produces important systems and components for all the major European programs, as well as being involved in U.S. engine projects. All suppliers and recipients involved in the purchase or sale of engine components are checked by MTU in advance as part of a sanctions list check. Our military customers include the defense ministries of individual customer nations as well as the companies that work with these ministries. Any delivery of military equipment must be cleared by the German federal government to ensure that the buyer and the recipient of the goods are trustworthy. Without this clearance, there can be no delivery or exports of engines and parts for military use.

“Our production operations are sustainable, and we make it our approach to incorporate environmental considerations into company decision-making from the outset. Most often, trying to conserve resources will also turn out to be the more economical option.”

Klaus-Ulrich Lemmer and Dr. Hans-Stefan Niebler

Corporate Responsibility Coordinators in Hannover from Environmental Protection and Quality Management

3 Environmental management in production

Production

We have attained 100 percent environmental management system coverage at our German locations.

3.1 Management approach

MTU places a high value on environmental protection. This is reflected in the MTU Principles, in each year's corporate goals, and in the company's program of environmental measures. We advocate company-wide ecological responsibility not only for our products, but equally in the ways they are developed, manufactured and maintained. Our greatest contribution to environmental protection lies in producing eco-efficient products. MTU takes an active role in numerous technology initiatives and research programs that aim to keep the impact of air travel and transport on the environment to a minimum. The company invests considerable resources into the development of fuel-efficient, lower-emission and quieter engines.
> Read more about our product responsibility on p. 21ff.

Equal importance is attached to cleaner production. The targets we have set ourselves in manufacturing and maintenance activities aim at minimizing pollution from emissions, harmful substances or noise arising from our processes. The Clean Air Industrial Site (CLAIR-IS) program allowed us to slow the rise in electricity consumption at our headquarters while simultaneously reducing CO_2 emissions. We take great care to conserve resources such as water and raw materials, and use energy sparingly: energy-efficient production is a top priority. Although production volume at MTU continues to rise, our consumption of energy remains constant or is rising at a considerably slower rate. Our consistent reuse of waste materials has for many years resulted in high recycling ratios at our Munich, Hannover and Berlin sites, where the bulk of our production takes place. We intend to maintain the standards already achieved in the years ahead, even as production volumes climb. Levels of airborne pollutants released by our plants and test rigs are within the limits described in the relevant permits, as confirmed by documented mandatory measurements.

Environmental protection throughout the company is given top-level management priority through direct reporting to the Board of Management. A certified environmental management system, in which all processes, responsibilities and goals are defined, ensures that consistently high standards are upheld throughout the company. Internal standards corresponding to laws, ordinances, permissions and other regulations are binding for MTU's sites in Germany and in some instances exceed statutory compliance. The stringent environmental criteria apply to all divisions, processes and systems, extending from an engine's development through to its production. These criteria are described and regulated within documented process flows and special standards applying to the company's production units.

MTU's sites in Germany have the following environmental protection management certifications:

Munich:
- EN9100:2008
- ISO 14001:2004
- EMAS Regulation (EC) No. 1221/2009 (Eco Management Audit Scheme)
- OHSAS 18001:2007
- GQA Certificate

Hannover:
- EN9100:2008
- ISO 14001:2004
- EMAS Regulation (EC) No. 1221/2009 (Eco Management Audit Scheme)
- OHSAS 18001:2007

Berlin:
- EN9100:2008
- ISO 14001:2004
- OHSAS 18001:2007

- All certifications were successfully verified in audits in the reporting year.

The environmental protection management officer holds a senior position within the company's organizational structure and is responsible for implementing the environmental management system. Individual managers are directly responsible for environmental protection and are advised and supported in occupational health and environmental protection by their site's relevant specialist departments.

Independent external auditors and environmental consultants conduct annual reviews to confirm adherence to the latest environmental protection requirements. This monitoring is supplemented by internal inspections and audits. In its controlling and monitoring role, MTU's management carries out regular management reviews and directly steers development of the management system.

Our employees play an important role in implementing our environmental management. We demand and support their awareness of the need to protect our environment: "The last to leave turns out the light". An internal information project of the same name at our Hannover site, for example, was launched by the environmental team there to make employees more conscious of how much energy they are consuming. As a member of the Bavarian "Umweltpakt Bayern" initiative our Munich site has committed itself to actively supporting a call that industry in the region take greater responsibility for environmental protection. And since 2010, we have also been a member of an energy efficiency network involving the city of Munich and surrounding Upper Bavaria.

The public are regularly informed about measures, results and successes relating to environmental issues through statements issued by MTU for its Munich and Hannover sites.

www.mtu.de > the company > sustainability > environment

Our major suppliers are actively bound to support our efforts to protect the environment.

Investing in environmental protection

MTU invests a great deal in protecting the environment, since the resources saved through energy-efficient production not only improve environmental compatibility, but also pay dividends in the form of lower energy costs. We invest primarily in modernization, the use of renewable energies, and in new buildings that are planned according to strict environmental criteria. The new manufacturing Hall 077 at our main plant in Munich more than meets the energy standards set out in German legislation.

In the newly-built manufacturing Hall 077, we use only a sixth of the energy used in standard facilities.

Current expenditure for environmental protection in 2012 (EUR million)
EN30

Waste management	493,000
Water pollution control	260,000
Air pollution control	150,000
Conservation and landscape management	97,000
Soil restoration	50,000
Use of renewable energy (CHP operation in Munich)	1,275,00
Total	**2,325,00**

Investments in environmental protection in 2012 (EUR million)
EN30

Energy-efficiency measures	660,000
Water pollution control	277,000
Climate protection (e.g. air conditioning in Hall 077 in Munich)	1,000,000
Emission prevention/reduction	300,00
Total	**2,237,000**

No overall quantification in monetary terms is currently possible.

Green roofs: vegetation on top of buildings improves their insulation.

3.2 Emissions

The Clean Air Industrial Site program (CLAIR-IS) was initiated in 2009 at MTU headquarters in Munich. CLAIR-IS sets climate objectives for manufacturing processes that are similar to the company's Claire (Clean Air Engine) technology project. The long-term aim is to cut CO_2 emissions from product manufacturing and maintenance activities at our main plant in Munich by up to 25 percent by the year 2020 (compared to figures from the year 1990).

Specific measures have been identified to achieve energy-efficient production:

- increase the use of well water as coolant in production processes
- renovate the heating network
- improve heat insulation
- employ systems to regulate building services
- use renewable fuels (vegetable oil as fuel for cogeneration power plant)
- improve the energy efficiency of the compressed-air supply
- employ more energy-efficient lighting systems

State-of-the-art external wall insulation reduces heat loss.

Cooling with well water, for instance, saves around 3,000 tons of CO_2 annually, while using the cogeneration plant can cut CO_2 emissions by as much as 7,400 tons per year. For several years now, modernized ventilation systems featuring the latest rotary heat exchangers have gradually increased the amount of heat retained indoors, providing a significant saving of around 1,500 tons of CO_2 emissions each year. In total, these measures will save around 23,000 tons of CO_2 (greenhouse gas) emissions annually (based on average emissions over the last three years). This equates to an average annual reduction of 1.5 percent.

These measures are also designed to reduce electricity consumption by 25 percent (extending from 2010 through to 2020).

CO_2-emissions by energy source (in tons)
EN 16

	Electricity		Gas		Heating oil		Diesel		Aircraft fuel	
	2012	**2011**	**2012**	**2011**	**2012**	**2011**	**2012**	**2011**	**2012**	**2011**
Berlin	6,000.3	5,771.9	2,034.7	2,585.7	0.0	0.0	4.3	4.2	2,212.5	1,904.8
Hannover	10,985.4	11,154.6	3,358.3	3,020.3	0.0	0.0	16.0	15.9	5,427.8	5,482.9
Munich	33,667.0	34,057.0	11,167.0	10,255.0	34.0	13.0	131.0	127.0	3,015.0	3,541.0
Total	**50,652.7**	**50,983.5**	**16,560.0**	**15,861.0**	**34.0**	**13.0**	**151.3**	**147.1**	**10,655.3**	**10,928.7**

Many MTU processes lead to the production of greenhouse gases that, according to the Kyoto Protocol, have an environmental impact. By far the most emissions are of CO_2. Absolute CO_2 emissions vary according to the distribution of the different types of energy used. Electricity is our main fuel energy source and the largest contributor to CO_2 emissions, the levels of which vary according to production workload.

Other airborne emissions (in tons)
EN 20

	Carbon monoxide CO		Nitrogen oxide No_x		Sulfur dioxide SO_2		Dust	
	2012	**2011**	**2012**	**2011**	**2012**	**2011**	**2012**	**2011**
Berlin	4.69	4.71	14.59	13.86	3.48	3.23	0.18	0.17
Hannover	4.90	2.30	43.50	49.70	0.72	0.70	0.13	0.10
Munich	27,00	26.00	60.00	60.00	19.00	19.00	1.30	1.30
Total	**36.59**	**33.01**	**118.09**	**123.56**	**23.20**	**22.93**	**1.61**	**1.57**

MTU's emissions take the form of exhaust gases from combustion processes and exhaust air from work rooms and processes. Both emission streams contain air pollutants. Many of our production facilities, such as those for metal spraying or electroplating, feature highly efficient emission control systems. This results in very low emissions, making test rigs and heating plants the main producers of air pollutants. Approval for our test rigs and heating plants depends upon our ability to demonstrate compliance with air pollution limits prescribed by law. We provide the relevant authorities with regular measurements that confirm our full compliance.

Logistics

The distance parts travel from the warehouse in Hannover has been reduced by 27,285 kilometers per year.

State-of-the-art technology, such as can be found here at the Hannover location, ensures energy-efficient production.

3.3 Energy management

Constantly monitoring energy consumption at our sites in Germany allows us to see where we can raise efficiency. This goes hand in hand with our concept for sustainable buildings and processes: when we erect new buildings or carry out major refurbishments, we attach great importance to measures that ensure the energy supplied is used efficiently. Our goal is to significantly improve on the values recorded for existing buildings of the same type.

Best practice: New production facility
MTU recently built Hall 077 in Munich to produce high-tech engine components: integrally manufactured blades and disks (blisks). The company invested some 65 million euros in the new building, and directed a portion of those funds towards installations that would make both energy efficiency and economic viability top priorities in the building's design. The entire building is designed to be a low-temperature facility that features cutting-edge ventilation technology and well-water cooling. Any heating energy that is still required is recovered from waste heat generated by air compressors, which is fed to a heat pump, and additionally from waste heat emitted by machinery. By recovering heat in this way, and through the use of additional thermal insulation, the new facility's energy costs are around 60 percent lower than those of similar existing buildings—reducing the building's energy consumption to a sixth of values for existing, standard facilities. The design concept enabled the company to achieve extremely low levels of consumption for resources required by the building. Blisk manufacture began in the new facility at the end of 2012.

Best practice: Improved logistics chain
In 2012, MTU Maintenance in Hannover began construction on a new logistics building. It was completed in mid-2013. The new hall has contributed to improvements in the logistics chain by cutting the distance from the spare-parts warehouse to production from 15 kilometers to a mere 75 meters. The site's logistics processes now consume considerably less resources and result in far fewer emissions. Further work is underway to optimize traffic flows. A solar thermal plant fitted to the roof of the building, used to heat process water, is doing its part to minimize the site's environmental impact. The logistics facility also features underfloor heating powered by surplus waste heat from the compressors used in production.

Further measures taken for production halls and buildings:

Heat recovery: All major production halls in Munich already have heat recovery systems incorporated into their ventilation systems. These extract heat from air ventilation outflows and use it to heat the fresh air flowing into the building. Since several thousand cubic meters of air are circulated per hour, this dramatically reduces the amount of heating required. In 2012 at our Ludwigsfelde site, we modernized the test-rig prefitting facility by upgrading its ventilation system for integrated heat recovery. Similar work in Hannover to harness energy reserves has continued into 2013.

Compressed air generation: Compressed air is one the most important forms of energy used in industrial manufacturing after electrical power. It is generated by modern, energyefficient compressors that significantly reduce electricity consumption and CO_2 emissions. At the Munich site, waste heat from the compressed air generation process is used to heat the water supply to the canteen, and to heat Hall 077. MTU has the compressed air circuit at its sites inspected regularly to ensure that any potential leaks are discovered and repaired.

Lighting technology: When erecting new buildings or carrying out major refurbishments, we ensure that our production halls, offices and floor spaces are illuminated using energy-efficient lighting technology. This is yet another way to save resources: such systems use less electricity and emit less CO_2 while providing lighting that is as good as, and if not better than, previous solutions.

Lower rated thermal input in the heating plant: Boiler 6 in the heating plant at the Munich site was successfully downsized during the reporting period, dropping the heating plant's rated thermal input down to under 50 megawatts. Now that it no longer counts as a large combustion plant, its large boilers are no longer started up several times a day, which was unfavorable from an ecological point of view. This considerably reduces fuel consumption and exhaust emissions.

Energy consumption (in MWh)
EN 3, EN 4

	2012	2011
Berlin	30,595	29,270
Hannover	57,843	56,768
Munich	158,490	152,945
Total	**246,928**	**238,983**

Sustainable construction: the new blisk production facility in Munich has a particularly energy-efficient design thanks to systematic heat recovery, cutting-edge ventilation technology and well-water cooling.

Energy consumption (categorized by energy source, in MWh) 2012
EN 3, EN 4

	Gas		Heating oil		Aircraft fuel		Diesel	
	2012	2011	2012	2011	2012	2011	2012	2011
Berlin	11,308.00	12,019.30	0.00	0.00	8,623.57	6,998.38	0.00	0.00
Hannover	17,448.00	15,898.00	0.00	0.00	20,470.43	20,698.56	0.00	0.00
Munich	55,392.00	50,867.00	126.00	47.02	11,713.00	13,757.20	490.00	474.97
Total	**84,148.00**	**78,784.30**	**126.00**	**47.02**	**40,807.00**	**41,454.14**	**490.00**	**474.97**

	Biodiesel		Palm Oil		Electricity		District heating	
	2012	2011	2012	2011	2012	2011	2012	2011
Berlin	0.00	0.00	0.00	0.00	6,493.00	6,338.00	4,170.00	3,914.00
Hannover	0.00	0.00	0.00	0.00	19,865.00	20,171.00	0.00	0.00
Munich	96.00	54.56	13,631.00	9,811.45	77,042.00	77,933.00	0.00	0.00
Total	**96.00**	**54.56**	**13,631.00**	**9,811.45**	**103,400.00**	**104,442.00**	**4,170.00**	**3,914.00**

Gas, district heating, biodiesel and palm oil are used to heat buildings and water. The demand for heating energy varies considerably according to weather conditions and the severity of the colder times of year. This in turn affects how much electrical energy we consume. Aircraft fuel is essential for performing engine tests; the type and duration of these tests are the only factors affecting how much aircraft fuel is consumed. Our use of green electricity is determined by the extent to which our suppliers either procure or themselves produce electricity from renewable sources. Stadtwerke München, for example, has announced a medium-term goal of supplying its customers with electricity produced exclusively from renewable sources.

We use renewable energy: a solar heat is installed on the roof of the new logistics building in Hannover.

3.4 Water use

MTU has increased the amount of well water used at its Munich headquarters. Groundwater is extracted from MTU's own on-site wells, and used for cooling in production processes. This quaternary water, which is not classed as drinking water, is pumped from a depth of 25 meters and piped throughout the site. Compared to conventional cooling, this method reduces electrical power requirements and avoids the use of environmentally damaging coolants, while also significantly reducing CO_2 emissions. MTU has been gradually expanding its water extraction plants over several years. Developments undertaken in 2012 mean the company can now extract 12.8 million cubic meters of groundwater per year.

Thanks to the systematic use of well water in cooling processes, our Munich site has been able to markedly cut the amount of drinking water it consumes. Drinking water is mainly used in sanitary facilities, in the canteen and, to a lesser degree, in manufacturing. Our consistent efforts to employ water-saving technology and to recirculate process water internally have led to a significant drop in water consumption over the past few years. Process water for electroplating and crack detection facilities is fed into the water recirculation system. Since most of the water is reused, only a small amount of waste water requires treatment before being introduced into the municipal sewer system.

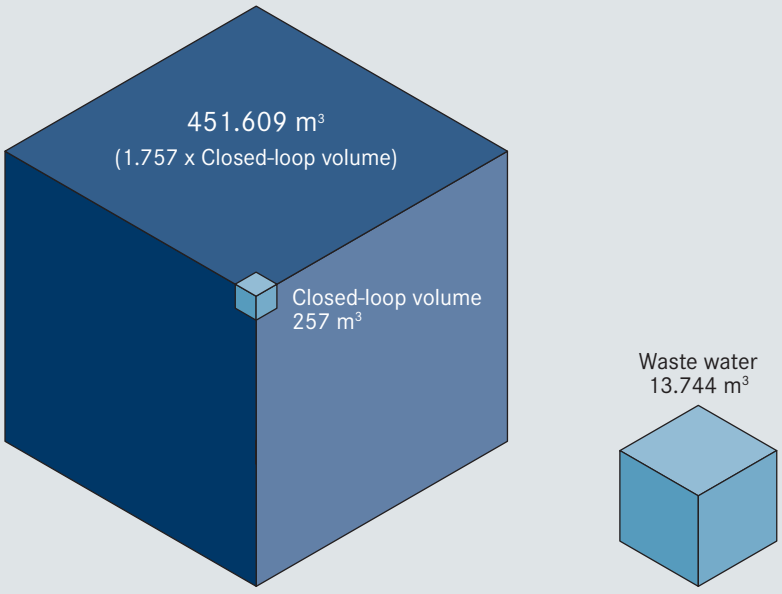
Electricity generated from biomass: cogeneration power plant at our Munich site.

Water management (volume in m³)
EN 8, EN 21

	Drinking water		Waste water		Ground water intake		Ground water discharge	
	2012	**2011**	**2012**	**2011**	**2012**	**2011**	**2012**	**2011**
Berlin	10,214	9,997	9,233	9,038	0	0	0	0
Hannover	47,229	44,221	40,064	36,569	0	0	0	0
Munich	77,000	75,000	150,000	134,000	5,652,000	4,983,000	5,315,000	5,163,000
Total	**134,443**	**129,218**	**199,297**	**179,607**	**5,652,000**	**4,983,000**	**5,315,000**	**5,163,000**

Best practice: Electroplating water circuit

In engine manufacturing, electroplating involves certain coating processes that use water-based chemical process baths. An ion exchange plant is used to create a rinse water circuit that enables large volumes of water to be reused. The entire circuit has a volume of 257 cubic meters. In 2012, 451,609 cubic meters of water were circulated, meaning the full volume was cycled through the system a total of 1,757 times. Electroplating work was carried out on 286 days during 2012, meaning the full volume was circulated and reused 6.5 times a day. Feeding in mains water cancels out any wastage, caused for instance by evaporation. In 2012, only 13,744 cubic meters of waste water were treated and introduced into the municipal sewer system from process baths used in electroplating.



Recycling

In 2012, we achieved a rate of 81.5 percent at our German plants.

We have a sustainable waste disposal policy that attains high recycling rates at our locations.

3.5 Material efficiency

MTU strives to use basic and raw materials economically and efficiently in production. Our manufacturing processes are geared toward efficiency and waste reduction. We aim to avoid the use of environmentally harmful materials wherever possible, both in our manufacturing and repair processes and in our products. This goal is exemplified by the chromium-free paint we use for engine coatings, which was developed in our laboratories. And our use of hazardous materials such as mercury and cadmium was discontinued several years ago.

MTU's high-tech manufacturing and repair processes are second to none. As leaders in this field across the aircraft engine industry, we achieve a depth in engine repair that is unique worldwide. Special techniques we ourselves developed enable us to repair engine parts that other maintenance shops have to replace with new ones. This saves valuable resources as well as materials that would have been used in the manufacture of new parts. We continuously develop our repair expertise and channel considerable investment into research and technology in consistent pursuit of our "repair beats replacement" approach towards identifying the processes required. This is exemplified by a research project launched in 2012 entitled "Significant kerosene reduction and material efficiency improvement in commercial aviation through innovative high-tech maintenance applications." Around 70 percent of all engine blades can already now be reused two, three or even four times.

Waterstripping—or the removal of thermal coatings from engine parts without the use of harmful chemicals—is an established process at MTU. Using water instead of harmful chemicals raises process efficiency in terms of material consumption, workplace safety and waste disposal.

Waste accumulation

We adhere to a sustainable waste disposal concept aimed at recycling the greatest possible proportion of our waste. This dovetails with the EU's new five-tier waste hierarchy, as expressed in Germany's Waste Avoidance, Recycling and Disposal Act (§6 of the Kreislaufwirtschaftsgesetz):

- Avoid the production of waste wherever possible
- Reuse any waste material
- Recover material from waste
- Recover heat from waste
- Eliminate waste.

This approach allows us to achieve a high recycling ratio averaging around 80 percent over recent years. And although production volumes are set to rise—and with them the amount of waste we accumulate—we plan to maintain this level in future.

Material consumption at MTU sites in Germany
EN 1

		2012	2011
Nickel-base alloys	(in tons)	1,732.0	1,979.0
Titanium-base alloys	(in tons)	99.0	121.0
Raw materials, consumables and supplies	(in tons)	5,639.4	6,032.1
Technical gases	(in tons)	2,315.6	2,349.0
Packaging	(items packaged)	278,712.0	325,859.0

Waste management 2011 and 2012 (in tons)
EN 22

Volume of waste (in t) and recycling ratio (in %)

	Total waste reused		Total waste disposed of		Total waste		Recycling ratio in %	
	2012	2011	2012	2011	2012	2011	2012	2011
Berlin	173.56	181.30	74.89	49.90	248.45	231.20	70.0	78.0
Hannover	1,111.71	1,080.31	0.64	1.38	1,112.35	1,081.69	90.6	87.1
Munich	2,607.00	3,008.00	490.00	379.00	3,097.00	3,387.00	84.0	88.9
Total	**3,892.27**	**4,269.61**	**565.53**	**430.28**	**4,457.80**	**4,699.89**		

The drop in waste reused in 2012 is attributable to decrease in the volume of metal available for recycling; the rise in waste disposed of in the same period is a result of a one-off special disposal of cooling lubricants.

Non-harmful waste (in t)

	Non-harmful waste* reused		Non-harmful waste* disposed of		Non-harmful waste total		Non-harmful building waste reused	
	2012	2011	2012	2011	2012	2011	2012	2011
Berlin	162.14	166.50	3.84	1,9	165.98	168.40	0.00	0.00
Hannover	638.83	575.62	0.00	0.0	638.83	568.05	62.30	7.58
Munich	2,193.00	2,508.00	34.00	42.0	2,227.00	2,550.00	0.00	0.00
Total	**2,993.97**	**3,250.12**	**37.84**	**43.9**	**3,031.81**	**3,286.45**	**62.30**	**7.58**

Harmful waste (in t)

	Harmful waste* reused		Harmful waste* disposed of		Harmful waste total	
	2012	2011	2012	2011	2012	2011
Berlin	11.42	14.80	71.05	48.00	82.47	62.80
Hannover	472.88	512.26	0.64	1.38	473.52	513.64
Munich	414.00	500.00	456.00	337.00	870.00	837.00
Total	**898.30**	**1,027.06**	**527.69**	**386.38**	**1,425.99**	**1,413.44**

* not including building waste

At MTU, waste accumulation varies according to workload. The main sources of harmful waste are electroplating, waste water treatment and, to a lesser degree, other production processes. The volume of harmful waste has a direct correlation with the volume of production. Just over 82 percent of the waste we generated at our production facilities in 2012 was recycled as reusable materials or as heating energy.

MTU invested in a new logistics building in Hannover, reducing the distance parts have to travel from 15 kilometers to 75 meters.

“We encourage a positive corporate culture. We want our responsible human resources policy to make jobs attractive for our employees and to provide them with an environment that values each person’s contribution.”

Gudrun Bauer

Corporate Responsibility Coordinator and Human Resources policy speaker at MTU in Munich

4 Responsibility toward employees

4.1 Management approach

An essential condition for remaining competitive and realizing our growth strategy is having motivated, well-trained and healthy employees. MTU employs some 8,500 people worldwide and it is precisely their expertise and commitment that helps shape the success of our high-tech company and allows us to lead the aviation sector in technology development. MTU positions itself as an attractive employer not only to safeguard existing knowledge and talent, but also to attract new recruits. Having established ourselves as one of Germany's top employers does not mean we can afford to become complacent: We take a long-term approach to human resources policy and continuously revise and develop what we offer our employees. Building on legally binding employment contracts, we provide secure and attractive employment, above-average and performance-related compensation, combined with numerous work options that help our employees balance their professional and family commitments. We also provide the requisite technical training, placing particular emphasis on safeguarding the company's store of valuable know-how through responsible investment in the future workforce and systematic knowledge management
> Read more about education and training on p.52.

Diversity and equal opportunity are given high priority–especially when it comes to recruiting more women–and we actively support the necessary conditions through various measures.
> Read more about diversity & equal opportunities on p. 54.

A further goal is to promote workplace health among our employees.

MTU employees in Germany
LA1

2012	2011	2010
7,248	7,047	6,907

Total workforce at MTU sites in Germany at year's end. The number of employees at all the company's sites in Germany has risen over the past three years. Safeguarding our workforce in the long term is essential to securing our technological leadership and the know-how on which it is based.

Fair working conditions
As a responsible employer, MTU creates fair working conditions for its employees, which includes respecting their rights and guaranteeing their freedom of association. Our staff are employed in line with sector-specific collective bargaining agreements. In Germany, we are bound by the regional collective agreements of the metal industry and the terms of our employment contracts comply with the relevant legislation and supplementary internal agreements. Fair and appropriate remuneration is ensured by a uniform, transparent and consistent compensation structure. Compensation for senior managers is linked to the company's long-term performance. MTU enables its employees to participate in the company's success through various profit-sharing schemes, such as employee stock options.

In accordance with the German Works Constitution Act (Betriebsverfassungsgesetz), each of MTU's sites in Germany has a works council. These sites represent the vast majority of the MTU workforce; 7,248 out of the 8,541 MTU employees worldwide were working in Germany at the end of 2012. Employer representatives work closely together with the works councils, maintaining an open, trust-based dialog. Together they negotiate works agreements that establish a legal framework under which employment conditions are defined. The resulting collective agreements apply to the entire MTU workforce in Germany, with the exception of the Board of Management and the top two tiers of senior management (OFK and FK). OFK and FK have their own representative body.

MTU also provides other supplementary benefits, including company-funded pension plans. In 2012, the company made social contributions totaling 90.8 million euros. The scope of these contributions takes in the company's own range of employment benefits in addition to all statutory requirements.

In keeping with fair working conditions, we resolutely oppose all forms of forced labor and child labor, and all other abuses of human rights.
> Read more about MTU's ethical principles on p. 11.

We place great importance on occupational health and safety, which is reflected in our integrated management system that ensures all our sites in Germany are certified in accordance with OHSAS 18001.
> Read more on occupational safety on p. 48.

Our commitments:
- UN Global Compact
- Charter of Diversity

Established human resources policy
The chief financial officer and director of labor relations is responsible for issues relating to employment. Human Resources sets policy that is in line with our overall corporate goals and long-term growth targets for each year that form part of MTU's corporate strategy. The Board of Management receives regular updates on how human resources policy is being implemented. The HR department, the specialist departments, and MTU management in particular are required to ensure policy is implemented effectively. All managers undergo performance reviews based on achievement of their personal targets. Leadership style is shaped by the leadership guidelines set out in the MTU Competences, a set of six competences derived from the MTU Principles. Managers are responsible for ensuring that company work agreements are adhered to in real terms in the work carried out by their departments, and they receive support through an extensive range of management training programs and communication forums. Defined by employment law and internal agreements, the formal framework of guidelines is subject to regular internal audits performed by the quality department.

MTU pursues various approaches towards maintaining diversity in the workforce.

Part of personnel controlling involves reconciling the goals we set with what we achieve. Delving deeper in 2012, we began the process of collecting key data on staff training, including what training we offer, and the number and cost of training days per employee.

To evaluate our performance, we regularly participate in audits and certifications, including:

- Germany's TOP employers
- Work and Family audit
- trendence Graduate Barometer
- Universum Ranking
- Chief Learning Officer

More on awards at
www.mtu.de > career > awards

A contented workforce

At its three sites in Germany, MTU carries out employee surveys at regular intervals to obtain an up-to-date picture of prevailing opinions concerning motivation, leadership, information and communication, efficiency and continuous improvement. This survey serves as a key tool towards the further development of our corporate culture, giving employees the opportunity to help shape their own working environment through their feedback to management. 76 percent of MTU employees took part in the most recent survey, conducted in 2012, and improvements were recorded in ten out of eleven survey categories compared to results from 2010. Overall results show that employees and managers alike place great trust in the company's executive management, identify closely with our corporate goals and the MTU Principles, and are very satisfied with MTU as an employer. The vast majority of employees expect the company to continue to develop in a positive manner in future.

Award

MTU was ranked as one of Germany's top employers for the seventh consecutive year.

MTU employees (Germany) at the end of 2012

LA1, LA13

	Munich	Hannover	Berlin	Total
Core workforce*	89.7	80.7	74.9	
Employees on temporary contracts*	0.6	8.2	9.8	3.5
Apprentices*	3.4	6.0	7.6	4.5
Students on work experience/ Holiday staff*	2.2	1.8	5.3	3.1
Interns, degree candidates and doctoral candidates*	3.6	3.1	2.3	2.6
Employees on temporary part-time contracts, on parental leave*	0.4	0.2	0.1	0.3
Marginal workers *	0.0	0.1	0.0	0.0
Total workforce	**4,640.0**	**1,810.0**	**798.0**	**7,248.0**
Part-time workers*	7.3	3.6	5.8	6.2
Regional distribution*	64.0	25.0	11.0	100
Women*	14.3	10.7	16.5	13.8

* percentage of the total workforce

The total workforce does not include temporary agency workers, external employees or members of the German armed forces under cooperative model assignment. The proportion of temporary agency workers, which includes cooperative model employees, is less than 10 percent for the whole of Germany. The figures presented here are those for MTU's sites in Germany–Munich, Hannover and Berlin–as of December 31, 2012. The percentage of female employees given relates to the total workforce. Information concerning the percentage of female employees categorized by type of employment and contract is regarded as confidential.

We attract our next generation of employees with quality jobs and apprenticeships in a challenging high-tech environment

4.2 Occupational safety

MTU places high value on occupational safety. It is one of the pillars of the company's social responsibility and forms part of the MTU Principles and Code of Conduct. As an aviation company, we not only place the highest demands on the quality and reliability of our products, but also on the processes and methods we use to safely manufacture and maintain them. This is assured through a comprehensive set of occupational safety activities, including training in safety and first aid, and through workplace risk assessment. All workstations are inspected and evaluated in terms of existing risks and hazards. This is done prior to their being used for the first time, and repeatedly at regular intervals (at least once a year or when changes are made). Technical solutions are the favored approach taken in minimizing discernible risks and hazards. At MTU, we adhere to the maxim that employees must not be exposed to any hazards or encumbrances that may adversely affect their health or safety in the performance of their duties.

National occupational safety regulations and standards are observed as a matter of course in maintaining a safe working environment. Our management system, which clearly specifies all applicable measures, goals and responsibilities, is certified according to OHSAS 18001 (Occupational Health and Safety Assessment Series). The system is audited by external inspectors each year and is recertified every three years. . In principle, one person at each location is entrusted with overall responsibility for occupational safety–for our headquarters in Munich, this duty is assigned to the chief operating officer; at Hannover and Ludwigsfelde, to the respective CEO. The total workforce at our sites in Germany is fully represented by our occupational safety committees.

Our obligation to protect our employees is reflected in our sustained and determined efforts to prevent accidents. Information campaigns and accident analyses help us to keep our accident rate at a consistently low level. Zero accidents remains our long-term goal. An occupational safety campaign was launched at the Munich site in 2012 to make people more aware of possible dangers confronted on stairways and how to avoid falls, as incidents of this type accounted for 40 percent of days lost due to accidents. In the course of the campaign, using stairs was made safer by measures such as marking the top and bottom steps and, where necessary, adding a second hand rail.

Occupational safety is one of the pillars of social responsibility at MTU.

Our management systems and occupational safety certifications:

- Munich: OHSAS 18001:2007, GQA Certificate
- Hannover: OHSAS 18001:2007
- Berlin: OHSAS 18001:2007
- Integrated Management System (IMS) for quality, occupational safety and environmental protection at all MTU sites

Occupational safety at MTU sites in Germany

LA7

	Munich		Hannover		Berlin	
	2012	2011	2012	2011	2012	2011
Reportable workplace accidents	14	14	6	1	4	6
Reportable commuting accidents	16	21	9	3	3	6
Fatal industrial accidents	0	0	0	0	0	0
Days lost resulting from reportable* workplace accidents	481	529	286	34	40	127
Health rate in %	95.0	95.3	94.2	94.5	95.0	95.5
Lost time injury rate (total accidents per 1 million hours worked)	2.8	2.4	3.8	0.6	3.2	5.2

The figures given are for the active workforce (core workforce + temporary workers).
* Accidents with more than 3 days lost.

In order to protect personal data, no further statistical analysis is carried out concerning accidents and days lost. Further distinctions based on such factors as gender is therefore neither possible nor intended.
MTU is not aware of how many applications have been made and accepted which classify an illness as being of occupational origin. As in the past, there were no fatal workplace accidents at MTU in 2012.

MTU not only places great value on product quality but also on the safety of manufacturing and repair processes.

Health protection

Sustainable workplace health promotion is a focus of HR work at MTU.

MTU's health promotion comprises numerous initiatives, including a health service for employees.

4.3 Health management

MTU sustainably supports workplace health in numerous ways, including its own health service, social counseling, or company fitness center. Company physicians are also on hand for employees working at MTU headquarters in Munich. In 2011, we embarked upon establishing comprehensive health management for all our sites in Germany. Closely linked to our corporate goals, health management is a human resources priority and one that we continued to expand in 2012. Involving the collaboration of the company health service, human resources department and occupational safety personnel, our health management program tackles important health topics across all sites in Germany.

The following concerns are at the heart of our efforts to maintain and boost our employees' well-being and health in the workplace, as well as to guard against potential health risks:

- Continuously improve working conditions,
- help employees to acquire and develop skills and expertise, and
- promote active participation in events and programs geared toward health and preventive healthcare.

MTU aims to raise awareness among managers and employees of the importance of healthy behavior and to support relevant practices in and outside the workplace. As part of the company's heath management program, our employees in Germany can take advantage of a wide range of offers covering various health issues. Employees and managers are called upon to actively participate in these activities. The company feels validated in its efforts to improve employee health as these have met with a positive and growing response from the workforce.

Targeted health promotion has contributed to our maintaining a constant health rate despite an aging workforce. Moreover, it has raised awareness of health-related issues among employees.

Outlook

The health management program is to be expanded progressively in future to embrace further locations in other countries. This internationalization is scheduled to begin in 2014. In the Group-wide strategy, special focus is to be placed on the site and country-specific challenges pertaining to how workplaces can meet health needs well into the future, as well as on the health-oriented supervision of employees.

A brief summary of selected health management activities in 2012:

Extended risk assessment

Although employers in Germany are required by law to assess the work carried out by employees in terms of the risks associated with the need to protect employee health, their efforts to date have generally been limited to physical stresses in the workplace. The number and duration of illnesses related to mental health issues, however, have been on the rise for years. MTU is taking this development seriously. At our sites in Germany, we offer social counseling for psychological and interpersonal issues arising in the workplace. In the reporting year, we also extended our systematic risk assessment of workplaces to incorporate psychological factors. For this purpose, we are testing a newly defined standard procedure for evaluating psychologically stressful working conditions. Together with scientists from the University of Potsdam and occupational safety personnel, our HR departments are systematically inspecting and evaluating different production and administration workspaces, using a screening manual to evaluate potential risks. The results are then discussed and reviewed with the employees from the workplace in question. The responsible managers use these results to develop the appropriate measures and ensure that they are implemented. In 2012 we launched this scheme with seven pilot projects at Hannover and Ludwigsfelde. Munich is expected to take part from 2013. We will then determine whether or not the concept is to be rolled out at other sites as well.

Health Days

Combining educational talks by experts and practical exercises performed in small groups, these events generally cover topics such as healthy eating, keeping active, and coping with stress. The program got underway at two centers at Munich in summer 2012. At our Berlin and Hannover sites, Health Days were organized in the year for apprentices and students from the University of Cooperative Education. A program specially tailored to young participants included topics such as healthy eating, keeping active, road safety, mobbing and preventing addiction.

Health Days aim to raise employees' awareness of health issues and to highlight existing MTU facilities and programs, as well as draw attention to the company's health center and in-house sports association. Participants also receive helpful advice on how they can stay healthy even by doing brief exercise routines in the workplace. These exercises are performed at special stations tailored to the requirements of the specific department or the tasks most commonly performed there. Participants also have the chance to delve deeper by getting individual nutrition advice or taking courses in the MTU health center.

During the reporting year, MTU collaborated with Audi's company health insurer Audi BKK to organize action days on the topic of coronary health for all employees from the Munich site and the Erding facility. Heart attacks and other circulatory disorders continue to pose the biggest risk to health. Kickoff was timed to coincide with the German Heart Foundation's nationwide "Heart Weeks" initiative. Employees took up the offer of having their personal risk over the next ten years rated according to scientifically validated factors. Health Days are to be continued in 2013 and subsequent years and expanded to other centers and departments.

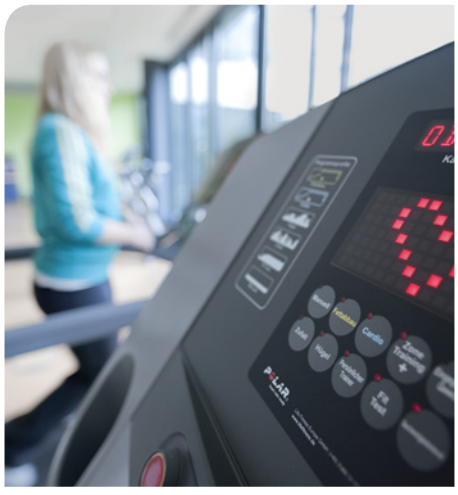
Vibration training
Building on the positive results from the 2011 pilot project, MTU expanded vibration training in the workplace at the Munich site throughout 2012. Vibration training is a personalized fitness program for efficient muscle building that takes place near the workplace and, starting in 2013, is to be available to all employees at MTU headquarters.

Outlook
2013 also saw the start of a scientific study into vibration training. The project, the only one of its kind in Germany, is being analyzed by a team from the Ludwig-Maximilians-Universität München (LMU). The team is evaluating the training results from 100 voluntary participants aged 45 and over, and is investigating in particular its effects on the musculoskeletal system and on quality of life.

Active break
Since 2012, MTU personnel taking part in long meetings or conferences have had the option of taking an active break. Under the guidance of a trainer, participants perform simple stretches and exercises that have been shown to boost concentration. Posters showing simple exercises, displayed in meeting rooms, enable participants to take real active breaks even without a trainer.

As part of its health management program, MTU promotes active participation in health and preventive healthcare events and programs.

Healthy eating
MTU helps its employees to achieve and maintain a healthy diet and every employee has the opportunity to obtain dietary advice from the company medical officer's surgery. In 2012, the company restaurant at the Munich site started offering a "light meal" as one of its three daily main course options. These meals are low in fat and calories and are nutritionally balanced, with an emphasis on food that is freshly prepared and not overly processed. The menus at MTU's second-largest location, Hannover, have also featured healthier meals since the appointment of a new caterer.

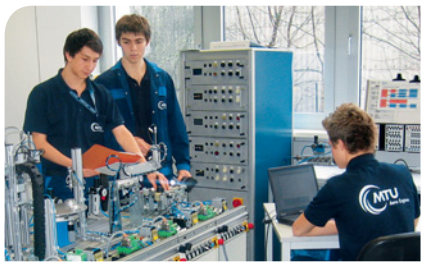


A health center is located right next to the Munich site.

Since 2012, there has been a "light meal" option on the menu every day at the company restaurant in Munich.

4.4 Staff training, education and development

By investing in the training of new recruits, we are investing in the future of our company. Vocational training is accorded a high priority at MTU, where apprentices made up 4.5 percent of the workforce in 2012. At year's end, 328 apprentices were employed at the company's sites in Germany. In keeping with MTU's adopted wider responsibilities as an employer, we aim to provide apprentices with comprehensive training, covering all technical, social, and ecological aspects of their work. In 2012, MTU headquarters in Munich hosted its tenth Environment Day for apprentices. All apprentices who successfully complete their training are offered a permanent contract with MTU. We review our training programs and evaluate the content of our vocational training courses and dual study programs at regular intervals in order to keep them aligned with the company's needs. In 2012, this led to the creation of two new advanced training courses: IT networks and software engineering, and a course in production and management techniques for mechanical engineers. Industrial management, on the other hand, is no longer offered on the curriculum. MTU's dual-study program has been increased from 12 to 14 participants. An increasing need for warehouse managers has added a new vocational training course for specialized logistics staff to the curriculum. The number of apprenticeships offered in industrial mechanics has risen from 25 to 33 to meet the requirements of the new blisk manufacturing hall 077 at our Munich site.



All apprentices who successfully complete their programs are offered a permanent contract at MTU.

Training at MTU in Germany

Apprentices*/Percentage of apprentices**

2012	2011	2010
328	321	325
4.5	5	5.1

* at year's end
** Percentage of core workforce

MTU takes part in numerous initiatives and educational projects designed to get children and young adults interested in technology from an early age and to introduce them to technical careers:

Training Night: An annual company event providing information to schoolchildren interested in training opportunities at MTU.

Science Exhibition in Hannover (IdeenExpo Hannover): An event where schoolchildren and young adults experience science and technology and find out about associated careers.

Nature and Technology Days: MTU takes part in special events organized by the company's partner schools.

Teachers in Industry: A program sponsored by the Bavarian Ministry of Culture and the educational institute Bildungswerk der bayerischen Wirtschaft, in which teachers spend one year on the staff of participating companies.

Long Night of Museums: The MTU Museum in Munich opens its doors to the public on the night of this event and on three or four other occasions during the year.

We place special emphasis on recruiting women and continuing the enhancement of opportunities offered to them as school pupils and trainees, for instance with **Girls' Days** or the **Research Camp for Girls**.
> Read more about this topic under Diversity on p. 54.

MTU is particularly active in fostering female talent, with a variety of initiatives and models providing support and encouragement.

Knowledge management
At MTU, we make it a priority to offer our employees a wide range of opportunities and avenues for personal development. Our long-running “campus” framework of staff training and career programs systematically covers all levels of employee development. Campus stands for learning and continuous further development, and all employees can access the campus course schedule via the MTU intranet.

MTU’s age structure, coupled with Germany’s shifting demographics, highlights the importance of knowledge management. This extends not only to top positions within the company or to individual specialists, but to a broad spectrum of posts in which MTU-specific knowledge must be safeguarded. By continuously developing systems and methods we are responding in a timely manner to this demographic shift. Our innovative work concepts ensure that key expertise is shared among employees of different generations, while also offering new models enabling the transition from work to retirement, such as part-time positions for older employees.

Valuable know-how is retained in the company by means of a knowledge management system.

Staff training at MTU sites in Germany
LA10

Training days total		Training days per employee		Overall training costs* in euros (millions)	
2012	2011	2012	2011	2012	2011
23,801	21,141	3.4	3	4.2	3.9

* not including travel costs

MTU assumes the costs of continued training measures.
In accordance with relevant works agreement, supervisors are compelled to conduct an annual training and development interview with each member of their staff.

Knowledge management strategy involves giving managers the support they need to identify which positions within their departments are of particular importance. Such positions are characterized by expertise that is unique to MTU, and by empirical knowledge built up over many years. Various measures designed to safeguard the wealth of MTU know-how have been introduced, such as a know-how buddy system and knowledge maps that help direct the exchange of expertise.

For several years now, MTU has also been pooling its know-how and storing it in electronic wikis. By 2012, a total of 35 wikis had been created covering the various business activities of the company.

Management culture
At MTU, we expect our managers to be role models and we support and advise them on how best to set the tone for employee conduct. Managers bear special responsibility within the company and embody corporate culture. In 2012, we designed a new feedback instrument—180-degree feedback—which for the first time gives managers at all levels and throughout the company valuable insights into their roles and opportunities for further development. 180-degree feedback is based on leadership guidelines that are derived from the MTU Competences. Compliance with these six competences is assessed by the managers themselves, the employees in their charge, and by the manager’s direct superior. Subsequent measures are agreed in a personal interview with the HR department’s career advisors. Participation in the feedback process is voluntary and anonymous. The results are evaluated by an independent consulting firm.

Further input for measures to improve the company’s management culture is gathered through our employee satisfaction surveys, the most recent of which was conducted in 2012 at the company’s sites in Germany. Relevant issues are followed up in discussion workshops by members of the Board of Management and management personnel, and in team meetings in the individual business units.

4.5 Diversity

Achieving diversity within the company means integrating employees of all ages, men and women alike, of many different nationalities and cultural backgrounds, and including those with disabilities. We place particular emphasis on promoting the advancement of women in technical professions. Providing equal opportunities within a diversified workforce gives high-tech companies such as MTU a distinct competitive edge and assures their innovative power.

MTU promotes a work environment that values each person's contribution and provides a wide range of career opportunities for new recruits and existing employees. We offer interesting jobs and flexible working-time arrangements. In 2010, MTU signed the "Charter of Diversity", a joint initiative of the German government and industry, further underpinning its commitment to diversity and equal opportunities. By signing the charter, companies accept the obligation to create a working environment free of discrimination that recognizes and supports the potential of each and every member of the workforce.

In order to promote a corporate culture of openness, tolerance and diversity of opinion in everyday working life, we have established the MTU Principles to serve as a values framework for employees, managers, executives and board members. The company has also introduced a guideline on cooperative and fair conduct, in which the company undertakes to prohibit mobbing, sexual harassment and discrimination and to take appropriate action against infringements. The company follows a standard procedure in dealing with any suspected breach of our Code of Conduct or internal guidelines and has established a compliance office in accordance with statutory requirements. In 2012, no complaints that would constitute a breach of the General Equal Treatment Act (Allgemeines Gleichbehandlungsgesetz) were lodged. Any suspected instances of illegal activity can be reported in confidence to an assigned ombudsman.

Diversity pays off

Studies have proved that mixed teams collaborate more efficiently, generate more creative ideas, and produce more successful results, because this approach multiplies individual strengths and compensates for individual weaknesses. People of more than 100 nationalities work together in harmony at MTU locations around the world. A buddy system, in which new recruits are paired up with more experienced colleagues, provides a means of transferring knowledge from one generation to the next and ensures that essential skills are maintained. This is of particular importance for a technology company and innovator such as MTU. In a time of demographic change, diversity also serves to assure the availability of experts in the years ahead. Making sure each and every employee can work effectively is important to us and this includes the integration of employees with disabilities. In 2012, employees with disabilities at MTU's sites in Germany accounted for 5.77 percent of staff in Munich, 4.28 percent in Hannover, and 2.65 percent in Berlin. Keeping all our employees healthy and able to work is a key part of expanding specialist and technical knowledge as well as of strengthening each individual's interpersonal and social skills.

Employees categorized by age group, sites in Germany 2012

LA13

Age group	Percentage of the core workforce
< 30 year olds	13.8
30-50 year olds	53.6
> 50 year olds	32.6

Mixed teams collaborate more efficiently and successfully and generate more creative ideas.

Different abilities, strengths, and opinions all make a valuable contribution.

Since 2012, MTU has implemented a special program for supporting the career advancement of women to specialist and management positions.

Gender Diversity

Within the issue of diversity, MTU strongly believes in leveling the playing field for men and women, and supports career advancement measures aimed at getting more women into specialized and management positions. Women currently make up 13.8 percent of the MTU workforce, which means there is still considerable potential to tap the resources they could provide to our business and to innovation. The company has therefore set itself the objective of increasing the proportion of women in its workforce, and particularly in management positions, to 15 percent by the end of 2015. This has been incorporated into our corporate objectives, and each business unit is responsible for reaching its own specific targets.

The newly established career advancement program for women that began in 2012 continues through an extensive range of targeted measures. The main focus of these efforts lies in persuading more high-potential women to join MTU and providing women employees with career planning advice and support throughout their professional lives. Other measures include widening the range of options designed to help employees balance their professional and family commitments by enabling them to work more flexible hours, and organizing seminars to raise awareness of gender diversity issues within the workforce as a whole.

One key measure involves a two-day seminar that offers personal career advice to women with high potential and helps them determine where they ideally should work. Candidates are asked to evaluate their individual talents, strengths and development potential and reflect on how these tie in with their professional ambitions. Working in small groups, the candidates for specialist and management positions discuss the various roles and gender-specific differences they are likely to encounter within organizations. This new program has been met with a very positive response, and is likely to be expanded.

Percentage of female employees, MTU in Germany

LA13

2012	2011	2010
13.8	13.1	13.0

Percentage of the total workforce at year's end.

Gender diversity also applies to our corporate management: both the Board of Management and the Supervisory Board are to have more seats held by women. The Supervisory Board is to have at least two female members—one employee representative and one shareholder representative. The Supervisory Board has derived this target from the existing proportion of women throughout the company, and has also committed itself to ensuring equality of opportunity in its appointments to the Board of Management through an appropriate proportion of women over the longer term.

more on the composition of the Board of Management and the Supervisory Board at
www.mtu.de > the company > corporate structure

MTU is involved in numerous programs and initiatives promoting the advancement of women:

Munich Memorandum for Women in Management. MTU was one of the original signatories to this initiative, which aims to establish more women in leadership positions in order to achieve mixed leadership in businesses and organizations.

Cross Mentoring. MTU has participated in this annually renewed program organized by the City of Munich since 2003. At the heart of this program, designed to support a new generation of female managers, is the exchange of experience and know-how between mentees and mentors from different companies. In 2012, two mentees and two mentors from MTU took part in the program.

MTU Studienstiftung. This non-profit foundation offers workshops and personal counseling to help young women studying for vocational and university qualifications in various scientific and engineering disciplines to succeed in their chosen careers.

Girls' Day. By opening their doors to female school students during this annual open day, the various MTU sites in Germany aim to stimulate the girls' interest in pursuing a career in a technical profession. MTU has participated in this nationwide event every year since 2002.

MTU has set itself the goal of having more women in management roles.

Percentage of women in management positions at MTU sites in Germany in 2012
LA13

	Munich	Hannover	Berlin	Total
Managers	**587**	**134**	**45**	**766**
Male managers*	91	95	88	91
Female managers*	9	4	11	8
Supervisors*	0	36	33	23
Male supervisors*	0	98	100	66
Female supervisors*	0	2	0	1
Extended management* (EFK)	82	47	44	58
Male EFK*	91	92	90	91
Female EFK*	9	8	10	9
Tier 2 senior managers (FK)*	15	14	20	16
Male FK*	93	100	67	87
Female FK*	7	0	33	13
Tier 1 senior managers (OFK)*	3	3	2	3
Male OFK*	94	100	100	98
Female OFK*	6	0	0	2
Board members*	1	0	0	0
Male board members*	100	0	0	100
Female board members*	0	0	0	0

* figures given in percentages

Supervisors at the Munich site count as senior management and are therefore listed separately.

MTU aims to strengthen its position as an attractive employer for future engineering specialists, placing special emphasis on the upcoming generation of women engineers. Having repositioned MTU's standing as an employer brand, we have been able to alter outside perceptions of the company, allowing us to address women more specifically and gain their attention as an interesting employer. This successful strategy led to our attracting a significantly higher number of women applicants in 2012 and increased the proportion of women recruited from 14 to 24 percent. This development is reflected in the company's improved ranking in the influential Universum Young Professionals study published in the German business journal "Wirtschaftswoche", where MTU was voted by women engineers into 21st place in 2012 after ranking 44th in the previous year.

Research Camp for Girls. Aimed at girls with an interest in technology, this project is organized jointly by a group of private companies in association with the training centers of the Bavarian employers' association (BBW) and the Munich University of Applied Sciences. MTU has been participating in the project since 2007, and in 2012 this occasion gave 15 young women a taste of the varied professional opportunities available to women engineers.

Cultural diversity
For a company such as MTU, with activities spanning the entire globe, effective cooperation between international locations is essential. This in no small part rests on the networking skills of prospective managers. For this purpose we established the Building on Talent (BOT) program at the company's sites in Germany. Cultural diversity is a key success factor for any company and international understanding is especially important for an engine manufacturer, since development, production and maintenance activities take place in a global market context that involves collaboration with international partners. We offer training in intercultural skills and encourage employees to spend time working abroad. Around 60 MTU employees across all levels of the hierarchy are currently on assignment in another country. Trainees, too, can opt to spend part of their period of training at one of MTU's international locations.

Outlook
In 2012, MTU's human resources department made Building on Talent available as an international development program with tuition in English. The participants are young employees from the MTU locations in Canada, Poland, the United States, and China, selected on the basis of their potential as future members of extended management (EFK). For MTU, the international dimension of the BOT program makes it the ideal platform for anchoring a shared understanding of leadership across our locations, whatever their size or area of business, and in all regions. It also encourages the exchange of ideas among people of different nationalities and cultural backgrounds.

MTU does not pursue a uniform policy governing the hiring of local workers. The vast majority of employees at each site come from the surrounding area and we employ local managers wherever possible. As a high-tech company, MTU must possess specialist knowledge and innovative strength. Our success is built on the collective force of our employees' skills, knowledge, strengths and attitudes. We rely on our managers, both at local and non-local levels, to set the tone.

Work-life balance
At MTU, we are committed to helping our employees improve the balance between career and family obligations. We gained our first "Work and Family" audit certification in 2002, and these audits have been taking place at regular intervals since then. Our most recent recertification was in 2011 and we were once again credited with having a family-friendly human resources policy. MTU enhances the work-life balance of its employees in many ways. We offer over fifty different working-time models, including teleworking options, sabbaticals, part-time positions for older employees, job sharing and a flextime time corridor of 5:15 a.m. to 8:00 p.m. as well as flextime accounts for structuring and logging work time. When family is the number one priority, arrangements can be made for parental leave or for employees to care for their children or elderly relatives.

External family-service providers offer employees a comprehensive package of additional services, including debt counseling, help in finding child minders, and advice when next of kin require long-term nursing care. A women's network has also been established to promote dialog and share experience among women employees. MTU has provided financial support for the "TurBienchen" daycare center, situated next door to the company's site in Munich, ever since the center was founded over ten years ago. The "Sommerkinder" initiative was launched to help parents during the long summer vacation, when their children are not in school. In 2012, for the first time, children aged from three to 12 were able to attend this daily "summer camp" at the MTU headquarters in Munich. Another example of continuous improvement has been realized in Hannover, where a new works agreement permits more flexible teleworking arrangements.

Diversity

Employees from over 100 countries work at MTU locations worldwide.

MTU supports greater compatibility of family and working life with a variety of measures such as providing childcare places near the company grounds.

“We behave responsibly and are an important employer in the areas in which we conduct our business. We take our role in the surrounding community seriously and direct our efforts to the places where we are strongest: in training and in research collaborations with scientific institutions.”

Bernd-Michael Stürmer

Training Instructor at
MTU Berlin-Brandenburg

5 Commitment to society

5.1 Management approach

MTU views itself as a corporate citizen, a company that takes an active role in the societies within which it conducts its business. This leads us to accept particular responsibility for the common good, as stated in the MTU Principles: “MTU acknowledges its social responsibility outside of the company.” We place particular importance in this regard on ensuring that we comply with applicable laws and regulations in all our business activities. Employees subscribe to a binding Code of Conduct that sets down the ethical principles we consider it our duty to uphold, and these serve as an important foundation for minimizing the risk of corruption within the company.
> For more on the Code of Conduct, see p. 11.

Compliance Board at MTU additionally acts to clear up, and preferably prevent, any cases of corruption.
> For more on Compliance Board activities and responsibilities, see p. 17.

Our Code of Conduct also establishes rules governing our relationships with competitors and business partners. MTU complies with all applicable commercial and anti-trust laws, as well as the relevant regulations on pricing, competition and consumer protection.

At MTU’s sites in Munich, Hannover and Berlin-Brandenburg, the company is a key employer and provider of training in the region. This is exemplary of the responsibility we take toward society, as formulated in the MTU Principles: “We offer attractive jobs and training positions within a fast-paced, high-tech company, with innovative working arrangements that promote a healthy work-life balance.” We benefit from a diverse workforce and aim to have women account for 15 percent of personnel across the company by 2015. At 5 percent, the number of trainees within the company has traditionally been high—and we offer all our trainees a permanent job once they have completed their apprenticeships. We opt for long-term working arrangements and are always striving to develop our sites, whether it is investing in new equipment for our production facilities or to qualify our staff.
> > For more information refer to the chapter on “Our responsibility for employees”

Research and training assume a particularly prominent role in our activities. As a high-tech company active in a high-tech sector, we depend on maintaining a continuing dialog with the scientific community and on harnessing the latest research developments. And it is in our activities relating to this core business that we do the most to help advance our society. Our active pursuit of research collaborations takes high priority on our agenda of key sustainability topics, and at the same time strengthens our contact with potential new recruits. We maintain numerous close partnerships with universities and research institutions, and have founded competence centers across Germany, each with their own area of specialization.
> For more information refer to the Research & Training section of this chapter.

In good company
We use the resources available to us to do what we can to serve the community and help our neighbors at MTU sites. MTU supports clubs, organizations and institutions both locally and regionally, working to promote them, sponsor them, and give them access to a network of contacts. This contribution is geared toward the long term and includes our employees’ corporate volunteering activities. We actively seek out dialog on a regional level to provide information about our activities in a transparent manner. Similarly, our collaboration with local authorities and associations is based on mutual trust. Tours of our production facilities give an insight into the company, as do regular open days that give the public an opportunity to visit our company’s museum. Visiting groups cover the whole range of stakeholders relevant to us. In 2012, our headquarters welcomed 547 tour groups, while MTU Maintenance Hannover opened its doors to the public as part of the “Long Night of Industry.” At our site in Ludwigsfelde near Berlin we are one of the three biggest companies and have had our own exhibition room at the city technology museum since 2012.

As a corporate citizen, MTU makes a contribution to society. The plant fire brigade also participates in operations outside the company grounds, for example.

Noise protection

Test rigs are fitted with sophisticated soundproofing.

2012 also saw the launch of the company's activities on selected social networking sites– giving interested members of the public another way to get in touch. Training and career opportunities both feature prominently. The stakeholder groups with which we are in regular contact also include figures in national, European and world politics. Activities are managed in compliance with existing laws and guidelines, as well as with our Code of Conduct, and we adopt a non-party-political approach.
> Learn more about the groups with which we are in contact on p. 18.

Corporate citizenship as we understand it also means protecting the environment around our sites. We make every effort to avoid any negative environmental impact on the surroundings, or at least to keep it as low as possible. We inform the public about the ecological impact of our operations through initiatives such as the environmental impact assessments published yearly for our two biggest sites in Munich and Hannover. Our engine test rigs at sites in Germany are fitted with the very latest technology to keep noise emissions as low as possible. All test rigs are fitted with sophisticated soundproofing. Once again there were no complaints from residents in 2012. We run all our engine production and maintenance facilities in accordance with the requirements imposed by our official permits. In Munich, we maintain five engine test rigs in addition to further test rigs for other components, covering a comprehensive range of testing, while in Hannover and Berlin-Brandenburg we operate test rigs for acceptance test runs following maintenance work.

MTU fulfills all legally imposed thresholds and submits regular measurements to the authorities to verify compliance. This applies equally to our intake and discharge of ground water, where frequent samples have shown that results are often well below the prescribed limits.
> For more about our strategy of environmental management in production, see p. 35ff.

MTU also has a management plan in place to cope with accidents and emergencies, ensuring maximum safety for employees and residents even in critical situations. This includes regular staff drills and instruction on what to do in case of an emergency. MTU has comprehensive fire protection measures in place and implements all legal directives on fire protection. Investments are also made in appropriate equipment for the company's production halls, which is optimized and maintained to the highest standards. In 2012 MTU began with the implementation of a new fire and alarm warning system in Munich, which saw the company invest in new fire alert systems and other fire protection improvements. Further initiatives targeting the buildings and production halls are to follow over the coming years.

5.2 Research & training

Collaborating with universities and research institutes is a mainstay of our research and development work and a clear area of priority if we are to fulfill our obligations to society. We create strategic alliances with research partners to foster the links between universities and industry and to safeguard MTU's capacity for innovation. Ultimately we are always looking to improve in the core areas of low-pressure turbines, high-pressure compressors and manufacturing processes and repair techniques. This includes new design features for increased efficiency, longer service life and reduced noise, modern production concepts for high-tech components and innovative repair processes that incomparably deepen the level at which maintenance remains an option in accordance with our "repair beats replacement" maxim. MTU has joined forces with its partners from research to set up six competence centers across Germany, each with their own research focus. In the period under review, the research network was further strengthened by collaboration with the Technische Universität Braunschweig. In 2012 the first aerospace engineering students from the university came to MTU to complete a semester of practical training–an integral part of their studies.

www.mtu.de > technologies > technologies for the future > network

In collaboration with partners, MTU set up the visionary and internationally-oriented think tank Bauhaus Luftfahrt e.V, which aims to draw up innovative approaches for developing a future air transportation system. In the period under review, MTU was active as a partner in a number of Bauhaus Luftfahrt projects, contributing its invaluable propulsion system expertise to the research effort.

The company also offers support to young scientists, above all talented young women in scientific and technical fields who are supported in their studies through the MTU foundation dedicated to this purpose. As well as financial support, the foundation offers professional and personal advice to prepare female students for their career. The Wolfgang Heilmann Prize, named after the former head of development at MTU and professor at the University of Karlsruhe, has been awarded by MTU every year since 1998 to young researchers active in the field of aircraft engines.

It is a matter of some concern to MTU that the public is informed about themes and developments in the aerospace sector in a balanced and appropriate way through good science journalism. This has led us to contribute as an industrial sponsor to the renowned Deutscher Journalistenpreis für Luft- und Raumfahrt, awarded each year to a non-specialist journalist writing on aerospace topics.

Strategic alliances: through cooperation with selected research partners, MTU fosters links between universities and industry.

Cooperation with universities and centers of competence

Centers of competence

RWTH Aachen
Compressor technology

Uni & LZ Hannover
Maintenance Repair Overhaul

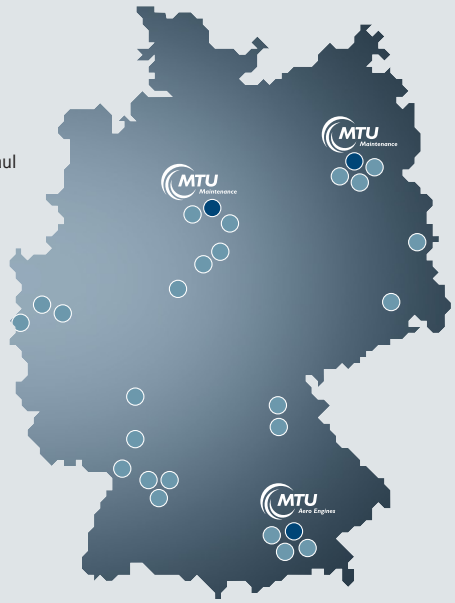
DLR Cologne
2010 plus engine

Bauhaus Luftfahrt
Munich
Future concepts

TU Munich
Structural design and production

UniBW Munich
More Electric Engine

University of Stuttgart
Turbine technology



Cooperation with universities

BAM Berlin
DLR Berlin
TU Berlin
TU Braunschweig
BTU Cottbus
TU Darmstadt
TU Dresden
Uni Erlangen
FHG Fürth
TU Göttingen
TU Hannover
TU Heidelberg
KFA Jülich
TH Karlsruhe
Uni GH Kassel
DLR Stuttgart
MPA Stuttgart

MTU is a major employer and provider of training in the regions where we are located. This is exemplary of the responsibility we take toward society.

Well-grounded training
Equal opportunities are a central part of sustainability. We are committed to providing open and equal access to training opportunities, which we believe should first and foremost provide our own young employees with a solid grounding in their chosen profession. Our investment in their comprehensive training not only covers their professional qualification but also the social issues and attitudes that contribute to their development as individuals within our corporate culture.

A company-wide project to promote a no-blame culture as an integral part of training courses at all sites in Germany was introduced in 2012. Workshops gave trainees the opportunity to learn about an open and professional approach to mistakes. Our ultimate goal is to foster an understanding and awareness of errors so as to prevent them from occurring in production operations.
> For more about the no-blame culture within the company please see chapter 1 on sustainable management p. 16.

Trainees at MTU's sites in Germany are also familiarized with the company's health management service via specific topics designed to encourage them to adopt a healthy lifestyle from the very beginning of their careers. In 2012 this took the form of special health awareness days. Social values and a sense of responsibility for the common good are instilled in the young people in a very practical way. In 2012, for instance, the trainees in Munich took part in a week of social education that included helping kindergarten children to build a knight's castle. In Hannover, trainees help out in schools and support school projects or school clubs that show a keen interest in technical ideas.

We are active in numerous education projects and initiatives focusing on children and young people—furthering an understanding of technology and sustainability in this way.
> For more on our education initiatives, see p. 52.

5.3 Corporate citizenship

MTU supports social and charitable organizations in the vicinity of its sites. They each select and carry out their work independently since familiarity with local conditions is essential to efforts that make sense in the long term. We select our projects carefully and do our own research to assure ourselves that the organization is acting strictly in the common interests of the public. Selection criteria include relevance to the aerospace sector and/or the geographical proximity to MTU sites. The projects are designed either to further the common good or to enhance the appeal of the cities where our sites are located. Local activities are approved centrally by Corporate Communications and Public Affairs. In Hannover, for instance, MTU actively supports TSV Godshorn, the local sports club, and Irene, a children's home. In Berlin-Brandenburg, MTU has supported the Potsdam "ark" project since 2012, both through financial contributions and through on-location volunteer work from employees as part of their ongoing personal development. The "ark" project is devoted to improving the lives of children.

We also offer financial support to the parent-run initiative TurBienchen e.V., a crèche just beside the MTU site in Munich that also offers childcare places to parents that do not work at MTU (at least ten percent of the children at the crèche).

Our on-site fire brigade in Munich (operated in collaboration with our neighbor MAN) and the MTU site doctor also participate in outside rescue operations in the Karlsfeld region, the city of Munich and the nearby A99 highway. Each year, MTU's fire brigade responds to some 3,000 call-outs.

We encourage our employees to get involved in volunteer work. In Munich we offer employees the chance to take part in a program in which they work in a charity for a week. Called "Social Step", the program also benefits the company, since the experience strengthens the employee's competence in interpersonal situations. It has been part of the personal development programs we offer for many years now.

Many employees make private arrangements to do charity work in their free time, and MTU gives its full support to those who have opted to take the initiative and set a good example in this way. Once again in 2012 employees from MTU's sites in Germany took part in various runs for charitable causes with the financial support of MTU. We also award our employees paid leave should they wish to participate in urgent volunteer operations such as those coordinated by the Federal Agency for Technical Relief in Germany.

Around 3,000 call-outs a year: the plant fire brigade in Munich participates in rescue operations in the city district neighboring the MTU site.

Goals and goal attainment for 2012

(based on reporting period)

Sustainable management

	Goal	Status/Deadline
Dialog with stakeholders	→ Broader communication with stakeholders via social networks	Achieved
	→ Direct e-mail contact for enquiries on sustainability	2013
	→ Stakeholder survey on sustainability communication	2014
	→ Successful completion of employee survey at German locations, initiation of work on improvements	Achieved
	→ Better access to sustainability information by means of one report with reference to GRI and UN Global Compact principles	2015
Compliance	→ Regular compliance audits to ensure business processes comply with laws and guidelines	Ongoing
	→ Employee training courses	Ongoing
Sustainability strategy and communication	→ Expansion of sustainability report to include further GRI indicators	Achieved
	→ Preparation for extending CR reporting to all of Europe	2013
	→ Successive expansion of reporting to include further foreign locations	From 2014
Supplier management	→ Mandatory code of conduct for suppliers	2014

Product responsibility

	Ziele	Status/Termin
Reduced CO_2 emissions through Clean Air Engine technology program	→ 15% reduction in CO_2 emissions through first Geared Turbofan generation	2015
	→ 20% reduction in CO_2 emissions through second Geared Turbofan generation	2025
	→ 30% reduction in CO_2 emissions through third Geared Turbofan generation	2035
Flight noise	→ 20 dB reduction in noise emissions (cumulative, measured against the ICAO's latest, most stringent 'Chapter 4' noise standard) through first Geared Turbofan generation	2035
	→ Our long-term objectives are based on the European aviation development and research industry's Strategic Research and Innovation Agenda, whose goals are: -11 dB by 2035 -15 dB (corresponds to -65%) by 2050 (both figures compared to 2000 baseline)	2050
Alternative fuels	→ Supporting the introduction of sustainable fuels with MTU engine expertise via participation in research projects, studies and practical tests	Ongoing
Product quality and safety	→ Successful completion of monitoring and recertification audits for quality management systems	Achieved

Environmental management in manufacturing

	Goal	Status/Deadline
Reducing consumption of energy and resources	→ 25% reduction in CO_2 emissions at Munich plant as part of Clean Air Industrial Site program	2020
	→ Reduction in resource consumption and CO_2 emissions from business trips through increased use of modern communication technologies such as video and phone conferencing	Ongoing
	→ Reduction in fuel consumption by company car fleet (average consumption still 7 liters100 km)	Achieved
	→ Employee training courses on sustainable resource consumption and the company's environmental activities	Ongoing
Material efficiency	→ Sustainable manufacturing concepts: introduction of series-produced components made straight from a powder bed following CAD data using new laser-based additive manufacturing techniques. This significantly reduces the amount of material used.	From 2013
	→ Development of improved materials with respect to temperature resistance and weight, leading to less fuel consumption and pollutant emissions.	Ongoing
Sustainable construction	→ Inauguration of new production hall at Munich location, with particularly energy-efficient manufacturing – reducing energy consumption to a sixth of previous levels.	Achieved
	→ Inauguration of new energy-efficient logistics building at Hannover location.	2013
Environmental certifications	→ Successful completion of monitoring and recertification audits in 2012 at all certified locations in MTU Group in accordance with ISO 14001.	Achieved
	→ Annual environmental statements for biggest locations Munich and Hannover documenting observance of EMAS requirements in accordance with Regulation (EC) No. 1221/2009 of the European Parliament.	Ongoing

Employees

	Goal	Status/Deadline
Occupational safety	→ Target: max. 24 reportable workplace accidents within MTU Group; actual: 36 reportable workplace accidents within group	67% goal attainment in 2012
	→ Launch of enhanced risk assessment with pilot projects	Achieved
	→ Extension of enhanced risk assessment to all German locations	2013/2014
	→ Continuation of occupational safety campaign with highlighted themes	Ongoing
	→ Monitoring and recertification audits to be passed in accordance with OHSAS 18001 in MTU Group insofar as locations are already certified.	Achieved
Occupational health	→ Stable health rate, implementation of health management measures	Achieved
	→ Expansion of vibration training pilot project Open offer for all employees in Munich	Achieved 2013
	→ Start of process to extend health management to foreign locations	2014
	→ Establishment of "health-oriented leadership" as priority	2014/2015
	→ Availability of back coach for ergonomic design of workplace	From 2013
	→ Collaboration with Ludwigs-Maximilians-Universität (LMU) München on vibration training for older employees (45+ project)	2013
	→ Promotion of a healthy diet	Ongoing
Diversity	→ Launch of targeted program to increase percentage of women in MTU and implementation of initial improvements	Achieved
	→ Increase in percentage of women to 15%	2015
	→ Participation in initiatives to encourage young women's interest in technology, such as Girls' Day and Research Camp for Girls	Annually
Compatibility of family and working life	→ Retaining MTU's ranking as one of Germany's "TOP Employers"	Annually
	→ Further developing employee offers: - Analyzing current situation in Hannover based on employee survey and drawing up suitable measures	2013-2014
	→ Improving the compatibility of family and working life through flexible working time models (part-time, family leave, sabbaticals) and financial support for TurBienchen daycare center in Munich	Ongoing
	→ Partner in "Sommerkinder" initiative for company-sponsored childcare during summer vacation	Achieved
	→ Offer of MTU-independent advice and placement services for family-related matters	Ongoing
Employee training and development	→ Integration of company-wide project for further promoting no-blame culture into training curricula at all German locations	Achieved
	→ New training opportunities promoting greater internationalization	2014
Continuation of current social commitment measures	→ Company suggestion scheme for implementing suggested improvements from employees	Ongoing
	→ MTU Awards for outstanding employee performance	Annually

Commitment to society

	Goal	Status/Deadline
Continuation of current social commitment measures	→ We facilitate employees in carrying out volunteering work, such as taking part in charity runs, helping out in missions by the German Federal Agency for Technical Relief, or volunteering in our Social Step program. Employees regularly bring their charitable activities into the company. Such commitment is long-term in nature and accords with our view of social responsibility. It is difficult to measure in the short term, so we have decided against having our own measurement system for this area to date.	Ongoing
Investing in future workforce	→ MTU foundation for female students in science and technology courses	Ongoing
	→ Award to support young scientists	Annually
	→ European Girls' Day at location in Poland	Annually from 2014
Sponsoring science journalism	→ Sponsoring the Deutscher Journalistenpreis für Luft- und Raumfahrt (German aerospace journalism award)	Annually

GRI Content Index • Profile

1. Strategy and Analysis

	Reported		Reference*
1.1	• •	Statement from the Board of Management	SR 2012, pp. 4-5
1.2	• •	Description of key impacts, risks, and opportunities	SR 2012, pp. 16, 64-65 AR 2012, pp. 90ff.

2. Organizational Profile

	Reported		Reference*
2.1	• •	Name of the organization	SR 2012, p. 9
2.2	• •	Primary brands, products, and/or services	AR 2012, p. 226
2.3	• •	Operational structure of the organization	AR 2012, pp. 46-47
2.4	• •	Organization's headquarters	SR 2012, p. 9
2.5.	• •	Countries where the organization operates	SR 2012, pp. 8-9
2.6	• •	Nature of ownership and legal form	AR 2012, pp. 14-15, SR 2012, p. 9
2.7	• •	Markets served	AR 2012, p. 119
2.8	• •	Company profile/Scale of the organization	SR 2012, pp. 8-9
2.9	• •	Significant changes regarding size, structure, and ownership	None
2.10	• •	Awards	AR 2012, p. 16, SR 2012, pp. 33, 47

3. Report Parameters

	Reported		Reference*
3.1	• •	Reporting period	2012, p. 7
3.2	• •	Date of most recent previous report	SR 2012, p. 6
3.3	• •	Reporting cycle	SR 2012, p. 6
3.4	• •	Contact point for questions regarding the report	Contact information on p. 3
3.5	• •	Process for defining report content	SR 2012, pp. 6, 15
3.6	• •	Boundary of the report	SR 2012, p. 7
3.7	• •	Limitations on scope of the report	SR 2012, p. 7
3.8	• •	Basis for reporting on joint ventures	SR 2012, p. 7
3.9	• •	Data measurement techniques and the bases of calculations	SR 2012, p. 7
3.10	• •	Re-statements of information	SR 2012, pp. 6-7
3.11	• •	Changes from previous reporting periods in the scope, boundary, or measurement methods	SR 2012, pp. 6-7
3.12	• •	GRI Content Index	SR 2012, pp. 66-69
3.13	• •	External assurance for the report	SR 2012, p. 7

4. Governance, Commitments, and Engagement

	Reported		Reference*
4.1	• •	Corporate governance/Governance structure	AR 2012, pp. 20ff.
4.2	• •	Independence of Chair of Supervisory Board	AR 2012, p. 22
4.3	• •	Number of members of the highest governance body that are independent	AR 2012, p. 22
4.4	• •	Co-determination right of employees and shareholders	SR 2012, pp. 18, 45
4.5	• •	Linkage between compensation for Board of Management and the organization's sustainability performance	AR 2012, pp. 25 ff.
4.6	• •	Processes in place to ensure conflicts of interest are avoided	AR 2012, p. 22, SR 2012, p. 11
4.7	• •	Qualifications of the members of the highest governance body in relation to sustainability topics	SR 2012, p. 14
4.8	• •	Statements of mission or values, codes of conduct, and principles relevant to sustainability	SR 2012, pp. 11-13
4.9	• •	Oversight of sustainability performance and risks by the Board of Management	SR 2012, p. 14
4.10	• •	Evaluating the highest governance body's own performance, particularly with respect to sustainability	AR 2012, pp. 25ff.
4.11	• •	Explanation of whether and how the precautionary approach or principle is addressed by the organization	AR 2012, pp. 90ff.
4.12	• •	Externally developed economic, environmental, and social charters, principles, or other initiatives to which the organization subscribes or endorses	SR 2012, pp. 19, 29, 36, 46, 54, 56, 61, 63
4.13	• •	Memberships in associations and advocacy organizations	SR 2012, p. 19
4.14	• •	Stakeholder groups engaged by the organization	SR 2012, pp. 18-19
4.15	• •	Basis for selection of stakeholders	SR 2012, pp. 18-19
4.16	• •	Approaches to stakeholder engagement	SR 2012, pp. 18-19, 59-60, 64
4.17	• •	How the organization incorporates and addresses queries and concerns on the part of stakeholders	SR 2012, pp. 18-19, 59-60, 64

GRI Content Index • Indicators

Economic

	Reported		Comments	Reference*
		Management approach		SR 2012, pp. 11-13
EC 1	• •	Direct economic value generated and distributed		AR 2012, pp. 110, 152, 154 SR 2012 p. 12
EC 2	• •	Financial implications of climate change		SR 2012, p. 16
EC 3	• •	Organisation's defined benefit plan obligations		SR 2012, p. 46
EC 7	• •	Local hiring and proportion of senior management hired from the local community		SR 2012, p. 57
EC 8	• •	Development and Impact of infrastructure investments and services		SR 2012, p. 63

Environmental

	Reported		Comments	Reference*
		Management approach		SR 2012, pp. 35-36
EN1	• •	Materials used by weight or volume		SR 2012, p. 42
EN 3	• •	Direct energy consumption		SR 2012, pp. 38, 40, 64
EN 4	• •	Indirect energy consumption		SR 2012, pp. 38, 40, 64
EN 5	• •	Energy savings		SR 2012, pp. 35-43
EN6	• • • •	Energy-efficient products and services		SR 2012, pp. 21-29, 32, 64
EN 8		Total water withdrawal		SR 2012, p. 41
EN16	• •	Direct and indirect greenhouse gas emissions		SR 2012, pp. 37, 64
EN18	• •	Initiatives to reduce greenhouse gas emissions and reductions achieved		SR 2012, pp. 37-40, 64
EN20	• •	NO_x, SO_x and other significant emissions	VOC emissions data for 2012 are not available for all reporting sites.	SR 2012, p. 37
EN 21	• •	Total water discharge		SR 2012, p. 41
EN 22	• •	Total weight of waste by type and disposal method		SR 2012, p. 43
EN 26	• •	Initiatives to mitigate environmental impacts of products		SR 2012, pp. 21-29, 32, 42, 64
EN28	• •	Significant fines and sanctions for non-compliance with environmental laws	none	
EN30	•	Environmental protection expenditures and investments		SR 2012, pp. 27, 36

Labor

	Reported		Comments	Reference*
		Management approach		SR 2012, pp. 45-47
LA 1	•	Total workforce by employment type, employment contract, and region		SR 2012, pp. 45, 47
LA 4	• •	Percentage of employees covered by collective bargaining agreements		SR 2012, p. 45
LA 6	• •	Percentage of total workforce represented in occupational health and safety committees		SR 2012, p. 48
LA 7	•	Rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities		SR 2012, pp. 48, 65
LA 8	• •	Education, training, counseling, prevention, and risk-control programs in relation to serious diseases		SR 2012, pp. 50-51, 65
LA10	•	Education and further training measures	Training days and costs are not broken down by gender and employment type. We consider these data confidential.	SR 2012, pp. 52-53, 65
LA11	•	Skills management and lifelong learning that support the continued employability of employees		SR 2012, p. 53
LA 13	• •	Diversity of employees and governing bodies		SR 2012, pp. 54-56

Human Rights

	Reported		Comments	Reference*
		Management approach		SR 2012, pp. 11-13, 45-47
HR 4	• •	Incidents of discrimination and corrective actions taken		SR 2012, p. 54
HR 8	• •	Percentage of security personnel trained on aspects of human rights that are relevant to operations	100% Service provider employees are also given relevant instructions.	
HR 11	• •	Number of grievances related to human rights		SR 2012, pp. 11, 54

Society

	Reported		Comments	Reference*
		Management approach		SR 2012, pp. 59-60
SO 2	• •	Business units analyzed for risks related to corruption		SR 2012, p. 17
SO 4	• •	Anti-corruption measures		SR 2012, pp. 11, 16-17
SO 5	• •	Public policy positions and participation in public policy development and lobbying		SR 2012, p. 19
SO 8	• •	Number of fines for non-compliance with laws		SR 2012, p. 17
SO 9	• •	Operations with significant potential or actual negative impacts on local communities		SR 2012, pp. 17, 19, 59-60
SO 10	• •	Prevention and mitigation measures implemented		SR 2012, pp. 17, 19, 59-60

Product Responsibility

	Reported		Comments	Reference*
		Management approach		SR 2012, pp. 21-22
PR 1	• •	Life cycle stages in which health and safety impacts of products and services are assessed		SR 2012, p. 30
PR 3	• •	Product and service information required by procedures		SR 2012, p. 30
PR 5	• •	Customer satisfaction		SR 2012, p. 33
PR 8	• •	Data protection	There were no notifiable breaches of data protection in 2012.	
PR 9	• •	Significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	none	

*SR 2012 = Sustainability Report 2012
AR 2012 = Annual Report 2012

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(Page numbers refer to the print version)

• • This indicator is reported in full
• This indicator is partially reported

All core indicators are in bold.

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